FINAL ENGINEERING DESIGN REPORT

WHITMARSH LANDFILL
ANACORTES, WASHINGTON
PROJECT US0041081.0037

Prepared for:

SKAGIT COUNTY

1800 Continental Place, Mount Vernon, WA 98273-5625

MARCH 5, 2026

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TABLE OF CONTENTS

1 Introduction 1
1.1 Project Background 1
1.2 Property Ownership 1
2 Site Description 2
2.1 Site History 2
2.2 Previous Investigations 3
2.3 Zoning and Future Land Use 3
2.4 Summary of Environmental Conditions 3
3 Planned Remedial Activities 4
3.1 Pre-Design Field Investigation 4
3.2 Heronry Considerations 7
3.3 High Tide Line 8
3.4 Critical Areas Report 8
4 Remedial Actions and Basis of Design 9
4.1 Basis of Design 9
4.2 Landfill Configuration 9
4.3 Landfill Cap System 11
4.4 stormwater Water Management 12
4.5 groundwater Water Management 13
4.6 Shoreline Stabilization and Habitat Restoration 14
4.7 Construction Considerations 16
4.8 Site Restoration 16
5 Construction 16
5.1 Project Permits 17
5.2 Mobilization and Site Setup 18
5.3 Earthwork 18
5.4 Site Capping 20
5.5 Groundwater Management 21
5.6 Waste Management 22
5.7 Landscaping and Habitat 22
5.8 Health and Safety 23
5.9 Construction Quality Assurance 23
5.10 Construction Documentation 23
6 Long-Term Monitoring and Maintenance 24
6.1 Monitoring Wells and Landfill Gas Probes 24
6.2 Habitat Monitoring and Maintenance 24
6.3 Landfill Monitoring and Maintenance 26
7 References 27

LIST OF FIGURES

Figure 1 Site Vicinity
Figure 2 Parcel Boundaries
Figure 3 Site Plan
Figure 4 Exploration Locations
Figure 5 Wetlands Locations

LIST OF TABLES

Table 1 Summary of Laboratory Test Results
Table 2 Groundwater Levels
Table 3 Landfill Gas Readings
Table 4 Project Quantities
Table 5 Sectional Earthwork Volumes

LIST OF APPENDICES

Appendix A Pre-Design Investigation Information
Appendix B Heron Management Plan
Appendix C Critical Areas Report
Appendix D Design Drawings and Specifications
Appendix E Technical Information
Appendix F Wetland and Buffer Mitigation Plan
Appendix G Inadvertent Discovery Plan
Appendix H Project Permits
Appendix I Well Abandonment Work Plan
Appendix J Import Material Characterization Report
Appendix K WSP Health and Safety Plan
Appendix L Construction Quality Assurance Project Plan
Appendix M Well Installation Work Plan

LIST OF ACRONYMS

Bay	Inner Lagoon
BNSF	BNSF Railroad Company
CAP	Cleanup Action Plan
CL	clay liner
COC	contaminants of concern
CY	cubic yards
DNR	Department of Natural Resources
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
FS	Feasibility Study
GCLL	geosynthetic clay liner with a lamination
gpm	gallons per minute
HASP	Health and Safety Plan
HDPE	high-density polyethylene
HMP	Heron Management Plan
HTL	high tide line
ID	identification
LFG	landfill gas
MLLW	mean lower low water
MTCA	Model Toxic Control Act
NWP	Nationwide Permit
OHWM	ordinary high water mark
PCBs	polychlorinated biphenyls
PLP	potentially liable party
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROW	right-of-way
Site	Whitmarsh Landfill Site
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSP	WSP USA Inc.

1 INTRODUCTION

This Engineering Design Report (EDR) has been prepared by WSP USA Inc. (WSP) on behalf of Skagit County for remedial efforts for the upland properties at the March Point (Whitmarsh) Landfill Site (the Site) located at 9663 South March Point Road in Anacortes, Washington (Figure 1). The Site is listed on the Washington State Department of Ecology's (Ecology's) Hazardous Sites List as Facility Site Identification (ID) 2662. This EDR has been prepared following the requirements of a Consent Decree 21-2 00194 29 issued by Ecology on March 23, 2021, pursuant to the requirements of the Model Toxics Control Act, Revised Code of Washington 70.105D, and its implementing regulations in Chapter 173-340 of the Washington Administrative Code (WAC). The EDR presents the findings of a pre-design field investigation and describes the remedial design for the Site.

1.1 PROJECT BACKGROUND

In the 1950s, the public began the unauthorized dumping of household waste in Padilla Bay Inner Lagoon, adjacent to South March Point Road (Figure 2). In early 1960s, Skagit County began operating the area as a solid waste landfill. Initially, waste was burned at the Site, but subsequently, the operation switched to sanitary landfilling practices. The landfill was built north of the BNSF Railway Company (formerly Burlington Northern Santa Fe) railroad embankment and east–southeast toward the Swinomish Reservation. In 1973, landfill operations ceased. Skagit County closed the landfill by placing an 18-inch-thick layer of sandy soil on top, in accordance with the landfill standards in effect at that time. A sawmill was constructed and operated on the Site from the late 1980s to the early 2000s.

In the early 2000s, seeps were noted entering the Bay from the landfill. The seeps were mostly orange colored, which is indicative of high metal content. Samples of the seeps indicated the presence of landfill contaminants. Ecology identified the Site as contaminated and placed it on their Hazardous Sites List as "Facility Site ID 2662." Four potentially liable parties (PLPs) were identified and Agreed Order DE-08TCPHQ 5999 was signed between Ecology and the PLP group to conduct remedial activities and close the Site in accordance with landfill standards. During the subsequent 10 years, remedial investigations were conducted, and a feasibility study was completed for the Site and a Final Remedial Investigation/Feasibility Study (RI/FS) Report was issued in 2017 (Amec 2017). Ecology selected a remedial option that consisted of regrading the landfill to a mound and capping the Site with a low-permeability barrier, in accordance with WAC 173-340.

Amec Foster Wheeler prepared a Cleanup Action Plan (CAP) for the remediation that was issued by Ecology in 2020 (Ecology 2020). Skagit County signed a Settlement Agreement with the other PLPs to become the sole party responsible for implementing the remedial action. In March 2021, Skagit County signed Consent Decree No. 21-2 00194 29 with Ecology, identifying the remedial approach and establishing a preliminary timeline to complete the project.

1.2 PROPERTY OWNERSHIP

According to the Skagit County Assessor's Office, the Site area includes four tax parcel numbers: P19676, P19684, P19713, and P19761. The Site also includes area within the BNSF right-of-way (ROW), up to the railroad embankment along the northern boundary of the landfill. An area to the east and north of Skagit County parcels, delineated by a meander line, belongs to State of Washington Department of Natural Resources (DNR). Figure 2 shows parcel numbers and boundaries for the Site. Ownership of the four parcels is as follows:

- Skagit County owns parcels P19713 and P19676.
- The Charles Moon Credit Trust owns parcel P19684.
- Ralph Hillestead, deceased, owns parcel P19761.
- DNR owns the area waterward of the Skagit County parcels and the meander line to the Swinomish Tribe Reservation Boundary.
- A portion of the landfill is within the BNSF ROW along the north side with no parcel number.

Skagit County has obtained Access Agreements from all property owners for this project.

2 SITE DESCRIPTION

The Site is located north of South March Point Road at the base of a bluff in the tidelands area of Padilla Bay in Anacortes, Washington (Figure 2). The Site covers approximately 16.7 acres of upland and filled tidelands, and the limit of waste is estimated at approximately 15.3 acres. The BNSF railroad causeway and Padilla Bay bound the Site to the north and northeast, the Swinomish Indian Tribal Community Land to the east and southeast (Figure 2), with South March Point Road to the south. A heronry is on the south side of the road. State Highway 20 runs generally east–west about 800 feet south of the Site, beyond South March Point Road. The landfill is buttressed with heavy rock riprap along its saltwater edge to the east and northeast, which includes the BNSF ROW. The embankment under the railroad serves as a dike separating the Inner Lagoon from Padilla Bay. A short trestle (approximately 110 feet long) in the railroad embankment allows for saltwater exchange between the Inner lagoon and Padilla Bay. The Swinomish Indian Tribal Community owns the area southeast of the landfill, which has been developed as a light industrial/commercial area.

The elevation of the former Whitmarsh Landfill generally ranges from 6 to 25 feet above mean lower low water (MLLW) datum. The landfill surface is relatively flat across the top, with higher elevations on the north and west ends. The landfill slopes down to tidelands on the northeast and east sides and to drainage channels along the north and south sides. The tidelands on the northeast and east sides consist of the inner lagoon and outer lagoon, with an estuarine stream running along the eastern boundary continuing out toward Padilla Bay.

Padilla Bay is part of an ancient delta of the Skagit River that was abandoned by the river and currently has no substantial freshwater stream input. Water depths in Padilla Bay are shallow, with the bottom generally at an elevation of less than 8 feet below MLLW. Tidal fluctuation within Padilla Bay averages 8 feet and can vary from 3 feet to over 10 feet. In this document, Bay refers to the Inner Lagoon, adjacent to the landfill.

The heronry near the south end of the Site is protected by regulations and requires additional evaluation and considerations. This subject is discussed in Section 3.2.

2.1 SITE HISTORY

The Site history prior to 2016, with all references and detailed information, was presented in the RI/FS. A relevant summary is presented here. Prior to the 1950s, the Site consisted of undeveloped tidelands lying between the main Mount Vernon–Anacortes highway and the BNSF rail line. Landfilling began in the 1950s when the Site was used by the public as a convenient, unregulated dump site. In 1961, Skagit County applied for and received a lease from the state to operate the property as a landfill. The County operated the landfill as a “burn dump” and burned waste regularly until 1969 (Skagit County Health Department 1990). In 1969 or 1970, the County converted the facility to a sanitary landfill. From 1969 through 1973, the landfill was the primary solid waste disposal facility in Skagit County (Skagit County Health Department 1990). Skagit County Public Works records of waste accepted from 1970 onward indicate that waste originated from the cities of Anacortes, Burlington, La Conner, Mount Vernon, and Sedro-Woolley; rural Skagit County; Whidbey Island; and the Shell Oil Company and Texaco, Inc. refineries, among many others (GeoEngineers 2007).

Historical documents from the early 1970s indicate that a dike was intended to be built along the southeastern margin of the landfill, apparently to better contain waste within the landfill. Aerial photographs from this same period show a linear feature that extends along the current southeastern margin of the landfill, indicating that a dike may have been constructed along the current southeastern margin of the landfill.

Limited records are available regarding the composition and quantity of any potentially hazardous substances dumped at the landfill. According to the Skagit County Health Department (Ecology 1986), industrial wastes from Allied Chemical and Northwest Petrochemical were dumped at the landfill. Independently, other industrial wastes, including drummed wastes, are also alleged to have been dumped at the landfill. In 1973, Skagit County opened the Inman Landfill, and the Whitmarsh Landfill ceased operation. Closure appears to have consisted of grading the solid waste and covering it with soil.

From late 1980s until approximately 2010, the northern two-thirds of the former Whitmarsh Landfill were occupied by a cedar sawmill operated by Snow Mountain under a lease with the DNR. The former mill building foundations are shown on Figure 3. The sawmill buildings were demolished and the slabs broken up in 2022.

In 2014 and 2015, the DNR conducted a wood waste removal project to address a 2- to 10-foot-thick layer of wood waste left behind after removal of the log mill and associated equipment. The wood waste generally consisted of cedar bark, wood chips, and sawdust. WSP (formerly Amec Foster Wheeler) oversaw and monitored the removal of the wood waste by a DNR-selected contractor. Approximately 44,000 cubic yards (CY) of wood waste debris were hauled off-site and recycled as compost material; an estimated 13,000 CY of wood waste debris was mixed with rock and remains on-site. The rock content of this debris is estimated at approximately 50 percent, and most of this material is stockpiled east-southeast of the sawmill foundations, as shown on Figure 3. The rest of the residual wood waste is located near the former mill building foundation.

After this wood waste was removed, at the request of the City of Anacortes, two 3- to 4-foot-high berms were constructed on the east and west sides of the landfill to limit potential stormwater runoff. These berms were hydroseeded after construction. After construction of the berms, the surface of the landfill was resurveyed, and the current topography is shown in Figure 3. The southern third of the former Whitmarsh Landfill is unoccupied and covered with blackberry, several trees, and grass.

2.2 PREVIOUS INVESTIGATIONS

Limited site investigations were conducted from the 1980s until early 2000s. A complete RI/FS, including Phase I and Phase II investigations, was conducted between 2009 and 2012 and issued in 2014. WSP issued a final RI/FS in 2017 (Amec 2017). An archaeological investigation and a survey of the Site was conducted during the RI/FS, which found no known evidence of presence of archaeological sites. The study recommended monitoring the native sediment of the historical shoreline, where encountered in excavations during remedial activities, for the presence of archaeological artifacts. A complete description of historical investigations and findings is summarized in the RI/FS.

A CAP was prepared based on the preferred option. The final CAP was issued in 2018, which Ecology incorporated into the Consent Decree as Exhibit B.

2.3 ZONING AND FUTURE LAND USE

The Site lies within the City of Anacortes city limits and is currently zoned as “HM” or Heavy Manufacturing. WSP contacted the City’s Department of Community and Economic Development, which confirmed that there are no plans to change the zoning for the foreseeable future (City of Anacortes 2023).

2.4 SUMMARY OF ENVIRONMENTAL CONDITIONS

The environmental conditions of the soil, groundwater, seeps, surface water, sediments, and landfill gas (LFG) were discussed at length in the RI/FS Report (Amec 2017). There were no exceedances of the sediment cleanup standards associated with releases from the former Whitmarsh Landfill. However, there were exceedances of the sediment standards associated with releases from a secondary, unrelated, non-landfill source. The sediment results are discussed in the RI in Section 5.2 and Appendix B of the RI/FS.

Contaminants of concern (COC) in soil and groundwater include metals, polychlorinated biphenyls (PCBs), volatile organic compounds, semi-volatile organic compounds, total petroleum hydrocarbons, and pesticides. LFG is also present on the Site at various concentrations, mainly within the older waste deposits.

3 PLANNED REMEDIAL ACTIVITIES

The preferred option identified in the FS was to regrade the landfill into a mound to promote stormwater runoff and cover the Site with an engineered, low-permeability cap to meet the landfill standards set forth in WAC 173-340, Minimum Functional Standards for Solid Waste Handling. The cap would use a geosynthetic clay liner with a lamination (GCLL) as the low-permeability layer. This liner material was selected for its ease of installation, flexibility, ability to perform in saline environment, and low cost.

The remedial activities presented in the CAP include the following:

- Clearing the Site vegetation to allow vehicular access.
- Abandoning existing monitoring wells.
- Demolishing structures on the Site.
- Excavating any waste present west of the existing chain-link fence and placing it in the landfill.
- Regrading the landfill to flatten the landfill slopes along the inner lagoon and creating a mound in the middle of the landfill to promote stormwater runoff. During the design process, Skagit County decided to also remove all the waste from the BNSF ROW and return the area to its pre-landfill condition as mudflats.
- Extracting and treating groundwater/leachate, where encountered when regrading the edges of the landfill, and discharging it into sanitary sewer.
- Constructing an engineered, multilayer cap system with GCLL as the low-permeability layer.
- Installing a passive LFG system to vent the gases generated from waste decomposition to the atmosphere.
- Hydroseeding the Site and creating a riparian habitat by planting along the newly regraded slopes where tidal fluctuations occur.
- Installing an access road around the landfill and enclosing the Site with a 6-foot-tall chain-link fence.
- Installing pairs of groundwater monitoring wells into the shallow and deep aquifer on the landfill and LFG probes outside the landfill for long-term monitoring.

3.1 PRE-DESIGN FIELD INVESTIGATION

To develop the design, additional field investigations were proposed in the CAP (the summary of findings is discussed in Section 3.1.3). The following activities were identified to obtain recent additional information to facilitate the design effort:

- Determine extent of the landfill waste outside the existing fence and along the western segment of the stormwater swale separating the landfill from South March Point Road.
- Determine the extent and quality of the existing surface soil outside the landfill entrance for reuse.
- Test the existing soil cover for permeability and chemical suitability for potential reuse as an LFG collection layer.
- Determine the nature and extent of the original landfill southeast perimeter earthen berm.
- Determine the presence of a horizontal upgradient groundwater flow into the solid waste.
- Determine the groundwater flow for the purpose of dewatering.
- Determine the perched groundwater levels and chemistry.
- Determine the vertical hydraulic gradient through the bay mud beneath the landfill.

- Confirm LFG conditions by testing methane concentrations in selected monitoring wells or probes to verify that passive venting is still appropriate for the Site.

Two tasks identified for the pre-design investigation were eliminated. One was determining the groundwater gradient by conducting a pump test. The effort was of limited value due to the heterogeneous nature of the waste and channelized groundwater flow and the amount of precipitation at the time of the investigation compared to the actual precipitation during construction. The second eliminated task was the identification of the southeast perimeter earthen berm because it would not have changed the design.

The following three tasks were added to the scope of work:

- Mowing the Site
- Removing trees
- Demolishing structures

These tasks were planned to be completed during Site remediation. Skagit County decided to complete these tasks in advance to minimize the noise generation during remediation, when the heron breeding season occurs (mid-February through August). In addition, the objective of the investigation for soil material by test pits was expanded to include better determination of the presence of waste in the northwest area outside the landfill entrance and along the stormwater swale separating the Site from South March Point Road.

3.1.1 FIELD ACTIVITIES

A Pre-Design Field Investigation work plan was developed and approved by Ecology. The mowing, test pit investigation, groundwater monitoring wells, and LFG probe installations were completed in late September and early October 2021. A total of 13 test pits were excavated and backfilled the same day. A total of eight groundwater monitoring wells (one deep and seven shallow) and three LFG probes were installed. Figure 4 shows the exploration locations. The test pit and boring logs and laboratory reports are included in Appendix A.

3.1.1.1 Demolition

Prior to the demolition of the structures, Ecology's Water Quality Division required the project to obtain a construction stormwater discharge permit. Skagit County applied for the discharge permit and submitted a Stormwater Pollution Prevention Plan (SWPPP) to Ecology in October 2021. Ecology issued Discharge Permit No. WAR310696 for demolition of the structures.

WSP conducted a hazardous material survey on the structures and issued its findings in October 2021. Some asbestos material was identified in one of the structures. WSP's subcontractor, Welch Brothers, Inc., completed asbestos abatement in November and applied for demolition permit with the City of Anacortes. The City issued Permit No. BLD-2021-0986 on December 8, 2021, valid for a period of approximately one year.

Due to the project limitations for noise generation during the breeding season, Skagit County decided to postpone the demolition to September 2022. The miscellaneous hazardous material (fluorescent light bulbs) was removed from the structures and recycled off-site. The structures were demolished in September 2022. The metallic components of the demolition debris were recycled off-site, and the remaining debris was stockpiled on-site and covered with durable plastic sheeting for incorporation into the landfill during remediation.

The hazardous materials survey, demolition permit, and the construction stormwater discharge permit are included in Appendix A.

3.1.2 LABORATORY TESTING

Bulk soil samples of the landfill cover were collected from six test pits and submitted for grain size analysis and moisture content determination. Two rounds of groundwater sampling were conducted in late October 2021 and late January 2022. Samples collected were submitted to OnSite Analytical Laboratory in Redmond, Washington, and analyzed for the Site COCs. Also, two rounds of LFG readings were taken in late January and mid-May 2022 from the LFG probes.

3.1.3 SUMMARY OF FINDINGS

3.1.3.1 Limit of Waste

The test pit investigation better refined the limit of waste outside the Site's entrance and along its southwest area. Minor changes from the previous extent of waste were made. The revised extent of the landfill is shown in Figures 1 through 4.

3.1.3.2 Surface Soil Quality

The surface and near surface soil outside the landfill entrance was not considered for reuse above the low-permeability engineered cap due to its limited quantity. Therefore, no analysis or testing was conducted for use above the final low-permeability layer.

3.1.3.3 Surface Soil for Use as LFG Collection

Six soil samples were collected from the near surface soil from the test pits and tested for gradation. The samples were found to contain between 56.4 to 95.1 percent granular material (larger than No. 200 sieve or 0.076 millimeters). With an average sand and gravel content of 74.4 percent, the material is generally granular in nature and may be used for the LFG collection layer, if needed. The remediation contractor may elect to use this soil for another purpose below the engineered cap.

3.1.3.4 Evaluate the Southeast Berm

The extent of the southeast berm was not investigated since it would not have had any impact on the design. Monitoring Well MW-21-1 was installed within this berm. The soil samples and cuttings inspected during drilling showed the material to be granular in nature and did not contain any refuse. This material is suitable for use as an LFG collection layer.

3.1.3.5 Evaluate Upgradient Groundwater Flow into the Solid Waste

This task was not conducted during the field investigation. The original purpose of this task was intended to provide some information for the purpose of evaluating groundwater extraction. The groundwater flows into the landfill primarily from the west and will be highly dependent on the precipitation at the time of construction, and therefore, mostly unreliable. The planned construction sequence of excavating at the entrance will include placing the low-permeability material on the landfill at the entrance, which will minimize or prevent the flow of groundwater into the landfill. Furthermore, the actual flows within the excavation areas will vary widely due to the amount of precipitation and channelized flow. Therefore, it was deemed more practical to address the groundwater extraction by additional pumps, if needed. A copy of the groundwater contour lines during the RI is included in Appendix A. The groundwater elevations used in the RI used a different datum from the datum used in this design.

3.1.3.6 Evaluate Groundwater Flow for Dewatering

The original intent of this task was to conduct a pump test to determine flow rates. This task was not conducted due to its high cost and limited confidence in the information obtained. The landfill material is heterogeneous, which causes channelized groundwater flow that would not have reflected in a well pump test. The matter of groundwater extraction and rates will be determined during construction.

3.1.3.7 Groundwater Levels and Chemistry

The perched groundwater mentioned in the CAP refers to the shallow Site groundwater, which was investigated by installation of eight new monitoring wells. Groundwater depth and elevation readings were obtained from the monitoring wells in October 2021 and a subsequent event in January 2022. The groundwater levels readings are presented in Table 2. During the January 2022 sampling event, the groundwater level readings were obtained on two consecutive days. The depths to groundwater in MW-21-1 and 2 were found to be lower the second day. This suggests the groundwater recharges slower in those areas.

Groundwater samples were collected from the newly installed monitoring wells and analyzed for the COCs by OnSite Analytical Laboratory. The laboratory test reports are included in Appendix A, and a summary of the results is presented in Table 1. The groundwater chemistry information was used to design the groundwater treatment system.

3.1.3.8 Determine Vertical Groundwater Gradient

Monitoring wells MW-21-3 and MWD-21-1 were installed as a pair in the shallow and the deep aquifer, respectively. The groundwater elevations obtained indicate a downward gradient to the deep aquifer. We anticipate the gradient to reverse after completion of the construction.

3.1.3.9 LFG Levels

LFG readings were obtained in January and May 2022 and are presented in Table 3. The readings indicate the presence of LFG inside the probes; however, no readings registered on the instruments immediately outside the probe at the ground surface. It is expected that the planned passive LFG venting system will be able to vent the LFG generated and eliminate or reduce the potential for LFG migration off-site.

3.2 HERONRY CONSIDERATIONS

March Point Heronry, located south of the Whitmarsh Landfill (Figure 2) is the largest great blue heron colony in Washington. The Skagit Land Trust owns most of the property where the heronry is located. Under the City of Anacortes Municipal Code 19.75.335.2b, any development within 1,000 feet of the heronry that has the potential to impact the heronry, primarily by noise and human activities, is required to develop a management plan designed to reduce or eliminate potential impacts to the colony during their breeding season, typically from mid-February through August.

In spring and summer of 2021, WSP conducted a heronry study. The study required noise monitoring and associated biological monitoring to evaluate the birds' reaction to noise and various activities. WSP presented the findings of the study and the recommendations during construction in a Heron Management Plan (HMP). Ecology, the City of Anacortes, the Skagit Land Trust, and the U.S. Fish and Wildlife Service reviewed the plan. WSP addressed review comments and issued a response to the comments document. The City of Anacortes approved the combination of the initial plan and the response to comments document as the project's HMP, which is presented in Appendix B.

The HMP recommended the following noise reduction measures to be implemented during construction to reduce the disturbance levels:

- Conduct the perimeter construction activities in clockwise direction starting at the Site entrance so that most of the perimeter work closest to the heronry will be conducted later in or after the breeding season.
- Stage heavy equipment at points furthest from heron nesting areas.
- Implement a no-idling policy.
- Operate at a steady rate to minimize equipment power demands and reduce the associated engine revving, when possible.
- Install more efficient engine exhaust silencers.
- Apply sound dampening material and sound absorption layers to vibrating panels and covers.
- Limit run times to reduce hourly sound level averages.
- Limit the number of trips across the Site and the number of pieces of equipment running at the same time.
- Avoid tracked equipment. If tracked equipment must be used, avoid driving over surfaces that may create higher noise levels, such as concrete, pavement, and packed gravel.
- Install modified/ambient sensitive backup warning devices or use backup observers on all vehicles/heavy equipment.
- Require well-maintained bed liners for all trucks performing import/export haul. Bed liners dampen noise from materials that are loaded and unloaded from the truck bed.
- Ensure truck loading methods involve careful placement of material in the beds versus dropping the material from higher distances.
- Prohibit truck tailgate banging. All truck tailgates shall be secured to prevent excessive noise from banging.

- Locate equipment within a sound dampening enclosure.
- Locate on-site activities as far away from the heronry and heron activity (including the lagoon) as practical by scheduling activities to accommodate their breeding season patterns.
- Exclude/limit the portion of South March Point Road next to the heronry as a Site access/haul route to the extent practicable. Direct haul routes and Site traffic (workers, vendors, etc.) to/from the north and northwest, away from the portion of South March Point Road adjacent to the heronry.
- Avoid louder work activities on windy, cool, or rainy days to the extent practical.
- Prevent loud noises and refrain from large equipment moves during large vocalizations (chortles/clucks) by the herons and/or observed disturbances to the colony by predator activity (bald eagles [*Haliaeetus leucocephalus*], red-tailed hawks [*Buteo jamaicensis*], and others).
- If lighting is needed, use covered and down-shielded lights and direct away from the heronry, foraging areas, and existing trees on the Site.

A maximum allowable sustained noise level of 85 decibels at the edge of the heronry was established for the project, as the action level, above which noise mitigation measures need to be employed to lower the noise levels.

3.3 HIGH TIDE LINE

Work conducted waterward of the high tide line (HTL) is regulated under the authority of state and federal agencies. As part of the permitting process, the U.S. Army Corps of Engineers (USACE) provided guidance for determining jurisdictional lines in tidal waters. For determination of the HTL, the USACE listed information sources used by the USACE for determining the jurisdictional boundary and included physical indicators observed at the Site (ordinary high water mark [OHWM]) and the annual highest predicted tides over a 10-year period into the future.

The OHWM is a line on the shoreline where water fluctuation creates a clear impression on the bank characterized by changes in soil or vegetation and presence of litter or debris and is determined by field observations. A field survey was conducted at the Site to document shoreline conditions. Based on the field observations from the survey, the physical indicators of HTL/OHWM along the shoreline were highly variable, and a discrete/consistent OHWM was not observed. Elevations of the ordinary high water based on these characteristics ranged from approximately 8.2- to 9.4-feet MLLW. Given the variability of the field observations, the HTL was determined by using the 10-year average annual highest predicted tide elevation (10.27-feet MLLW) at the Swinomish tide gauge (ID no. 9448682).

3.4 CRITICAL AREAS REPORT

In 2021, Hamer Environmental completed a Critical Areas Report (Appendix C). The report identified two categories of wetlands: Wetland A, a freshwater Category I estuarine wetland comprising the stormwater swale along South March Point Road, and Wetland B, a saline water Category II depressional wetland comprising the Padilla Bay and lower reaches of the stormwater swale.

Both wetlands extend up to and above the HTL. Figure 5 shows the wetlands locations and extent.

4 REMEDIAL ACTIONS AND BASIS OF DESIGN

The previously proposed remedial actions stated in the CAP did not change; however, during the course of the design, Skagit County decided to remove all the waste from within the BNSF ROW. This change met the objectives of the project and was approved by Ecology, USACE, and the City of Anacortes. The final project design drawings and specifications are included in Appendix D.

4.1 BASIS OF DESIGN

The basis of design for this project includes the following:

- Eliminate presence of waste outside the current landfill entrance to the northwest.
- Remove all the waste from within the BNSF ROW and do not install any portion of the landfill cap in the ROW.
- Reduce the footprint of the landfill wherever possible.
- Do not expand the footprint of the landfill at any location.
- Minimize or prevent negative impact to the water quality of the bay during construction and after.
- Construct a low-permeability engineered cap in compliance with WAC 173-340.
- Install a passive LFG venting system.
- Construct riparian habitat along the shoreline to mitigate impact to the existing wetlands during construction.
- Secure the Site after completion of the project to prevent public access.
- Monitor the shallow and deep groundwater levels within the landfill footprint, and the presence of LFG to the west and southwest of the landfill, where human occupancy is present.
- Eliminate or minimize impact to the heronry.

4.2 LANDFILL CONFIGURATION

The objectives of the final landfill configuration are to remove all waste from outside the existing entrance and from the BNSF ROW, create new habitat on the slopes along the Bay, and create a central mound. The design of the final landfill configuration is shown on Drawings C-7 and 8.

The east slope facing the bay will be 20 percent, which is considered a stable slope along open water by Ecology (Soft Shoreline Stabilization, Ecology 2014). The north slope facing the BNSF railroad embankment will be 25 percent, since this section will be open to the bay only on one side and will experience much less erosional energy from the bay. The landfill slope on the south, along the stormwater swale, will be 33 percent. The landfill slopes above Elevation 20 feet above MLLW will flatten to 10 percent, then to 6.5 percent above Elevation 25 feet MLLW.

The planned slopes and final landfill configuration are based on balanced cut and fill planned for the project. The upper slope of the landfill above Elevation 25 feet MLLW will be adjusted during construction to accommodate quantity variations and material expansion, or fluff.

The landfill construction is planned to start at the northwest corner of the Site at the entrance and proceed clockwise to flatten the slopes and place the excavated material in the middle of the Site, building the central mound gradually over a period of about four months. The approximate time frame of excavations along the perimeter is shown on Drawing C-1.

While the final configuration will experience some post-construction movements caused by settlement and localized erosion along the Bay, it is not expected to have structural stability concerns. The relatively steep existing slopes of the landfill along the Bay will be flattened to stable slopes. The placement of additional material in the central area will cause some gradual settlement as the central mound is constructed. The underlying aquitard is known to be 10 feet thick or less (Amec 2017) and is partially consolidated in the central area by the former sawmill structures and operations and along the toe of the landfill by the existing material that will be removed. The added weight of the central mound over a distance of 150 feet or more to the toe of the landfill does not create a concern for structural slope stability.

Site excavation will include removing waste from outside of the existing landfill gate; removing all waste from within the BNSF ROW; reducing the footprint of the landfill along the swale on the south and southwest sides of the Site, wherever possible; and flattening the slopes of the landfill to 4 horizontal to 1 vertical (4H:1V) along the railroad tracks and 5H:1V along the bay. The actual extent of waste to the northwest and southwest of the landfill will be verified based on visual indicators, such as presence of refuse or other manufactured articles like rags. Within the BNSF ROW, the landfill was constructed to the limit of the railroad embankment. The configuration of the embankment was assumed to be symmetrical with the north side of the embankment facing Padilla Bay. The depth of the excavation will be to the original grade of the mudflats at approximately Elevation 5 feet MLLW, based on the previous boring logs. Portions of the mudflats may also be excavated if visual or olfactory indications of contamination, such as discoloration or odor, are noted in the exposed surface.

All excavated material outside the landfill entrance will be incorporated into the landfill and capped.

The existing soil cover on the Site varies in thickness, ranging from a few inches to approximately 3 feet. In the western portion of the Site where the sawmill operated, changes were made to the cover layer. Several layers of imported crushed rock were mixed with the soil and wood chips and placed on Site roads for the heavy trucks. Portions of this material were stockpiled in 2014 during the wood waste removal project, east and southeast of the former sawmill, and remain on the Site for use during remediation for such purposes as construction roads. All these materials, including the construction roads, will be incorporated into the landfill, under the low permeability liner.

The existing cover soil will be salvaged to the extent possible, while making sure no waste is removed. It is assumed that approximately 50 percent of the cover soil, or 22,000 CY, may be salvaged for reuse. This material is granular and is suitable for conveyance of LFG beneath the liner and will provide a smooth surface for placement of the liner.

Solid waste along the Bay will be removed to a distance that accommodates constructing the final cap without extending the footprint beyond the existing location. The landfill will be sloped upward at approximately 20 percent, or 5H:1V, to about Elevation 20 feet MLLW. Typical stable slopes within the intertidal zone range from 4H to 5H:1V, depending on the tide and wave actions. At this location, the tidal fluctuations are less than 3 feet, and no waves have been observed. Along the BNSF ROW, the slope will be 25 percent or 4H:1V to increase the capacity of the landfill. Along most of the existing swale along the south and southwest sides of the landfill, the excavation will be sloped at approximately 33 percent (3H:1V). The top of waste final contours and elevations are shown on Drawing C-5. The estimated total quantity of solid waste to be excavated and used to create the necessary slopes would be approximately 65,000 CY.

During the waste excavation and handling, a representative will be at the Site to inspect the excavated material visually for the presence of potentially regulated waste. The inspector will use visual and olfactory observations (e.g., petroleum odor, etc.) to screen for potentially regulated waste. Any such waste that is identified (e.g., car batteries) will be set aside for off-site disposal in an appropriate, permitted facility.

The project will be constructed during the dry season (May through October), when the level of perched groundwater is typically the lowest and the low tide generally occurs during daylight hours. The existing perched groundwater within the landfill is typically encountered at Elevation 11.5 feet MLLW during the summer months. Perched groundwater will need to be recovered when excavating portions of the solid waste below the perched groundwater surface. Approximately 13,500 CY of the excavated material will be saturated. Dewatering trenches or pits will be excavated near the shoreline to intercept the groundwater prior to the start of shoreline excavation. Dewatering is expected to prevent or minimize the discharge of perched groundwater into the bay during earthwork on the shoreline. The excavation on the north side, along the BNSF railroad tracks, will be

conducted as much as possible before breaching the northeast corner of the landfill, which will open the area to the bay and tidal fluctuations. Groundwater management is discussed in Section 4.5.

The excavation along the shoreline will be conducted during the low-tide cycles that occur during the day. The relevant tides are presented in Appendix E. The shoreline excavation will be conducted in segments that can be capped with the low-permeability liner and covered daily. The excavation at the toe of the landfill will extend at least 6 inches vertically into the bay mud to anchor the liner. This approach will tie the liner into the bay mud, thus preventing or minimizing the tidal water or the perched groundwater/leachate from flowing freely under the liner. No earthwork below the HTL will occur when the tide rises to Elevation 8 feet MLLW.

All excavated solid waste will be placed onto the landfill in 18-inch lifts and compacted to build the final grades. Care will be exercised to fill any voids that may be created by oddly shaped objects (e.g., refrigerators). The landfill will be graded at 4H:1V along the north; 5H:1V along the east and southeast; and 3H:1V along the south, southwest, and west sides, up to approximately 20-feet in elevation. Subsequently, the landfill slope will be reduced to 10 percent or 10H:1V. The top slope of the final cap is shown at 6.5 percent slopes on the drawings (Drawings C-7 and 8), based on a balanced cut and fill. The actual final slope will likely be steeper due to the expansion of the solid waste during excavation and placement (also known as fluff). As the landfill is constructed, the slopes will be adjusted as needed to accommodate the quantity of solid waste placed. The final top of the landfill is expected to be at approximately Elevation 36 feet MLLW.

The final surface of the graded solid waste will be covered with 6 to 8 inches of compacted salvaged sand to fill the surface voids and to provide a smooth surface for placement of the liner. This layer will serve as the LFG collection layer beneath the liner.

4.3 LANDFILL CAP SYSTEM

The regraded and compacted final top of waste of the landfill will be covered with 6 to 8 inches of the salvaged sand on-site (existing cover soil). The sand will fill all surficial voids, provide a smooth, stable surface for placement of the liner material, and serve as the LFG collection layer below the liner.

The low-permeability liner selected for this project was identified and tested during the preparation of the RI/FS and was approved by Ecology (Amec 2017). The liner will be Cetco's GCLL, Bentomat® CL for the project. Along the slopes of the landfill, where the liner will be exposed to a saline environment, an enhanced version of the product, Resistex® Plus CL, was selected that contains certain polymers to negate the adverse effects of salt on its permeability (GCLL Enhanced). Both products have a plastic lamination that will be placed facing up to help reduce stormwater infiltration. The test report, manufacturer's product specifications, and installation guidelines are included in Appendix E.

The GCLL Enhanced (specific to a saline environment) will be placed first, as the slopes of the landfill are constructed. The maximum height of the potential exposure to salinity was evaluated during the preparation of the RI/FS, based on sea level rise and the tsunami potential at this location. The elevation of 16 feet MLLW was identified as the highest level of seawater rise (Amec 2017). The GCLL will be used in all other areas.

The base of the liner in mudflats will be anchored into the exposed bay mud by excavating a 6-inch deep trench at the toe and placing the liner and the mudflat back over it (Detail 4, Drawing C-14). The anchoring at the base is to help prevent or minimize the groundwater from entering the Bay. The sections of the GCLL Enhanced will be placed parallel to the toe from the bottom up and shingled to the top of the landfill, switching to GCLL at Elevation 16 feet MLLW. The individual sections of the GCLL/GCLL Enhanced will be overlapped 2 feet vertically and horizontally. Some bentonite powder will be placed at the overlap segment on the lower layer, then the upper layer will be placed over it. This approach will help reduce infiltration of stormwater, similar to a shingled roof.

The GCLL will be covered with a 6-inch-thick layer of imported sand (porous material) to serve as a protective layer and to provide a drainage media for the stormwater infiltrating through the cap. The sand selected will be backfill for sand drains (9-03.13), as identified by the Washington State Department of Transportation (WSDOT 2024). The manufacturer recommends placement of at least a 12-inch thick layer of material over the GCLL. This sand layer will be placed with low-contact pressure equipment (less than 5 pounds per square inch contact

pressure) to minimize the potential for damage to the GCLL. Adjustments will be made during construction based on recommendations from the manufacturer and/or installer.

The sand layer will be daylighting along the perimeter of the landfill to allow free drainage of any stormwater that may reach the GCLL. There is a potential along the southeast area of the landfill, along the existing stormwater swale, that the edge of waste may not reach the stormwater swale. Historical aerial photographs show an existing land mass and trees prior to the landfill development. The trees in this area were not cut to allow their continued use by the herons. In these areas, if encountered, drainage galleries will be constructed to drain the sand layer (Detail 2, Drawing C-14).

This sand layer will be covered with a layer of nonwoven geotextile to reduce penetration of sediments from the upper layers and maintain its porosity to convey the stormwater. The WSDOT designation for the geotextile to be used for this project will be Construction Geotextile for Permanent Erosion Control and Ditch Lining, Nonwoven, High Survivability (9-33.2[1] Table 4), Class C (Table 5). Separate sections of the geotextile will be overlapped 2 feet to maintain continuity. The geotextile will serve as a filtration media to prevent or minimize clogging of the sand layer below by the finer fractions of soil from the layers above. The geotextile will also help spread the load, thus providing some bridging for localized settlements.

To protect the liner from burrowing animals and vegetation roots, a 12-inch layer of crushed rock with gradation of 3 inches or less, referred to as 3-inch minus, will be used. The WSDOT designation for this material is Select Borrow with maximum grain size of 3 inches (9-03.13[2]). This layer will also be covered with a layer of geotextile.

A 12-inch-thick layer of silty cover soil with WSDOT designation Common Borrow (9-03.14[3]), Option 2, will be placed over the crushed rock layer. This layer will help reduce infiltration of stormwater and provide a media for the roots and growth of the final surface vegetation.

The final layer of the cap will be 6 inches of topsoil in most areas above the HTL and backfill for sand drains below the HTL. In areas where vegetating the surface will not be suitable or prudent, a layer of crushed rock with WSDOT designation Crushed Surfacing Top Course (9-03.9[3]) will be placed. This material will be placed outside the landfill entrance and along the south stormwater swale where access for maintenance will be limited. This material is considered non-erodible and will protect the subgrade. The final surface grades of the landfill are shown Drawings C-7 and C-8. The cap cross section, showing all the layers are shown as Detail 1 and a cross section showing the layering at the toe of the landfill into the Bay is shown as Detail 4 on Drawing C-14.

The removal of the solid waste from the railroad embankment will expose the embankment. The newly exposed embankment within the BNSF ROW will be covered with a layer of GCLL and 12 inches of ballast (9-03.9[1] 2-inch grain size) to enhance the structural integrity of the embankment and for aesthetics.

4.4 STORMWATER WATER MANAGEMENT

The existing landfill cap was graded to drain the stormwater to the north and south to stormwater swales that drain east, and to the east directly into the bay. Currently, the stormwater infiltrates into the landfill. The likelihood of stormwater infiltration during construction will increase during earthwork as the waste is exposed. Therefore, the primary method of construction stormwater control is containment and infiltration.

The proposed temporary erosion control measure types and locations are shown on Drawing C-2. A construction entrance will be constructed by using 4-inch minus crushed rock at the entrance, in accordance with WSDOT standards. Silt fences will be installed around the work area at the northwest entrance to the landfill. Based on field conditions, the truck tires may be washed directly, or by driving through a wheel wash, if needed. The street will be kept clean by sweeping when needed. Straw wattles will be installed in the southern/western stormwater swale, perpendicular to the flow, to filter potential runoff during earthwork in that area. A turbidity curtain will be installed along the Bay to contain sediments during earthwork.

All temporary erosion control measures will be monitored and maintained by a certified erosion and sedimentation control lead. The erosion control measures will be maintained throughout and modified as needed to control the release of construction stormwater into the bay. Potable water or treated wastewater will be used to spray on the work areas to control emission of nuisance dust, when needed.

The temporary erosion control measures will be kept in place until such time that Ecology approves their removal. The final surface of the landfill cap will be hydroseeded and shrubs planted on the slopes. Several rows of compost berm will be placed on the cap to reduce the erosion of the surface soil until vegetation takes root (Drawing C-8). Crushed rock surfacing material that is considered a non-erodible surface will be placed on the surface in some areas, such as at the entrance.

A construction SWPPP was prepared, and a permit was issued by Ecology. The project permits are discussed in Section 5.

4.5 GROUNDWATER WATER MANAGEMENT

The project will require excavation of saturated waste and groundwater controls to prevent or minimize release of the groundwater into the bay and allow construction of the engineered cap. Based on the groundwater elevations obtained during the pre-design field investigation and the design configuration, approximately 13,500 CY of the excavation will occur from below the shallow water table. This quantity is approximately 21 percent of the total volume of excavation of 65,000 CY for the project. A study of the groundwater table contours across the landfill was conducted during the RI. The groundwater was noted to fluctuate approximately 12 inches seasonally, with the highest levels noted in April. Figure 16 of the RI (Appendix E) shows water table contours for the month of April 2010, although the elevations are in a different vertical datum. The study shows the groundwater entering the Site from the northwest and flowing to the southeast as the central mound, and the water draining/flowing to the northeast and southwest, while the regional groundwater flow is generally to the north, toward the Bay.

The excavation will begin at the Site entrance, and the cap liner will be installed on the landfill side at that time, thus eliminating or reducing groundwater recharge into the landfill. The excavation along the perimeter will be conducted in small sections daily to allow placement of the liner and the first layer of soil during the same work shift. It is expected that the contractor will be able to excavate an average of 2,000 CY daily. The average quantity of saturated material will therefore be 420 CY, based on 21 percent saturated portion. Based on an average porosity of 0.4, one pore volume will generate approximately 34,000 gallons of water daily, on average. Actual quantities will be higher in the northwest and gradually drop as the work proceeds to the east, where ground surface and water table elevations decrease.

An average daily excavation of 2,000 CY will result in a daily excavation length of approximately 50 feet on the west side and up to 200 linear feet on the east side, along the perimeter. Groundwater interception trenches and/or sumps will be constructed upgradient of the work areas, along the perimeter, to intercept the flow of groundwater into the excavations (Drawing C-2). Additional pumps will be used within the excavation area and/or at the toe of the excavation to remove the water from the waste.

Two-dimensional groundwater modelling was conducted using a constant head of 16 feet and a distance of 100 feet to the toe. This scenario is based on the available groundwater information at Monitoring Well MW-21-5 (Figure 4) as the worst-case scenario. A range of 5 to 48 gallons per minute (gpm) discharge rate was calculated along a 100-linear-feet trench, based on hydraulic conductivity of 0.0001 and 0.001 centimeters per second and porosity of 0.4 to 0.45, respectively. For the design, an average discharge rate of 26 gpm is used per 100 linear feet of excavated perimeter or 0.26 gpm per linear foot. Using a conservative length of 200 feet, approximately 31,000 gallons of water will be generated daily during active excavation or a work shift (10 hours).

The placement of the liner will block the discharge of groundwater; therefore, during nonworking hours, the discharge is expected to occur along an average of 100 linear feet around the edges, which will generate approximately 22,000 gallons of water over 14 hours. Based on these estimates, an average of approximately 65,000 gallons of water will be generated daily during workdays and 22,000 gallons during nonworking hours, for a total of 87,000 gallons daily. The maximum daily water generation during non-working days (weekends) will be approximately 38,000 gallons during a 24-hour period. Applying a factor of safety of 1.5 will result in an average water generation of 130,000 gallons daily during workdays. A treatment system has been designed for this project capable of treating water at a rate of up to 300 gpm, or 18,000 gallons per hour. Therefore, the water generated during a 24-hour period will be able to be processed during a single work shift.

Groundwater extraction volume is expected to start high at the northwest of the landfill and gradually decline to zero at the northeast/east area of the landfill. The groundwater elevation at Monitoring Well MW-21-1 was found to be below the design elevation of regrading as shown on Cross Section D, on Drawing C-11, Appendix D. The total anticipated volume of groundwater during one week will be 650,000 gallons over a five-day work week and 76,000 gallons during the weekend, or 726,000 gallons. For an average weekly water generation, half of the maximum volume, or 363,000 gallons may be used during approximate duration of two months or nine weeks, based on the approximate dates shown on Drawing C-1. Therefore, the project is expected to generate 3,267,000 gallons or 3.3 million gallons. The actual volume will vary based on varying nature of the subsurface conditions and groundwater flow, as well as contractor work progress. The estimated total volume of water to be processed onsite has been conservatively estimated at 4 to 5 million gallons for design of the treatment system in the Water Treatment EDR. The treatment system components are shown on Drawing C-4 and are described below, and a Water Treatment EDR is included in Appendix E.

The treatment system will consist of an initial Reservoir to receive varying flow rates from the excavations, followed by Settling Tanks 1 A and 1B to remove settleable solids, followed by Aeration Task 2A, where air is injected to oxidize metals and chemicals are added to flocculate suspended solids and achieve further metals removal in Co-Precipitation Tanks 3A through 3C. The water will then flow to an automated Water Quality Control Unit where additional chemicals may be added to make necessary adjustments, and the water is processed through chitosan sand chambers to remove the solids, then it will be processed through filtration polishing media vessels (granular activated carbon and other additives) to remove organics. The treated water will then be stored in Holding Tanks 3A and 3B for verification sampling before discharge. Sample ports have been added between stages to allow monitoring of the effectiveness of each stage. A flow meter and totalizer on the discharge line will show the discharge flow rate, which can be adjusted by a valve, and the quantity of water is measured, which will be documented daily, or as needed, by the construction management team.

The treatment system will be installed and operated by a specialty vendor, subcontracted to the remediation contractor. The vendor operator will be certified through an Ecology-approved training company. The automated system will be able to operate 24/7 with only daily checks. In case of a system failure, an automated notification is sent to the operator, who will check on the system. Due to varying levels of suspended solids, contaminants, and concentrations, the operator will make adjustments as needed throughout the system operation to achieve the discharge standards. The final verification samples will be collected from the Holding Tanks 4A and 4B by the Construction Management team on site. Samples collected will be sent to a certified analytical laboratory and analyzed for the list of analytes identified in the discharge permits, as listed in Water Treatment EDR.

An uplift calculation was also conducted to determine the groundwater elevation above which the buoyant forces may lift the liner (Appendix E). The calculation shows that a groundwater elevation of 5.7 feet higher than the toe of the landfill (elevation of the bay mud), will cause movement of the liner. The liner will be monitored to identify any such impact. It should be noted that by blocking groundwater recharge into landfill and active groundwater extraction, it is expected the groundwater elevations will gradually decline as the project progresses to the east.

The project plans to discharge the treated water to the surface water, with a contingency option of discharge to the sanitary sewer. A temporary outfall has been designed to discharge the treated water to the south swale (Drawing C-1). The groundwater extraction and discharge operation is expected to end by the time the perimeter earthwork reaches the location of the temporary outfall, thus allowing its removal. If additional water treatment and discharge are expected at that time, a new temporary outfall may be installed elsewhere, or discharge will be made to the sanitary sewer.

4.6 SHORELINE STABILIZATION AND HABITAT RESTORATION

The existing extent of the solid waste overlaps the footprint of both the estuarine and palustrine marshes that will be excavated as part of the remediation. Approximately 0.29 acres of estuarine marsh and 0.10 acres of palustrine emergent marsh will be excavated. The total affected area of the estuarine and palustrine emergent marsh is approximately 0.39 acres. A Final Wetland and Buffer Mitigation Plan (Mitigation Plan) was prepared for this project and is included as Appendix F, and the planned work is shown on Drawings R-1 through R-7.

Mitigation for the 0.39 acres of impacted estuarine and palustrine emergent marsh will be accomplished through creation of approximately 1.15 acres of new intertidal habitat and establishment of 1.69 acres of riparian shrub habitat for a total of 2.84 acres of intertidal and riparian shrub habitat. It is expected that restored intertidal habitat will recolonize with estuarine and palustrine vegetation naturally over time from native seed sources in the Bay and adjacent marsh. Mitigation success is not dependent on the colonization of the intertidal area over the monitoring period.

The design of the habitat restoration is based on maintaining remedy integrity, selecting salt-tolerant riparian plants, and natural recruitment of salt marsh plants. A portion of the shoreline within the footprint of the remedial action will be planted with riparian vegetation. Waterward of the planted riparian vegetation, a portion of the shoreline will be modified to provide for a substrate suitable for marsh colonization from local seed sources.

Vegetation that has deep root structures could potentially penetrate the GCLL/GCLL Enhanced, effecting the protectiveness of the remedy. Therefore, species selected for the shoreline restoration need to be shallow-rooted (less than 18 inches). In addition, due to the proximity to the Bay, the shoreline plantings were required to be somewhat salt tolerant to account for potentially rare storm surge or geological events that could cause short duration inundation of the shoreline planting area by salt water. The final species list was based ultimately on best professional judgment primarily from previous restoration site work throughout Puget Sound. Plants that were successfully established at other restoration sites in Puget Sound were the focus of the plant selection used for the Whitmarsh shoreline restoration.

The lower elevation of the shoreline where riparian plantings are to be installed is 10.27 feet MLLW (HTL). The upper elevation of the shoreline riparian planting area is approximately Elevation 17 feet MLLW, which was established based on the required riparian planting area. The planting plan developed for the Site was based on typical plant spacings used at other Puget Sound restoration sites and best professional judgment.

From HTL to Elevation 20 feet MLLW, the shoreline will be seeded with a native herbaceous plant hydroseed mix. The native plants in the seed mix were selected due to their tolerance to salt and their indicator rating in the national wetland plant list. The remainder of the landfill will be seeded with an upland hydroseed mix comprising native species that were selected based on their national wetland plant list indicator rating. The riparian plantings and hydroseeding should be implemented in September and October, when the capping is completed and is close to the start of the wet season.

A critical requirement for the restoration site design is to provide adequate water for the riparian plantings during the first two years of planting. An irrigation system plan has been developed to ensure that sufficient water is available until the plants are established. The system will comprise several watering zones that will have the ability to be individually controlled by on-site moisture meters or set watering schedules. The irrigation system will be solar powered with battery backup to ensure that the system has sufficient power to operate in all weather conditions. The list of selected vegetations, their layout, and the irrigation system are shown on Drawings R-1 through R-7.

Initial and long-term maintenance and monitoring are described in the Mitigation Plan included in Appendix F. Initial five-year maintenance requirements will be implemented to ensure that newly planted vegetation becomes established and is not outcompeted by invasive species or destroyed by herbivores. Biweekly or monthly site inspections and at least biannual weeding will be conducted during the initial five-year maintenance period. Long-term maintenance will be conducted periodically after the initial five-year maintenance period and includes maintaining vegetation and other habitat attributes, control of invasive vegetation, and undertaking actions to address perturbations with a foreseeable probability of occurrence (e.g., rail accidents, illegal dumping, etc.), excluding force majeure events.

Monitoring of the restoration plantings will be conducted at Years 1, 3, and 5 after initial planting unless monitoring is terminated prior to Year 5 as described in the Mitigation Plan. Monitoring will include estimated riparian plant survival and herbaceous plant, marsh plant, and invasive species areal coverage. After each monitoring event, a report will be submitted to Ecology describing the monitoring event results.

4.7 CONSTRUCTION CONSIDERATIONS

4.7.1 HERON MANAGEMENT

The contractor will be required to implement noise and disturbance control measures identified in the HMP (Appendix B) to the extent possible. The basic approach of construction in the clockwise direction, starting at the gate, has been included in the design (Drawing C-1). The noise and disturbance levels will be monitored throughout the breeding season, in accordance with the recommendations in the HMP. At the start of a new activity on-site, noise and biological monitoring will be conducted, and the activity will be modified, if needed. A handheld, portable noise monitor will be used by the construction management team every day to monitor the noise levels. A stationary noise recorder will be placed at the base of the heronry, on the south side of South March Point Road, to document the noise level at the edge of heronry.

If any extended exceedance of the allowable noise level of 85 decibels is noted or if biological monitoring indicates a real potential of disturbance to the heronry, the specific activity will be halted until a solution is implemented.

4.7.2 INADVERTENT DISCOVERY

The landfill site is not known to have cultural resources artifacts. However, Josephine Peters of the Swinomish Tribal Historical Preservation Office will be contacted at (360) 488-3860 to consult on activities prior to any excavation work.

During the excavation and earthwork activities, observations will be made for inadvertent discovery of such articles. If any are found or are suspected, the work at that location will stop and the Swinomish Tribal Historical Preservation Office will be contacted. A Cultural Resources/Inadvertent Discovery plan has been prepared and is included as Appendix G.

4.8 SITE RESTORATION

The Site restoration activities will include construction of an access road that traverses the Site close to the perimeter of the landfill (Drawing C-8). The road will be constructed using the crushed rock (Select Borrow) used for construction of the cap. Along the road alignment, no cover soil or topsoil will be placed, instead crushed rock will be placed to the final grade. The top of the access road will be elevated above the adjacent grades to create a barrier in front of surface stormwater flow to slow it down and provide some filtration, and to have the driving surface elevated above the surrounding area to help keep it dry and accessible. At locations where the irrigation piping will be installed, a 4-inch diameter high-density polyethylene (HDPE) sleeve will be installed prior to construction of the elevated portion of the road to allow the irrigation piping to be installed through it. Cross sections of the final access road are shown as Details 3 and 5 on Drawing C-14.

To maintain Site security and prevent or control public access to the Site after completion of remediation, a permanent chain-link fence with appropriate gates will be installed around the perimeter of the Site, where it is readily accessible and at higher elevation than the plantings (Drawing C-8). The permanent fencing and gates have been selected from WSDOT standards (fencing Type 3; gates Plan L-30.10). All components of the permanent fencing will be poly-coated with green polymer to prevent release of zinc to the environment.

5 CONSTRUCTION

This section describes the anticipated construction activities and sequencing. Skagit County has signed Access Agreements with BNSF, DNR, and other property owners for this project. The project permits and construction are discussed in this section. The project quantities have been summarized and are presented in Table 4. Table 5 presents the earthwork quantities in each work zone shown on Drawing C-1.

5.1 PROJECT PERMITS

Under the Model Toxic Control Act (MTCA), state and local permits are not required to be obtained; however, substantive compliance with the permit requirements is required. The project permits and a summary table of permits' requirements and responsible parties are included in Appendix H.

5.1.1 U.S. ARMY CORPS OF ENGINEERS PERMIT

In November 2022, the USACE determined that the cleanup of the landfill was authorized under Nationwide Permit (NWP) 38, Cleanup of Hazardous and Toxic Waste (Federal Register, December 27, 2021, Vol. 86, No. 245). The NWP was issued with special conditions that were established to minimize or eliminate potential impact to threatened and endangered species. After issuance of the NWP, the project requirements changed, which required a change to the project design. The revised design was submitted to the USACE to ensure that the work still complied with NWP 38 conditions. In July 2023, the USACE re-verified that the project was authorized under NWP 38, since the limit of the permit is below the existing HTL along the Bay.

5.1.2 WATER QUALITY CERTIFICATION

As part of the permitting process, Ecology issued a Substantive Section 401 Water Quality Certification. The 401 Certification established measures to reduce the potential impact of project construction on state surface waters. The 401 Certification also established mitigation requirements for the project. Subsequently, the project planned to discharge the treated water to the surface water via a temporary outfall to the south swale. Ecology reviewed the change and determined it will not impact the certification as issued.

5.1.3 HYDRAULIC PROJECT APPROVAL

Although the project was not required to obtain a Hydraulic Project Approval, the Washington Department of Fish and Wildlife (WDFW) provided MTCA Substantive Comments consistent with Chapter RCW 77.55.021 and Chapter WAC 220-110 of the Washington State Hydraulic Code. These comments fulfilled the substantive permit requirement compliance under MTCA.

5.1.4 CONSTRUCTION STORMWATER

Skagit County prepared an SWPPP and applied for a construction stormwater discharge permit even though no discharges are planned. Ecology issued Permit No. WAR313996-2024-11-25, under a Construction Stormwater General Permit. When the decision was made to discharge the treated water to surface water, Ecology issued an Administrative Order outlining the requirements and the allowable discharge standards. Based on input from the analytical laboratory, Ecology revised the allowable discharge standards in an Amended Administrative Order.

5.1.5 CITY OF ANACORTES SUBSTANTIAL COMPLIANCE

While the project does not need to obtain local project permits, the local authority does need to review the project and accept it as being in substantial compliance with their codes and standards. The relevant information for the project was submitted to the City of Anacortes for review and acceptance. The City required completion of a stormwater site plan, in accordance with their standards. A letter evaluating the project with regards to stormwater and outlining nine elements of minimum requirements was submitted to Ecology for review on May 31, 2024. In turn, Ecology forwarded the letter to the City and received acceptance of the project as being in substantial compliance via email.

5.1.6 WASTEWATER DISCHARGE PERMIT

The project plans to discharge the treated water to surface water. Ecology's surface water group issued an Administrative Order and Amended Administrative Order to allow the discharge. To have an alternate discharge option during construction, Skagit County has decided to obtain a discharge permit for discharge to the sanitary sewer. The Water Treatment EDR (Appendix E) was prepared to apply for discharge to Ecology's Industrial

Wastewater group. Upon approval by Ecology, an application for discharge to the sanitary sewer will be submitted to the City of Anacortes wastewater treatment plant. Currently, neither permit is available, but the known requirements are shown on the summary table of requirements in Appendix H. Both permits will be provided to Ecology when available and will be included in the Final Construction Report.

5.2 MOBILIZATION AND SITE SETUP

Prior to any earthwork, the contractor will complete Site setup, which includes the following:

- Mowing the Site, as needed.
- Abandoning the existing monitoring wells and LFG probes.
- Installation of perimeter temporary chain-link fence around the work area. The temporary fencing will have a visual barrier screen along South March Point Road to reduce the potential for any contaminated waste or water (splashing) from leaving the Site accidently and reduce the likelihood of onlookers for extended period near the work area.
- Installing temporary erosion control measures.
- Positioning of field office trailers, generator(s), and pump(s), and temporary sanitary facilities.
- Assembling the groundwater/stormwater treatment system.
- Constructing the temporary outfall for discharge of treated water.
- Modifying the connection to the sanitary sewer system to allow discharge of treated water.
- Constructing Site access roads, if any.
- Preparing staging and stockpile areas.
- Demolition of existing gate and chain-link fence.
- Capping Site utilities at the property line.
- Relocating the existing stockpiles on-site, as may be needed.
- Establishing the initial exclusion zone and decontamination station prior to the start of excavation.

The well abandonment will follow the Well Abandonment Work Plan included in Appendix I. The remediation contractor will determine the actual locations of the Site preparation elements and any relocation during the construction phase. The temporary erosion control measures will be evaluated and monitored throughout the project and any necessary changes will be made to meet the objective of their intended purpose.

5.3 EARTHWORK

The excavation will start at the landfill entrance and proceed in a clockwise direction around the landfill. This approach will allow the noise-generating activities to be the farthest from the heronry, and based on project progress, will be closest to the heronry at the end of the breeding season (Drawing C-1). This sequence of construction will also allow the project practices, specifically groundwater management, to be improved and refined before the earthwork reaches the Bay.

The excavation equipment will be fitted with a GPS unit, and the project computer-aided design (CAD) file will be uploaded into the computer. The operator will always know the position of the bucket with respect to the design elevations. The information is recorded and downloaded daily to monitor the quantities. Initially, then periodically, the elevations and surfaces will be field verified by a registered land surveyor.

The initial excavation outside the landfill entrance will be conducted in two segments, north and south, as determined by the remediation contractor. Each segment will be backfilled to grade once all waste is removed

from that segment. This approach will maintain vehicular access to the Site. All excavated material will be incorporated into the landfill below the cap.

The bottom of the excavation is expected to extend several feet below the water table. The excavation will be dewatered to allow the work to proceed and test the on-site temporary treatment system. The horizontal and vertical extent of the excavation will be determined based on visual or olfactory indications for waste by the construction management team. The excavated material will be hauled to the central area of the landfill for final deposition.

The excavation below the water table will either be backfilled with crushed rock or imported soil with lower permeability, until the backfill rises above the water table and is covered with a layer of geotextile. Imported soil will be used to backfill the excavation to within 4 to 6 inches from the final grade. The final 4 to 6 inches of the backfill to the final grade will be with WSDOT Crushed Rock Surfacing, Top Course (9-03.9[3]). This material is considered non-erodible for stormwater runoff. The backfill material will be placed in compacted layers to minimize future settlement.

All abandoned monitoring wells that will be encountered will be broken off at the bottom of the excavation by the excavator bucket and removed. This activity will be most critical for the deep wells that penetrate the aquitard, but it is believed the deep wells will not be encountered in the landfill perimeter earthwork. If an unknown well is found that has not been abandoned previously, then the work in that area will stop and well will be abandoned in accordance with the well abandonment work plan, by a licensed driller.

Inside the landfill, the excavation limits and final top of waste elevations will be based on the design, as shown on Drawing C-5. Excavation will proceed eastward along the railroad tracks and will be conducted sequentially, in segments that on the same day can reach the final top of waste grades and be covered with the GCLL/GCLL Enchanced and the sand layer. When excavating waste over the railroad embankment, care will be exercised not excavate any portion of the railroad embankment. The amount of the fill placed over the liner will be based on the manufacturer and installer recommendations. If more weight is needed, additional sand will be placed. When the final capping occurs, the additional sand will be used to form the toe of the slope below the HTL.

Groundwater will be removed during the work from upgradient interception trenches or sumps and additional temporary sumps within the waste and at the toe of the excavation. The actual locations, depths, and construction will be determined by the remediation contractor and will be documented by the contractor and the construction management team. The final depth of the excavation will be to the original mudflat or approximately Elevation 5 feet MLLW; actual elevation will be determined in the field. The surface of the original mudflats will likely be impacted by the waste. Any sediment exhibiting visual or olfactory indication of contamination will be excavated. The final surface of the newly exposed mudflats, within the BNSF ROW, will either be graded or sand will be placed to have positive slope to the east, such that fish will not be trapped after a tide cycle.

This approach will minimize the area of disturbance and reduce the amount of groundwater removed. Once the liner is placed and covered with the sand layer, the flow of groundwater out of the waste during nonwork times will be limited to the excavation transition zone between the east end of the liner placed and the existing grades. This zone will be the largest at the start in the northeast area and less as the work proceeds east. The differential elevation between the water table and the bottom of the excavation is approximately 12 feet in the northwest and will be reduced to approximately 5 feet in the northeast. The transition zone is expected to be approximately 80 feet long at the northwest and 20 to 25 feet long at the northeast along the railroad tracks. Some seepage is also expected to occur from an approximately 30- to 40-feet length along the east end of the area within the BNSF ROW caused by the upgradient flow of groundwater that will have to travel around the newly placed landfill cap. Pumps will be placed at the toe of the slopes where the seeps occur and will be operated round the clock. It is expected that seepage from the upgradient source will not be considered contaminated Site groundwater, and its capture will be terminated once the earthwork enters the Bay.

As the excavation proceeds along the railroad tracks, the waste will be scraped off the surface of the railroad embankment to the extent possible without compromising the structural integrity of the embankment. The bottom of the newly exposed mudflats will be graded to eliminate water ponding when the tide goes out and maintain a positive drainage to the east (Drawing C-7). If needed, imported sand will be used to grade the newly exposed mudflats.

The northeast corner of the landfill will not be excavated until all possible earthwork that may be adversely affected by Bay's tidal action is completed. At that location, the existing debris on the mudflats will also be removed.

Excavation along the bay will be conducted during low tides. Work below the HTL will end when the incoming tide reaches Elevation 8.0 feet MLLW. The excavation will continue working with the tides until the work gets beyond the HTL at the eastern portion of the south stormwater swale. The available tide table for the months of May through September are included in Appendix E.

The edges of the waste along the western portion of the south stormwater swale will be inspected for total depth. Where the waste is less than 3 feet deep, it will be removed to reduce the footprint of the landfill and capping and to widen the swale. The actual final toe of the landfill in this area will be determined during construction.

All excavated waste will be placed on the central area of the landfill in 18-inch lifts and track-compacted at least three times or until a firm surface is achieved, as determined by the construction management team. The densification of the fill placed can only be based on field evaluation due to the heterogeneous nature of the waste. The existing broken up concrete slabs will be removed to an extent where the edges of the existing slab are approximately 3 feet below the top of the waste. This separation will help reduce the potential for adverse impact to the liner that may be caused by future settlement. The wet waste will be mixed with the dry waste, where needed to achieve a firm surface.

The central area of the landfill will be fine graded near the end of the earthwork to verify the final slopes of the landfill. It is possible the final grades will be slightly steeper than shown on design drawings (C-7 and C-8). Although, it is not expected to be steeper than 10 percent slope.

5.4 SITE CAPPING

The final top of waste will be covered with 6 to 8 inches of salvaged Site sand and/or granular portions of Site soil that the construction management team deems suitable for this application. The sand will be track-compacted to a firm, nonyielding surface. The top of this layer will be fine graded to the extent needed to form the final shape of the landfill cap. This layer will be used for collection and conveyance of the LFG, and a smooth surface for placement of the liner (GCLL/GCLL Enhanced). Any sharp objects or gravel larger than one inch that may damage the liner will be removed.

The liner will be placed starting at the toe of the landfill during earthwork, parallel to the toe, and shingled as its placement proceeds uphill. The toe of the liner will be anchored into the exposed bay mud by excavating a 6-inch deep trough to place the liner and will be backfilled with excavated bay mud. The anchoring will serve as a seal at the toe to prevent or minimize the release of groundwater into the Bay. The separate pieces of the liner will be overlapped a minimum of 2 feet, or as recommended by the manufacturer and installer. A small quantity of bentonite powder will be placed on the lower piece prior to placement of the upper layer. The bentonite will seal the joint once hydrated. The extent of the overlap and the amount of the bentonite powder will be as recommended by the manufacturer. Once the liner is placed, no equipment or vehicular traffic will be allowed directly on top of liner.

Should any damage to the liner be observed, the damaged section will be cut out and removed, and a patch will be placed over the section with a minimum overlap of 2 feet with adjacent liner in all directions. Small quantity of bentonite powder will be placed at the overlap to seal it.

The layer of drainage sand will be placed on top of the liner in one lift, placed by a low-contact pressure bulldozer with contact pressure of 5 pounds per square inch, or less. The layer will be lightly compacted by the equipment tracks. No sudden starts, stops, or sharp turns will be allowed. The sand drainage layer will be placed daily over any liner placed that day. The drainage sand layer will be covered with a layer of geotextile. Separate pieces of the geotextile will be overlapped at a minimum distance of 2 feet to maintain continuity.

The crushed rock layer will also be placed in one lift and track-compacted. A larger/heavier bulldozer may be used to place this layer due to the 18-inch separation from the liner. No sudden starts, stops, or sharp turns will be allowed. Manufacturer's recommendation for the equipment contact pressure will be followed. his layer will also be covered with geotextile.

The cover soil layer will also be placed in one lift and track-compacted. The top of this layer will be approximately 2.5 feet above the liner, which will virtually eliminate the potential for damage to the liner by construction traffic. The final layer of topsoil or crushed rock surfacing will be placed over the cover soil and track-compacted.

The newly exposed surface of the railroad embankment will be covered with a layer of GCLL and covered with 12 inches of railroad ballast. This layer will enhance the structural integrity of the embankment and its aesthetics.

The LFG collection piping will be installed within the salvaged Site sand layer below the liner, and vents will be installed through all the cap layers to rise approximately 2 feet above the final cap elevation at that location. The liner and geotextile layers will be patched with an overlap section to maintain the low-permeability seal of the liner (Details 2 and 3, Drawing C-13) and filtration function of the geotextile. The separate pieces of the LFG collection and venting system will be coupled mechanically using screws instead of welding. The contractor will determine the timing of the LFG collection and venting system based on their operational preference.

All earthen material that will be placed above the liner will be imported from approved sources. Ecology requires the earthen material that will encounter the bay water by tidal action or by stormwater flowing on its surface to meet sediment cleanup standards. These materials are the sand for the drainage layer, topsoil, and compost. The cap cover soil will remain above the HTL and will be covered with topsoil or crushed rock surfacing. The cover soil will need to meet MTCA Method A Cleanup Standards for Unrestricted Use. The crushed rock layers on this project cannot effectively be characterized chemically, and therefore, Ecology eliminated chemical characterization of this material. However, all grades of the crushed rock and ballast will be required to be obtained from virgin sources in a commercial quarry, approved by WSDOT.

WSP identified two sources of import material and collected samples and analyzed them for characterization and suitability for use. WSP prepared an Import Material Characterization Report, and Ecology approved the report (Appendix I). The preferred source of topsoil and compost will be from Growsource in Bellingham, WA. If sufficient quantity is not available, then the available material will be used on the slopes closest to the Bay, and additional material will be obtained from Sunland Bark and Topsoil in Anacortes and placed at higher elevations on the landfill. Four rows of filtration compost berms have been added to the design on the final surface to reduce the velocity of stormwater runoff and filter it until the surface vegetation takes root. If any sediment from the topsoil from Sunland is observed to enter the Bay, then Ecology might require monitoring. The sand may be obtained from either source characterized. The Common Borrow may also be used from either source, but one round of chemical characterization will be required from the material that will be imported. The chemical analyses will include total petroleum hydrocarbons and Resource Conservation and Recovery Act metals (RCRA 8 metals). An Import Material Characterization Report was prepared and is included in Appendix J.

5.5 GROUNDWATER MANAGEMENT

During Site setup, the groundwater treatment system will be assembled in accordance with Drawing C-4, Appendix D, or as agreed upon with the treatment vendor, subcontractor to the remediation contractor and made ready to treat groundwater. The excavations will start outside the Site entrance, where excavation will be confined by the sidewalls. This will allow installation of the landfill liner at the Site entrance, thus eliminating or reducing the groundwater recharge into the landfill. Sufficient groundwater will be extracted to generate two batches of treated groundwater. Each batch quantity may vary based on the site operations, e.g not more than 8,000 gallons of wastewater accumulated. Each batch size was left up the field staff/designer to determine by Ecology. A batch size of approximately 10,000 gallons of treated water is assumed. Each batch will be sampled by the construction management team from the sample port on the discharge side of the treated water in Holding Tanks 4A and 4B, Drawing C-4. he test results will be submitted to Ecology's Water Quality Program for approval. If a sample fails the testing, then the treatment system will be re-calibrated and the accumulated water treated again and tested again. Once the treatment system is found to be able to meet the discharge standards, then refuse excavation on the landfill will begin. The sampling frequency, list of analytes, test methods, and allowable discharge limits are identified/dictated by the permitting agencies, and are included in the Water Treatment EDR, Appendix E. The sample containers will be provided by the analytical laboratory. In the event of a test failure and limited available capacity in the treatment system, groundwater generated from the excavations can be re-circulated on site through infiltration pond(s) to be excavated in the central area of the landfill. Actual location and size will be determined in the field based on flow rates and contractor operations.

Upgradient interception trench and/or sumps will be excavated along the section of work each day to intercept recharge to the excavation area. Pumps will be used within the excavation zone and/or at the toe to dewater the refuse as the excavation occurs. Once the top of refuse reaches the design grades and groundwater seepage on the slopes is controlled, then the liner will be installed to an elevation where the groundwater would not flow over it. The sand layer will also be placed over the liner during the same shift. The sand may also include the quantity needed to be placed below the HTL to weigh down the liner and have sufficient sand on hand to construct the final toe of the cap.

The liner is expected to block the seepage of groundwater. However, groundwater seepage is expected on the west side, between the liner and the railroad embankment, and on the east side, where the liner placement stops. Pumps will be placed in those areas at the toe of the slope to capture the seepage overnight and on weekends. Modifications of the groundwater extraction will be made in the field such that groundwater does not leave the work area into the open excavation, or into the bay, when the excavation operations reach the east side of the landfill along the bay.

All extracted groundwater will be transferred to the treatment system and processed and discharged through the temporary outfall in the south swale. Inline grab samples of the treated groundwater will be collected and analyzed weekly, in accordance with the Administrative Order. If a test fails, then the discharge will be terminated and the treatment system adjusted to meet the discharge standards.

The work will be conducted during the dry months of spring and summer, which historically have relatively small quantities of precipitation that will infiltrate into the waste. However, any problematic stormwater will also be extracted by pumps and transferred to the treatment system.

Based on the groundwater elevation measured at Monitoring Well MW-21-1, the groundwater on the east side is expected to be below the mudflats (Cross Section D, Drawing C-11), and therefore, once the excavation reaches the east slope of the landfill, groundwater extraction is expected to end or become minimal in quantity. When the excavation activities reach the temporary outfall, the outfall will be removed to allow restoration of the swale. At that point, only a small quantity of wastewater should need to be treated and discharged, which will most likely be limited to equipment decontamination rinsate. That small amount may be discharged to the sanitary sewer, or a new smaller temporary outfall may be installed elsewhere on-site, with Ecology's approval.

5.6 WASTE MANAGEMENT

There is a possibility of encountering waste in the landfill that does not classify as solid waste, such as car batteries or industrial waste. Such waste will be segregated and stored on-site pending characterization. Additionally, contaminated waste generated as the result of the construction will be stored on-site pending characterization for off-site disposal. Those materials include, but are not limited to, personal protective equipment (PPE), spent granular activated carbon, sediments in settling tanks, spent filtration sand, and used sorbent material. All waste that cannot be incorporated into the landfill will be stored on-site, characterized, and disposed of at an approved facility.

All wastewater generated will be processed through the on-site treatment system and discharged to the surface water or the sanitary sewer. If wastewater is generated after demobilization of the treatment system, the wastewater will be characterized and disposed of off-site using either a vacuum truck or drums.

Uncontaminated waste, such as packaging material, will be disposed of off-site through Skagit County's waste transfer station.

5.7 LANDSCAPING AND HABITAT

After completion of the capping and final grading of the Site, hydroseed and riparian shrub plantings along the shoreline will be installed as pre the approved mitigation design (Appendix F). The shrub species identified in the plans will be installed by hand excavation of a planting pit for each plant. The planting pit will be dug per the planting detail in the design. After the plant is placed, the pit will be backfilled with soil and soil amendments. Hydroseed using a native seed mix will be applied after installation of the riparian plants.

5.8 HEALTH AND SAFETY

WSP has prepared a Site-specific Health and Safety Plan (HASP) for its personnel and their activities (Appendix K), which was provided to the contractor as a guide to help them prepare their plan for their workers and activities. Throughout the project, the work zones will be established as the work progresses and maintained, to prevent cross contamination and limit potential exposure of the visitors and personnel not wearing the appropriate PPE. Work will be conducted in modified Level D PPE. Air monitoring for volatile compounds and explosive gases will be conducted to verify safe conditions. If the concentrations of volatile compounds in the workers' breathing zone exceeds the levels established in the HASP, mitigation measures will be taken, such as upgrading to Level C PPE. The remediation contractor will be responsible for Site safety.

All workers on site will have appropriate hazardous waste operations and emergency response training and medical monitoring. Workers entering the BNSF ROW will also have the required BNSF safety trainings. During construction, daily safety meetings will be held with all staff and workers on-site when the activities for the day are discussed and safe practices conveyed. Each person present will sign the daily safety meeting form, and the copies will be kept on-site. Visitors will be briefed on the hazards on-site and will be kept away from work areas. The practices and the HASP will be modified as needed, to meet the conditions encountered. If an unsafe situation or practice is observed, the work will be stopped until a mitigation measure is identified and implemented.

5.9 CONSTRUCTION QUALITY ASSURANCE

Project construction will be monitored by WSP's construction management team, who will be on-site full-time for the duration of all field activities. The construction management team will be responsible for all inspections, verifying that all installations will be in accordance with the design and specifications and making necessary changes, if needed. The roles and responsibilities of Skagit County, WSP, and the remediation contractor are described in a Construction Quality Assurance Project Plan included as Appendix L.

5.10 CONSTRUCTION DOCUMENTATION

The construction activities will be documented in daily activity logs and other tracking tables to document the procedures, material used, and verification testing and inspections, in accordance with WAC 173-340-400. Weekly progress meetings will be held between the remediation contractor, Skagit County, the WSP construction manager, and any other parties that may have an interest. The project accomplishments, status, construction schedule, challenges and solutions will be discussed. Daily activity logs will be submitted to Skagit County. A summary weekly activity log will also be prepared and distributed to interested parties. Project progress will also be documented photographically.

After completion of construction, WSP will prepare a Construction Completion Report that will summarily document the project implementation, challenges, solutions, and any deviations that may have become necessary. The report will include the final record drawings provided by the remediation contractor and disposal documentation for all waste disposed of off-site. A draft construction report will be submitted to Ecology approximately three months after all necessary final records are provided to WSP. Those records will include record drawings, waste manifests, etc.

6 LONG-TERM MONITORING AND MAINTENANCE

6.1 MONITORING WELLS AND LANDFILL GAS PROBES

The groundwater conditions in the landfill will be monitored for groundwater levels, vertical gradient between the shallow and deep aquifers, and for conditional point of compliance water quality conditions in the deep aquifer, as established in the CAP. After completion of Site capping, six pairs of shallow and deep groundwater monitoring wells will be installed on the landfill along the Site access road (Drawing C-8). The shallow monitoring wells will be approximately 15 feet deep and the deep monitoring wells will be approximately 45 feet deep to extend into the lower aquifer. In addition, two shallow groundwater monitoring wells will be installed outside the landfill entrance at the northwest to verify the landfill capping will not cause groundwater to rise to the ground surface due to the low-permeability cap. The monitoring wells will be equipped with self-logging water level transducers to document the water levels.

The off-site migration of the LFG will also be monitored from three LFG probes that will be installed outside the entrance and on the south side of South March Point Road (Drawing C-8). The LFG probes will be installed above the groundwater table and will likely be approximately 7 feet deep.

The monitoring wells and LFG probes will be installed after completion of the final landfill cap and prior to the remediation contractor demobilization. The landfill cap at the monitoring well locations will be excavated in layers and subsequently restored to re-establish the cap layers, as shown as Detail 2 on Drawing C-13. A Monitoring Well Installation Work Plan has been prepared and is included in Appendix M.

6.2 HABITAT MONITORING AND MAINTENANCE

As part of the landfill remediation, construction will affect approximately 0.39 acres of existing wetland habitat. The Mitigation Plan (Appendix F) details the restoration/creation of a riparian scrub buffer, and maintenance and monitoring of the buffer.

6.2.1 BUFFER MONITORING

Monitoring of the restored/created habitat will be conducted to ensure that the restoration goals are met. Monitoring will be conducted at Years 1, 3, and 5 post-planting. In addition, an as-built survey will be prepared that will document the plants that were installed and will serve also as a "Year 0" monitoring report.

6.2.1.1 Success Criteria

The following success criteria will apply to the project in Year 5:

- Planted shrub survival will be ≥ 70 percent.
- There will be ≤ 20 percent bare ground.
- There will be ≤ 10 percent cover invasive species identified on the 2024 Skagit County Noxious Weed List (Mitigation Plan, Appendix F).
- Herbivory is effectively controlled (based on obvious plant mortality due to herbivory).

Although monitoring to assess the above will be conducted during Years 1 and 3, the success criteria will only apply to Year 5. The Years 1 and 3 monitoring will be used to determine whether adaptive management or contingency measures may need to be applied to meet the success criteria at Year 5. Monitoring of potential recruitment of marsh plants to the newly constructed intertidal area will be conducted in Years 1, 3, and 5. However, no success criteria for marsh plant recruitment will apply. If the success criteria are met prior to Year 5, then monitoring may be terminated in consultation with Ecology and other applicable permitting entities.

6.2.1.2 Contingency Measures

Contingency measures that may be conducted are designed to help meet success criteria, such as replacing (replanting) dead plants, adding soil amendments, installing supplemental irrigation, augmenting herbivore exclusion systems, etc. Prior to any contingency measure being implemented, an investigation as to why the criterion was not met will be conducted.

6.2.1.3 Adaptive Management

If the success criterion is not met because of design flaws, mortality due to herbivory, or insufficient routine maintenance, then an adaptive management approach may be used. Prior to implementation of adaptive management measures, the cause of the failure to meet a success criterion will be investigated. Adaptive management measures could include, but are not limited to, changing plant species, changing plant densities, adding fertilizer, or installing herbivore exclusion systems (e.g., netting, cages, or tubes around plants).

6.2.2 BUFFER MAINTENANCE

There are two levels of buffer maintenance: initial five-year maintenance and long-term maintenance. Each of these are described below.

6.2.2.1 Initial Five-Year Maintenance

The initial five-year maintenance requirements were developed to ensure that newly planted vegetation becomes established and is not outcompeted by invasive species or destroyed by herbivores. The initial maintenance may include site inspections, watering, mulching, weeding, and removal of trees, dead invasive shrubs, and anthropogenic debris.

Site Inspections

During the initial five-year period, inspections will be conducted periodically to assess the following conditions:

- The plants are receiving sufficient water or require additional mulching.
- The Site requires weeding.
- Naturally recruited trees are colonizing the Site.
- The Site requires replanting or anthropogenic debris removal.
- The herbivory is effectively controlled.

Watering

A temporary irrigation system will be installed that can be used when rainfall is inadequate to sustain vegetation and “supplemental watering” is needed. During the growing season (April through October) soil moisture monitoring using soil moisture meters or best professional judgment will be conducted to determine whether plants are receiving sufficient water and whether supplement watering is required each week. Supplemental watering will cease by Year 3 (or sooner, if deemed appropriate) to assess and ensure conditions are suitable for plant survival without irrigation in the following years.

Mulching

Mulching will occur during initial plant installation to help retain soil moisture by reducing evaporation and erosion, and to provide nutrients for the plants.

Weeding

Weeding around upland riparian shrubs will be conducted to ensure establishment of the shrubs and prevent stress to the plants from competition for resources. The frequency will be determined by using best professional judgment. Most of the weeding will be performed using simple hand tools (e.g., rakes, hoes). Chemical treatment (herbicides) will be considered only if physical removal fails. Chemical treatments will only be applied after consultation and coordination with the appropriate local jurisdictions and Ecology.

Tree Removal

Trees with deep root systems pose a potential threat to the integrity of the GCLL engineered cap and will not be planted or allowed to propagate. Volunteer tree species that recruit to the Site will be removed as needed to prevent establishment.

Dead Shrubs

Dead native plants will be left on-site as a potential soil nutrient source and possible nesting and food source for animals. Dead native plants will only be removed if the plants will potentially interfere with replanting if required. Replacement planting will be conducted and documented if shrub mortality of 30 percent or greater is observed during the first five years. Any dead invasive shrubs will be removed from the Site to limit potential invasive seed sources.

Debris Removal

Anthropogenic material that potentially impairs habitat functions will be removed from the perimeter of the Site on an as-needed basis. Small material will be removed by hand when practical.

Herbivory Control

During periodic inspections and routine maintenance, plants will be inspected to determine whether herbivory is potentially affecting riparian shrub survival. If severe cropping of plants by herbivores is observed, herbivory control measures (e.g., tree tubes or fencing) will be considered for installation.

6.2.3 BUFFER LONG-TERM MAINTENANCE

Long-term maintenance will be conducted on an as-needed basis by facility maintenance or landscaping crews after the initial five-year maintenance period. Long-term maintenance includes maintaining vegetation and other habitat attributes, control of invasive vegetation, and undertaking actions to address perturbations with a foreseeable probability of occurrence (e.g., rail accidents, illegal dumping, etc.), excluding force majeure events.

6.2.4 REPORTING

After completion of the construction of the restoration project, a restoration as-built report will be submitted that documents the acreages of the habitats that were created, the number and species of shrubs that were planted, and the as-built planting drawings. The planting as-built report may be included as part of the as-built report that will be submitted for the overall cleanup. The as-built report will provide the information detailed in Ecology's guidance for as-built reports.

An ecologist will prepare a draft and final monitoring report for submittal to Ecology after each monitoring event.

6.3 LANDFILL MONITORING AND MAINTENANCE

After completion of Site remedial activities, the landfill will be inspected for signs of settlement, erosion, and seeps twice a year, at the start and end of the wet season, near the end of October and early May, respectively. The inspections will include a visual inspection of the entire landfill, and if any issues are identified, then a recommendation will be made as to the remedy and urgency. Additional inspections may be conducted if there is a reason to believe conditions may have changed between the scheduled inspections, such as occurrence of a 100-year storm event.

If any seeps from the landfill are observed, the locations will be marked and documented by recording the seep location using GPS and inspected again in the next inspection round. If a seep is noted again, then plans will be made to sample the seep for the presence of landfill constituents. It should be noted that stormwater drainage and tidal fluctuations will cause water to flow into the bay from the landfill cap layers. Therefore, the inspections will be timed to coincide with when the tides are coming in and several days after a storm event. The timing of the inspections will increase the likelihood that the flow out of the cap would be a seep and not stormwater draining out.

Site maintenance will include mowing the grass twice during each dry season. If any sign of settlement is observed, such as localized depressions causing stormwater ponding, the problem areas will be identified and filled with topsoil. If the settlement is believed to require more substantial repair, the plans will be made to either investigate, or if the cause is known, excavate the landfill cap layers and re-establish the cap to make sure the cap continues to function as intended. The inspections will document locations and signs of erosion and evaluate the severity and urgency to repair. The remedies may include replacement of an eroded section or installation of additional measures. An example of the latter may be construction of 12- to 18-inch-high crushed rock berms on the landfill surface, perpendicular to stormwater flow, to reduce its velocity and offer some filtration. In the unlikely event of a catastrophic slope failure, immediate action will be taken to restore the slope.

A high water table inside the capped landfill can cause uplift pressure on the GCLL liner, compromising the overall cap integrity. An analysis was conducted to identify the groundwater elevation at which uplift pressure may damage the GCLL (Appendix E). Based on the analysis, the groundwater level needs to remain below approximately 4 feet above the HTL, or Elevation 14.27 feet MLLW. Groundwater elevations will be measured in the long-term monitoring wells, which are scheduled to be installed near the end of construction when the landfill cap has been completed. If the groundwater levels appear to be of concern, additional groundwater extraction will be conducted, using the shallow monitoring wells, to lower the groundwater level to a safe elevation.

If the groundwater monitoring wells and landfill gas probes identify an issue, then a remedy will be identified and presented to Ecology. The approved remedy will then be implemented. An example of the issue would be buildup of the groundwater level within the landfill. If groundwater buildup occurs, then groundwater extraction well(s) will be constructed and Site dewatering, treatment, and discharge will be implemented.

After each inspection, a summary report will be issued that will identify the findings, any issues identified, and recommended course of action for any repair.

7 REFERENCES

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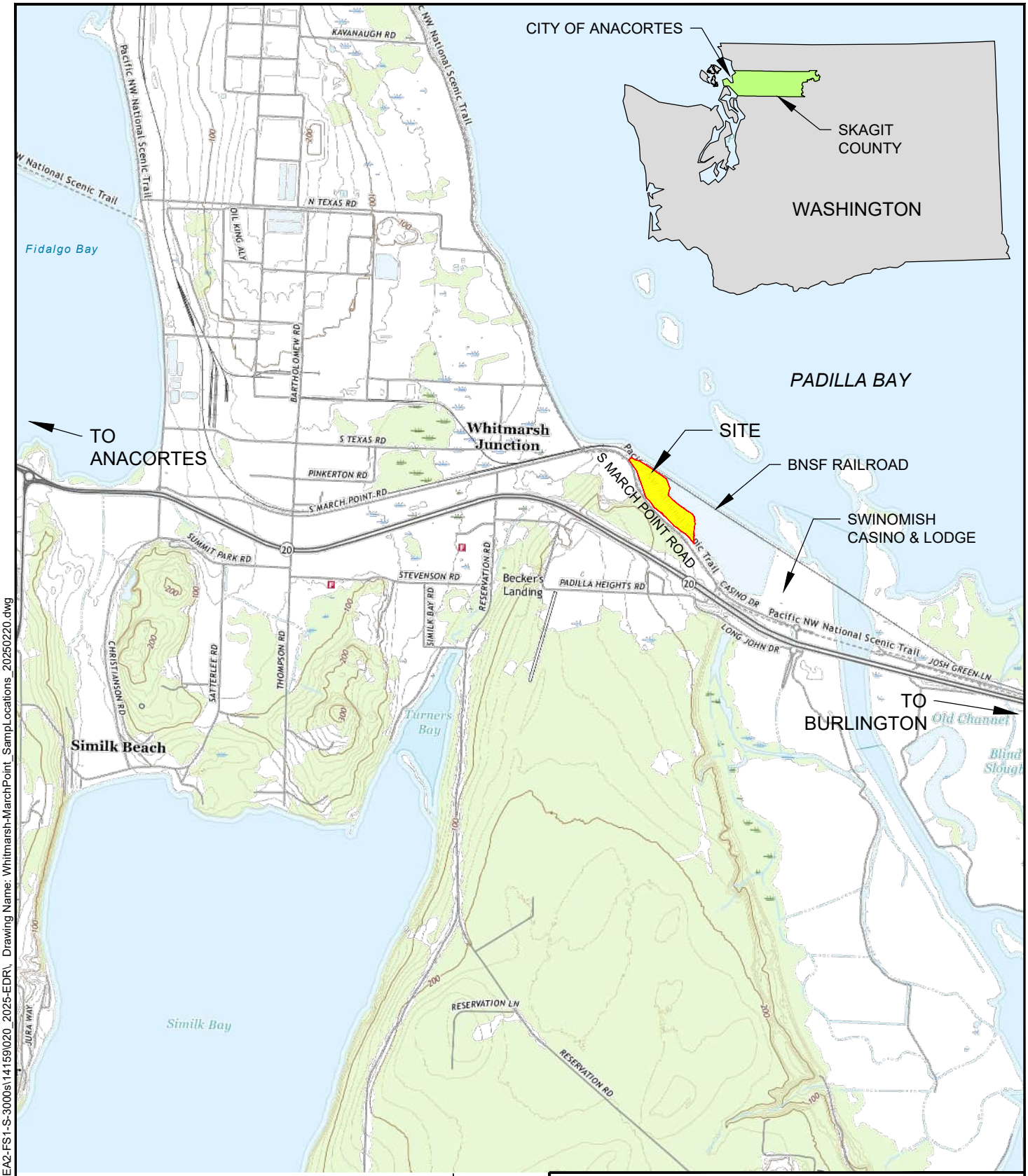
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FIGURES



Base map courtesy USGS, WA_Anacortes_South

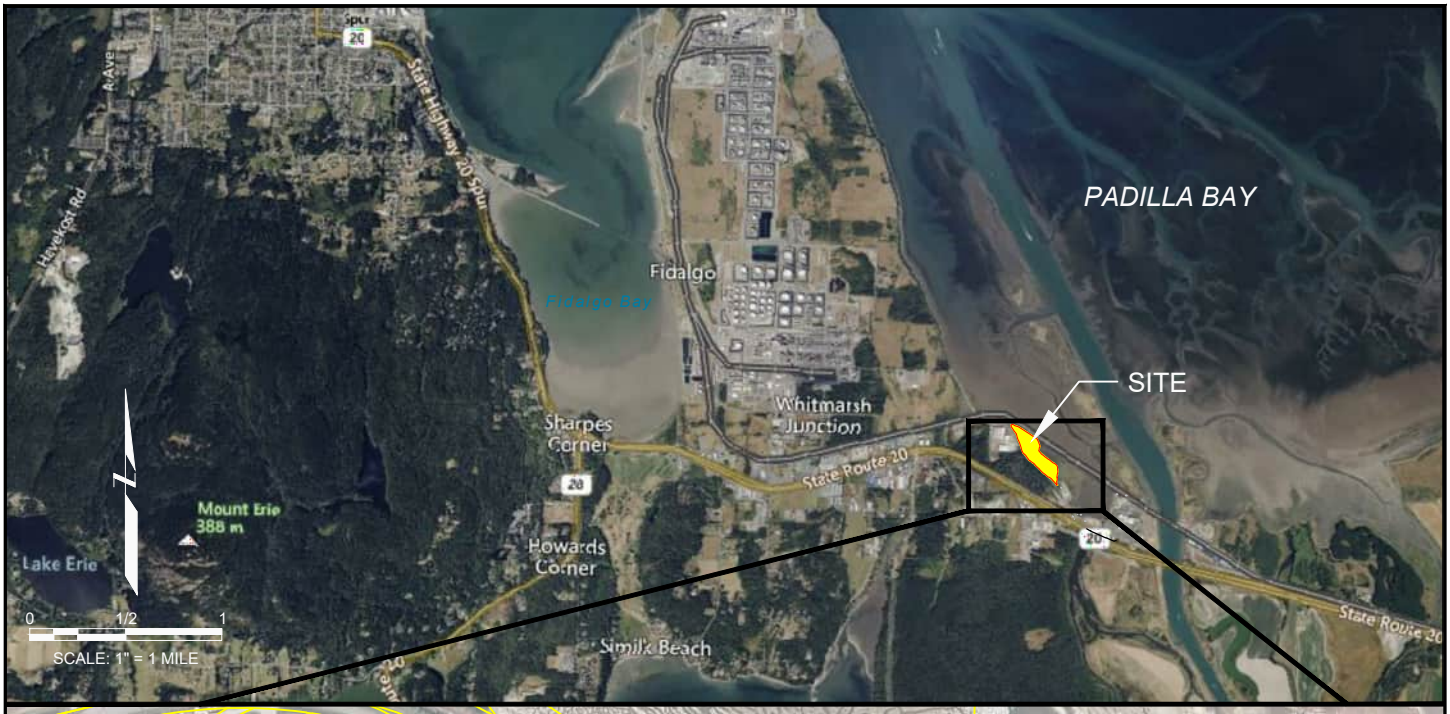
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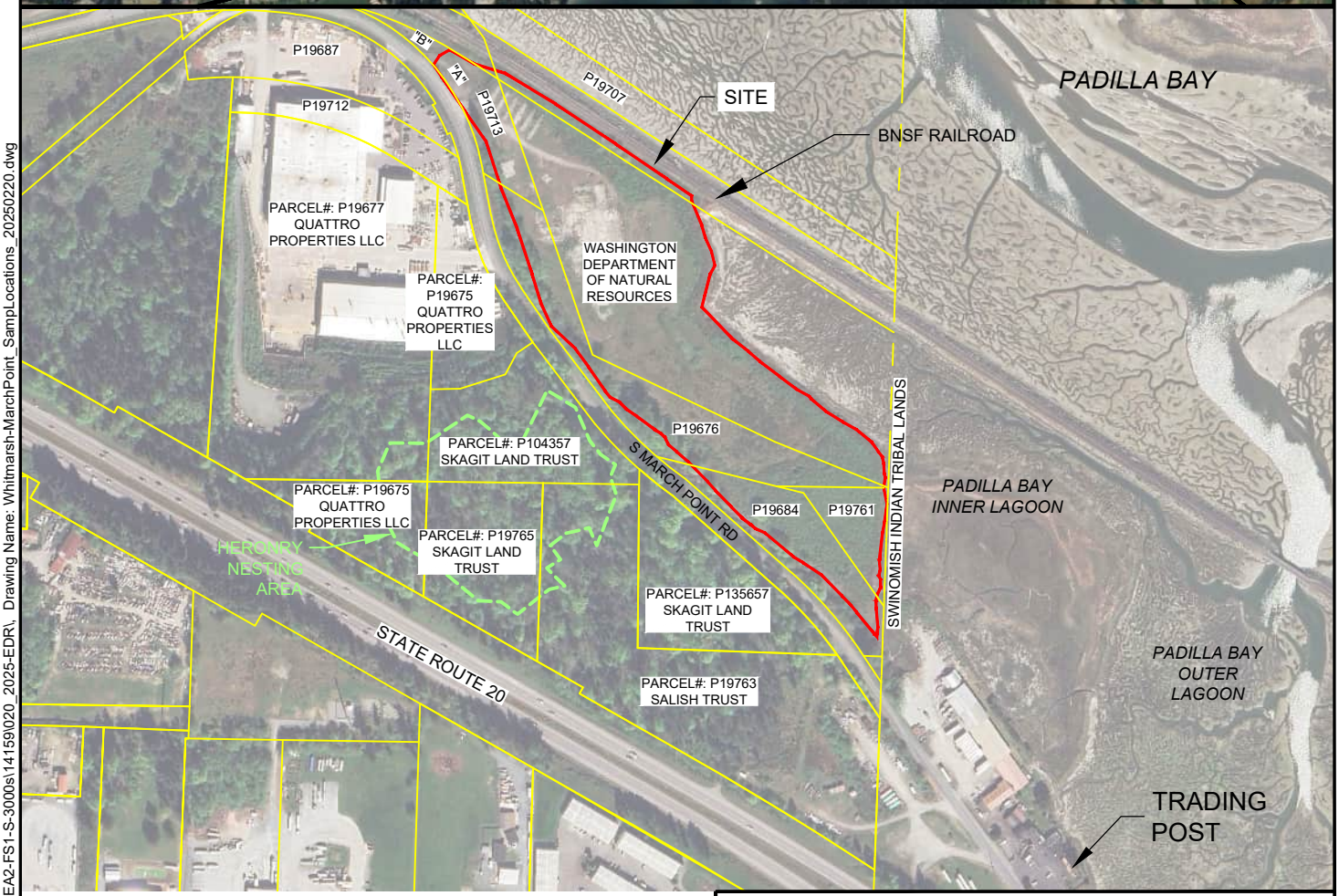
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SITE VICINITY
March Point (Whitmarsh) Landfill
Anacortes, Washington

By: APS	Date: 02/20/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 1

Plot Date: 02/20/25 - 6:09pm, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\020_2025-EDR\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250220.dwg





Aerial Photo Courtesy of Google Earth (April, 2024)

EXPLANATION

APPROXIMATE EXTENT OF SOLID WASTE

PARCEL LINE

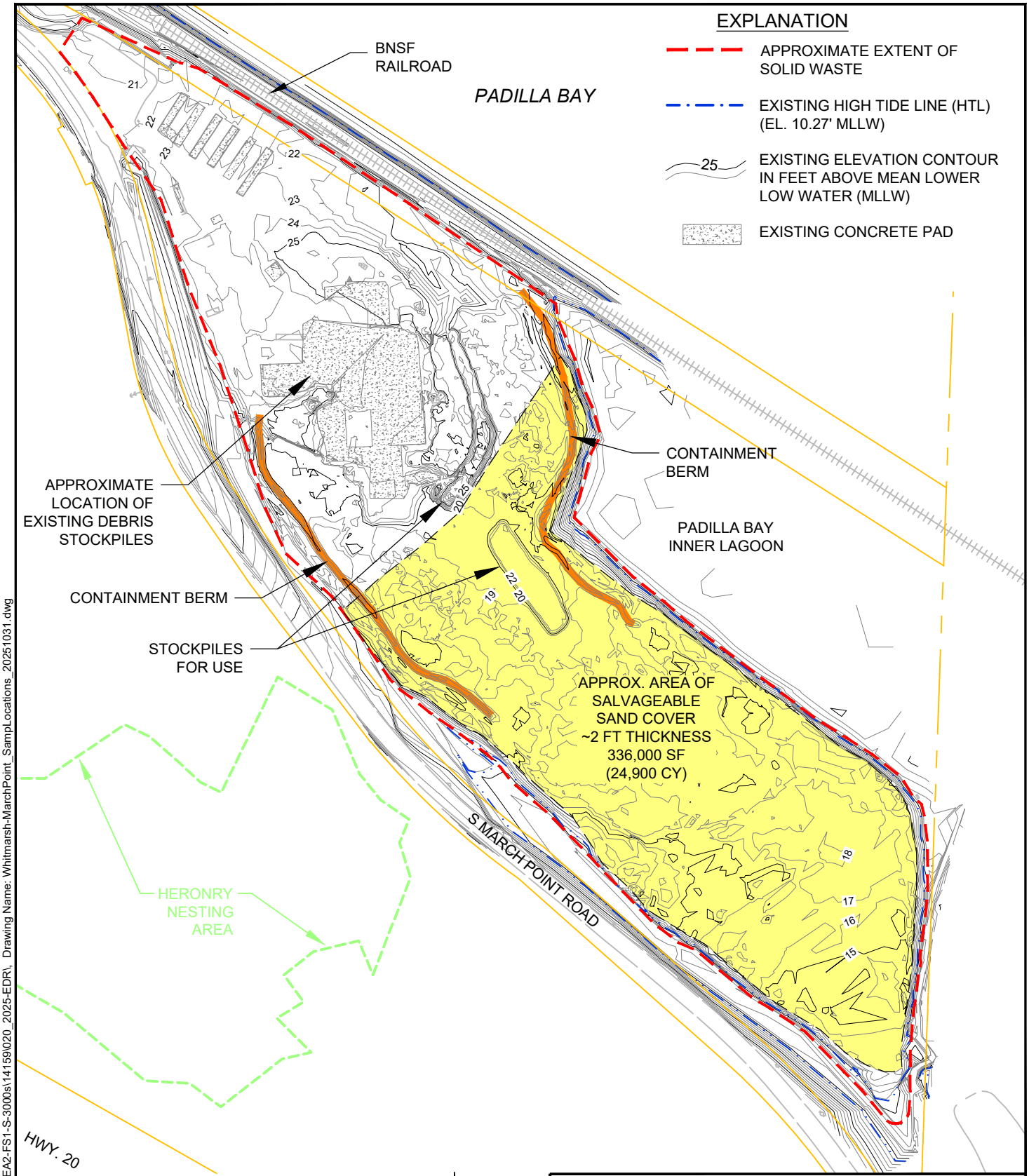
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APPROXIMATE SCALE IN FEET

PARCEL BOUNDARIES
March Point (Whitmarsh) Landfill
Anacortes, Washington

By: APS	Date: 02/20/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 2

Plot Date: 02/20/25 - 6:18pm, Plotted by: USAS719374
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SKAGIT COUNTY WASHINGTON
Serving With Pride

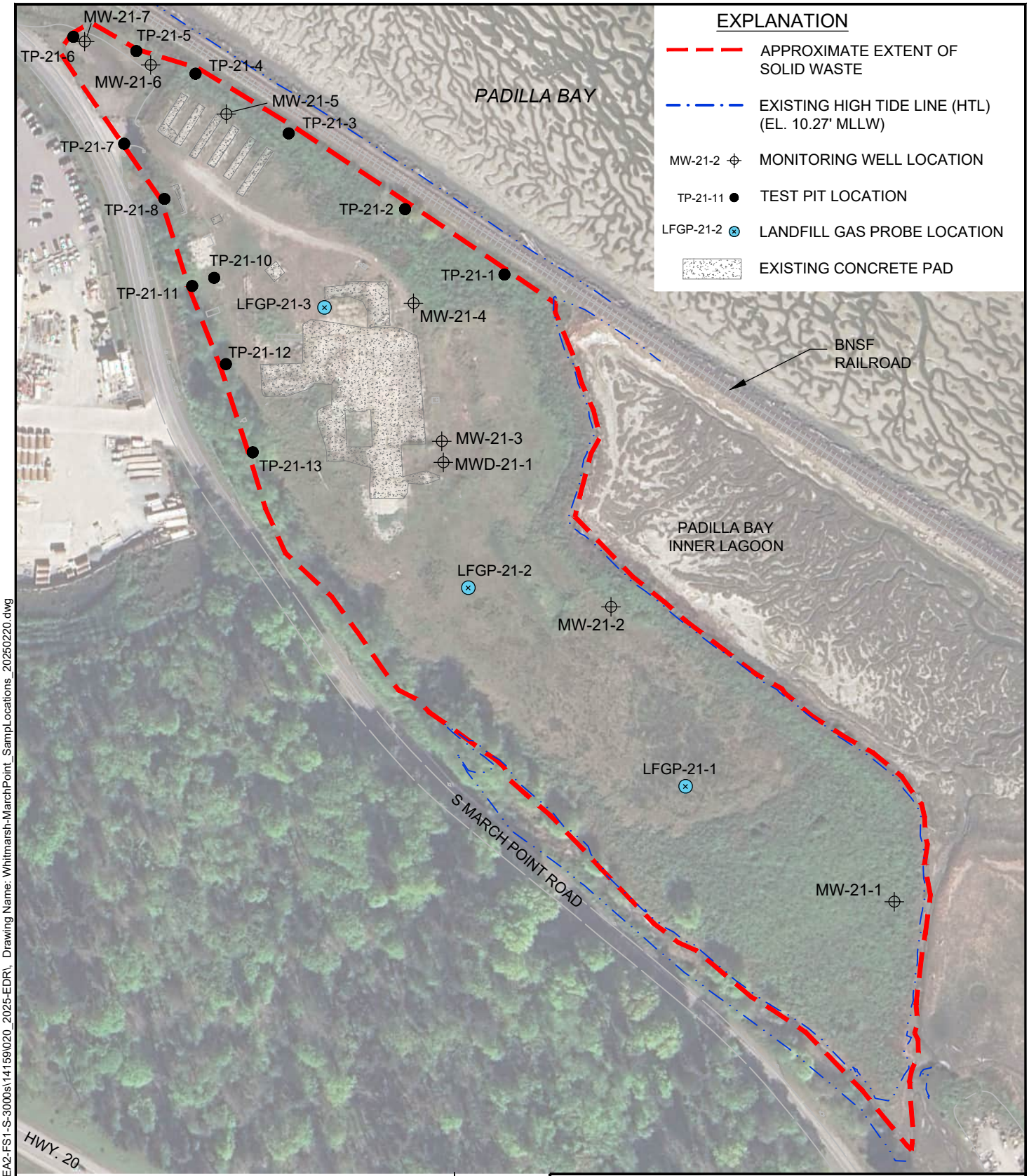
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0 100 200
APPROXIMATE SCALE IN FEET

SITE PLAN
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 10/31/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 3

Plot Date: 10/31/25 - 12:14pm, Plotted by: USAS719374
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Aerial Photo Courtesy of Google Earth (April, 2024)

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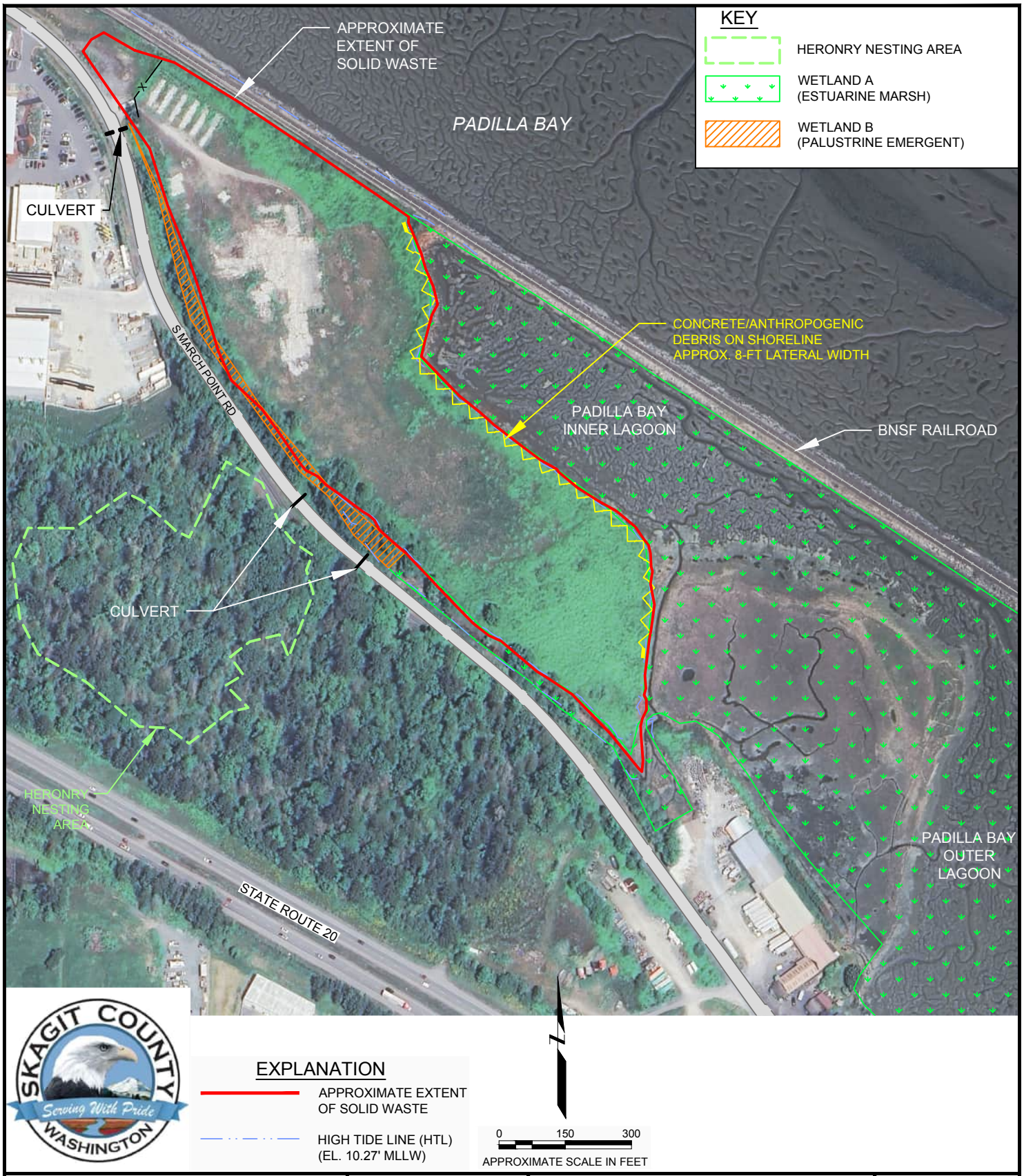
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APPROXIMATE SCALE IN FEET

EXPLORATION LOCATIONS
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/20/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 4

Plot Date: 02/20/25 - 6:21pm, Plotted by: USAS719374
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SKAGIT COUNTY		PROJECT MARCH POINT (WHITMARSH) LANDFILL Anacortes, Washington	DATE DECEMBER 2025
			SCALE AS SHOWN
WSP USA Inc. 18300 Redmond Way, Ste 200 Redmond, Washington 98052		TITLE ENGINEERING DESIGN REPORT WETLANDS LOCATIONS	PROJECT NO. PS21204410
			FIGURE 5

DRAWN BY: APS CHECKED BY: TLP

G:\Whitmarsh\Report Figures\Whitmarsh-MarchPoint_Design-CoverSheet_100523.dwg - Figure 5 EDR - Dec. 26, 2025 1:34pm - USAS719374

TABLES

TABLE 1: Summary of Laboratory Test Results[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Dissolved Metals (µg/L)																			
Arsenic	0.20	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**3.5**	**3.7**	**3.5**	**7.3**	3.0 U	3.0 U
Barium	NA	**47**	**73**	**57**	**36**	**150**	**140**	**190**	**190**	25 U	25 U	**68**	**52**	25 U	25 U	25 U	25 U	25 U	**44**
Cadmium	NA	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Chromium	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	1,000	**430**	**4,800**	**62,000**	**32,000**	**800**	**2,200**	**540**	**620**	**4,400**	**2,700**	**570**	**930 J**	56 U	56 U	56 U	**330**	56 U	**540 J**
Lead	2.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Mercury	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	1.9	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (µg/L)																			
Arsenic	0.20	3.3 U	**6.0**	3.3 U	3.3 U	3.3 U	3.3 U	**6.1**	3.3 U	**5.6**	3.3 U	**4.2**	3.3 U	**4.1**	**4.1**	**3.8**	**8.6**	3.3 U	3.3 U
Barium	NA	**83**	**110**	**96**	**93**	**250**	**250**	**270**	**290**	**64**	**31**	**150**	**120**	28 U	28 U	28 U	**29**	28 U	**130**
Cadmium	NA	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
Chromium	NA	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	**12**	11 U	11 U
Iron	1,000	**12,000**	**17,000**	**85,000**	**79,000**	**20,000**	**22,000**	**17,000**	**14,000**	**16,000**	**9,000**	**17,000**	**17,000**	**900 J**	56 U	**630 J**	**4,600**	56 U	**16,000**
Lead	2.5	**6.5**	1.1 U	**2.8**	1.1 U	**5.0**	1.1 U	**9.4**	1.1 U	**42**	**2.1**	**16**	1.1 U	1.1 U	1.1 U	1.1 U	**1.4**	1.1 U	1.1 U
Mercury	0.20	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	NA	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
Silver	1.9	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
PCBs (µg/L)																			
PCB-aroclor 1016	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1221	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1232	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1242	0.014	0.050 U	0.053 U	**0.057**	**0.11**	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1248	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	5.0 UJ	5.6 UJ	4.8 UJ	4.9 UJ	5.0 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1254	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	0.56 UJ	0.96 UJ	0.49 UJ	0.25 UJ	0.52 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.53 UJ
PCB-aroclor 1260	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 UJ	0.056 U	0.048 UJ	0.049 U	0.050 UJ	0.052 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.053 U
Pesticides (µg/L)																			
4,4'-DDD	0.0013	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.59**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
4,4'-DDE	0.0013	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	**0.0073**	**0.23 J**	**0.20**	**0.70**	**0.49 J**	**0.32 J**	**0.67 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.68 J**
4,4'-DDT	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.01 J**	**0.014 J**	0.048 U	**0.38**	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.17 J**
Aldrin	NA	0.0020 U	0.0021 U	0.0020 U	0.0021 U	0.0020 U	0.0020 U	**0.33 J**	**0.43 J**	**0.22 J**	**0.68 J**	**3.2 J**	**2.1 J**	**0.0022 J**	**0.0028**	0.0020 U	0.0020 U	0.0020 U	**2.5 J**
alpha-BHC	0.00060	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.0073**	0.048 U	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
alpha-Chlordane	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.28 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
beta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.058**	0.049 U	**0.10 J**	0.10 U	0.0053 U	**0.0061 J**	0.0051 U	0.0050 U	0.0049 U	0.11 U
delta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.0061 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.067**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Dieldrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.086 J**	**0.086 J**	0.050 U	**0.22 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.26 J**
Endosulfan I	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.052 J**	0.0056 U	**0.21 J**	0.049 U	**0.44 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Endosulfan II	NA	0.0050 U	**0.0058**	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.048**	**0.048 J**	**0.83**	**0.27 J**	0.050 U	**0.27 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.23 J**
Endosulfan Sulfate	NA	0.0050 U	0.0053 U	0.0050 U	**0.0074 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.060 J**	**0.12**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.13 J**
Endrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.061 J**	0.048 U	**0.34 J**	0.050 U	**0.61**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.63**
Endrin Aldehyde	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.011**	**0.19 J**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.11 J**
Endrin Ketone	NA	0.020 U	0.021 U	0.020 U	0.021 U	0.020 U	0.020 U	0.020 U	0.022 U	0.19 U	0.20 U	0.20 U	0.41 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.42 U
gamma-BHC (Lindane)	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.056**	0.049 U	**0.069 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
gamma-Chlordane	NA	0.0050 U	0.0053 U	**0.011**	**0.012**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**1.1 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.054 J**	1.0 UJ	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor Epoxide	NA	0.0030 U	0.0032 U	0.0030 U	0.0032 U	0.0031 U	0.0030 U	0.0030 U	**0.089 J**	**0.14 J**	**0.093 J**	**0.37 J**	**0.29 J**	0.0032 U	0.0030 U	0.0030 U	0.0030 U	0.0029 U	**0.34 J**
Methoxychlor	NA	0.0099 U	0.011 U	0.0099 U	0.011 U	0.01 U	0.01 U	**0.014 J**	0.011 U	0.097 U	**0.11 J**	0.10 U	0.21 U	0.011 U	0.0099 U	0.01 U	0.01 U	0.0098 U	0.21 U
Toxaphene	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 U	0.056 U	0.48 U	0.49 U	0.50 U	1.0 U	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	1.1 U

TABLE 1: Summary of Laboratory Test Results[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Semivolatile Organic Compounds (µg/L)																			
(3+4)-Methylphenol (m,p-Cresol)	NA	1.0 U	1.0 U	0.98 U	**1.0**	**1.5**	0.99 U	1.0 U	1.0 U	**11**	**28**	**1,700**	**56**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**70**
1,2,4-Trichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Diphenylhydrazine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dichlorobenzene	NA	1.0 U	**1.2**	**3.5**	**3.1**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1-Methylnaphthalene	1.51	--	--	**10**	**9.0**	--	--	--	--	**3.4**	--	**14**	**3.5 J**	--	--	--	--	--	**5.4 J**
2,3,4,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**5.7**	1.3 UJ	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.6 UJ
2,3,5,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,3-Dichloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4,5-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.4**	**2.3**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**3.2**
2,4,6-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dimethylphenol	380	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**130**	**140**	**3,100**	**470**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**590**
2,4-Dinitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	8.0 U	5.1 U	4.8 U	4.9 U	8.1 U	5.0 U	4.8 U	5.1 U
2,4-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,6-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chloronaphthalene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Methylnaphthalene	NA	--	--	**5.6**	**4.5**	--	--	--	--	**2.6**	**1.1**	**16**	**3.7 J**	--	--	--	--	--	**6.6 J**
2-Methylphenol (o-Cresol)	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**7.2**	**20**	**1,300**	**51**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**60**
2-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Nitrophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3,3'-Dichlorobenzidine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4,6-Dinitro-2-methylphenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	7.3 U	5.1 U	4.8 U	4.9 U	7.4 U	5.0 U	4.8 U	5.1 U
4-Bromophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloro-3-methylphenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chlorophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Acenaphthene	NA	--	--	**2.1**	**1.6**	--	--	--	--	--	--	**1.0**	--	--	--	--	--	--	--
Acenaphthylene	NA	--	--	--	--	--	--	--	--	**1.4**	--	--	--	--	--	--	--	--	--
Aniline	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Benzidine	NA	5.0 U	--	4.9 U	--	5.1 U	--	5.0 U	--	5.0 U	--	5.0 U	--	4.8 U	--	5.1 U	5.0 U	--	--
Benzyl alcohol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethoxy)methane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroisopropyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Ethylhexyl)phthalate	1.2	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
bis-2-Ethylhexyladipate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Butylbenzylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Carbazole	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dibenzofuran	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Diethylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dimethylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-butylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-octylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Fluorene	NA	--	--	**1.5**	**1.0**	--	--	--	--	--	--	**1.6**	**1.0**	--	--	--	--	--	**1.3**
Hexachlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorobutadiene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorocyclopentadiene	NA	1.0 U	1.3 U	0.98 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.3 U	1.3 U	0.96 U	1.3 U	1.3 U	1.0 U	1.2 U	1.3 U
Hexachloroethane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Isophorone	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Naphthalene	NA	--	--	--	--	--	--	--	--	**1.4**	--	**19**	**4.9 J**	--	--	--	--	--	**9.5 J**
Nitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodimethylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitroso-di-n-propylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodiphenylamine	NA	1.0 U	1.0 U	1.8 UJ	**1.3**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pentachlorophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	**80**	**21 J**	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	**26**
Phenanthrene	NA	--	--	**1.4**	**1.1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**1.8**	**7.8**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pyridine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U

TABLE 1: Summary of Laboratory Test Results[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Polycyclic Aromatic Hydrocarbons (µg/L)																			
1-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	**0.23**	**0.33**	--	**0.78**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
2-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	--	--	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Acenaphthene	NA	**0.23**	**0.45**	--	--	**0.15**	**0.14**	**0.23**	**0.28**	0.21 UJ	0.097 U	--	**0.43 J**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.68 J**
Acenaphthylene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	--	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.12 UJ
Anthracene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Benz[a]anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.031**	0.015 UJ	**0.057**	0.014 UJ	0.0096 UJ	0.0098 U	**0.011 J**	**0.013**	0.0095 U	0.01 U
Benzo(a)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.028**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.012 J**	**0.014**	0.0095 U	0.01 U
Benzo(b)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.034**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.016 J**	**0.015**	0.0095 U	0.01 U
Benzo(ghi)perylene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.016**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.011 J**	0.01 U	0.0095 U	0.01 U
Benzo(j,k)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.011**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Chrysene	0.01	0.01 U	0.01 U	**0.011**	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.16**	0.0097 U	**0.057**	0.01 U	0.0096 UJ	0.0098 U	**0.021 J**	**0.015**	0.0095 U	0.01 U
Dibenzo(a,h)anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	0.01 U	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Fluoranthene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 UJ	0.19 UJ	0.62 U	0.23 UJ	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.29 UJ
Fluorene	NA	**0.27**	**0.34**	--	--	0.10 U	0.099 U	**0.14**	0.10 U	**0.31**	0.097 U	--	--	0.096 U	0.098 U	0.10 U	**0.11**	0.095 U	--
Indeno(1,2,3-cd)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.014**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Naphthalene	NA	**0.10**	0.10 U	**0.33**	**0.22**	0.10 U	0.099 U	0.10 U	0.10 U	--	**0.69**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Phenanthrene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	**0.25**	0.097 U	0.50 U	**0.33**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.35**
Pyrene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Total cPAHs TEQ	NA	0.00755	0.00755	**0.00801**	0.00755	0.00755	0.00747	0.00755	0.00755	**0.0550**	0.00997	**0.0730**	0.00955	0.00725	0.00740	**0.0170**	**0.0185**	0.00717	0.00755
Volatile Organic Compounds (µg/L)																			
Benzene	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.3**	**7.8**	**4.3**	1.0 U	4.0 U	**18**	**8.6 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**14 J**
Miscellaneous																			
Conductivity (µmhos/cm)	NA	--	**2,000**	--	**590**	--	**610**	--	**630**	--	**330**	--	**510**	--	**520**	--	--	**540**	**520**
Salinity (g/kg)	NA	--	**0.95**	--	**0.27**	--	**0.28**	--	**0.29**	--	**0.15**	--	**0.24**	--	**0.24**	--	--	**0.25**	**0.24**
pH (SU)	NA	**6.9**	**6.6**	**8.6**	**6.4**	**7.2**	**6.9**	**7.0**	**7.2**	**6.5**	**6.6**	**7.1**	**7.1**	**7.0**	**6.8**	**6.9**	**6.5**	**8.2**	**7.1**

Notes
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = Reported value is an estimate.
   UJ = The analyte was not detected at the estimated reporting limit indicated.
2. **Bolded** values are detections, yellow highlighted cells are PQLs exceedances

Abbreviations
-- = analyte was not detected
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter
BHC = benzene hexachloride
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
DUP = duplicate
g/kg = grams per kilogram
NA = not available
PCBs = polychlorinated biphenyls
PCL = practical quantitation limit
SU = standard units
TEQ = toxic equivalency quotient

Table 2: Groundwater Levels
Whitmarsh Landfill
Anacortes, Washington
US0041081.0037

Moniting Well Identification	Ground Surface Elevation	Top of PVC Casing Elevation	Oct-21		1/26/2022 Before Sampling		1/27/2022 After Sampling	
			Depth to Groundwater	Groundwater Elevation	Depth to Groundwater	Groundwater Elevation	Depth to Groundwater	Groundwater Elevation
MW-21-1	15.5	19.4	12.0	7.4	11.1	8.3	12.0	7.4
MW-21-2	16.9	20.9	10.9	10.0	9.7	11.2	10.8	10.1
MW-21-3*	19.5	23.3	9.6	13.8	9.3	14.0	9.3	14.0
MWD-21-1*	19.2	22.3	11.9	10.5	10.4	11.9	10.5	11.8
MW-21-4	25.7	28.3	14.6	13.7	14.2	14.1	14.3	14.1
MW-21-5	22.1	25.0	9.5	15.5	8.3	16.7	8.8	16.2
MW-21-6	21.4	24.1	8.6	15.6	7.9	16.2	8.0	16.1
MW-21-7	21.2	24.0	5.4	18.6	5.8	18.3	5.8	18.2

Note:
* The wells are a pair.
1. Vertical elevations are in Mean Lower Low Water (MLLW) datum.

Table 3: Landfill Gas Readings
Whitmarsh Landfill
Anacortes, Washington
US0041081.0037

Compound	Monitoring Probe Identification		
	LFPG-21-1	LFPG-21-2	LFPG-21-3
	27-Jan-22		
Carbon Monixide (CO)	0.0	0.0	0.0
Hydrogen Sulfide (H2S)	0.0	8.8	29.2
Oxygen (O)	8-13	0.7	2.1
Lower Explosive Level (LEL)	0.0	>99	>99
	21-May-22		
Carbon Monixide (CO)	NR	0.0	0.0
FID	NR	High	>10,000
Oxygen (O)	NR	6.0	18-21
Lower Explosive Level (LEL)	NR	>99	13.0

Notes:
1. Four gas meter was used in January and an FID was used in May.
2. FID = Flame Ionization Detector
3. NR-Not Read. Probe not found
4. Units of th values are in percentage, except FID, which is in parts per million (ppm).
5. Ambient air readings immediately next to the probe were normal.

Table - 4: Project Quantities
Whitmarsh Landfill
Anacortes, Washington

Description	Qauntity	Units
Existing Landfill Area	16.7	Acre
Existing Limit of Waste	15.3	Acre
Final Landfill Area	691,868	SF
	15.9	Acre
Cap Area	630,428	SF
	14.5	Acre
Sand-Covered Area below the HTL	1.4	Acre
Temporary Erosion Control Measures		
Temporary Fencing	3,162	LF
Turbidity Curtain	1,526	LF
Silt Fence/Straw Wattle	1,100	LF
Earthwork		
Total Quantity of Excavation	64,420 CY	CY
Existing Sand Salvage and Reuse	14,700	CY
Waste Excavation	49,720	CY
Saturated Volume of Excavated Material	13,426	CY
Estimated Volume of Water (Porosity 0.4)	5,370	CY
One pore volume	1,085,000	Gallons
Total Quantity of Backfill	64,780 CY	CY
Import Material		
Backfill for Sand Drains	16,300	CY
	26,000	Tons
Select Borrow	23,350	CY
	41,000	Tons
Common Borrow	23,350	CY
	34,000	Tons
Topsoil	10,400	CY
	62400	SY
Crushed Rock Surfacing	47,533	SF
	880	CY
	1,585	Tons
RailRoad Ballast	18,532	SF
Area	18,532	SF
Volume	687	CY
Weight	1,235	Tons
Geosynthetics		
GCLL Area	486,946	SF
	11.2	Acre
GCLL Enhanced Area	143,482	SF
	3.3	Acre
Geotextile	1,440,000	SF
LFG Collection Piping	4,305	LF
LFG Vents	19	Ea
Other		
Habitat Area		SF
		Acre
Access Road Length	3,572	LF
Access Road Surface Area	61,991	SF
Compost Berm	13,562	LF
	505	CY
Permanent Fence	4,335	LF
Gates	6	Ea

Abbreviations:
CY = Cubic yards
Ea = Each
LF = Linear Feet
SF = Square feet

Table - 5: Sectional Earthwork Volumes
Whitmarsh Landfill
Anacortes, Washington

Section	Volume (CY) Cut (-) and Fill	Area (SF)
May 1st to 15th		
Excavation west of gate	-4,125	13,993
mound cut to EL 21	-638	8,224
RR ditch north of excav	-1,059	5,371
RR to EL. 11 new swale	-6,250	12,941
EL 11 to EL 17	-1,072	3,345
EL 17 to EL 20	-1,943	12,004
May 15th to 31st		
RR to EL 11 new swale	-17,235	41,934
EL 11 to EL 17	-3,323	12,737
EL 17 to EL 20	-2402 and 124	15,083
June 1st to 15th		
inner lagoon to EL 11	-4,424	20,256
EL 11 to EL 16	-2,140 and 8	13,551
EL 16 to EL 20	-519 CY and 775	22,551
June 15th to 30th		
inner lagoon to El 11	-3,877	19,273
El 11 to El 16	-1,373 and 7	13,143
El 16 to EL 20	-18.45 and 1,248	18,674
July 1st to 15th		
Inner Lagoon to EL 11	-2,916 and 72	24,319
EL 11 to EL 16	-204 and 17	3,513
EL 16 to EL 20	359	2,760
July 15th to 30th		
South Ditch to EL 11	-2,595 and 67	20,621
EL 11 to EL 16	-710 and 86	10,267
EL 16 to EL 20	-26 CY and 2,080	20,376
August 1st to 15th		
South Ditch to EL 20	-4,280 and 1,272	64,790
EL 20 to Peak	-3,930 and 58,657	324,775

APPENDIX A

PRE-DESIGN INVESTIGATION INFORMATION

wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 15.5-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538716.06 **EASTING** 1228719.51

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-1		COVER SOIL: Course sandy material mixed with roots; approximately 2-feet
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 4.0 feet. Terminated as consistent household garbage was encountered and no further need dig beyond was determined.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-2

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 17.9-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538813.13 **EASTING** 1228571.87

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-2		COVER SOIL: Course sandy material mixed with roots; approximately 2-feet
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 5.0 feet. Terminated when the extent of the railroad bed was found which was near the bottom of the slope of the berm.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-3

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 20.7-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538925.64 **EASTING** 1228399.04

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-3		COVER SOIL: Course sandy material mixed with roots; approximately 2-feet
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 5 feet. Terminated when the extent of the railroad bed was found which is located just at the toe of the slope of the berm on-site.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-4

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 20.8-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 539014.31 **EASTING** 1228260.68

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-4		COVER SOIL: Course sandy material mixed with roots; approximately 2-feet
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 4.5 feet. Terminated prior to finding the extent of the railroad bed due to adjacent water-filled ditched that runs along the berm.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-5

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 20.6-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 539047.96 **EASTING** 1228172.84

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-5		COVER SOIL: Course sandy material mixed with roots and gravel; adjacent berm was completely clean soil all the way down. On the south side of the berm cover soil account for approximately 3.5-feet prior to encountering debris.
5			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
10			Bottom of test pit at 6.0 feet on the south side the berm and test pit was terminated when continued debris was found. Terminated at 5.0 feet on the north side of the berm when the extent of the railroad bed was found of the toe of the slope of the berm; additionally running along the berm was a water-filled ditch.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-6

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 20.4-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 539069.21 **EASTING** 1228079.26

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-6		COVER SOIL: Course sandy material mixed with gravel; adjacent berm is completely clean soil all the way down; approximately 4-feet in depth.
5			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
			Bottom of test pit at 5.0 feet. Terminated upon encountering groundwater.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-7

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 21.1-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538910.28 **EASTING** 1228154.67

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-7		COVER SOIL: Course sandy material mixed with gravel; approximately 4-feet in depth.
5			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
			Bottom of test pit at 5.0 feet. Terminated upon encountering debris and to avoid potentially impacting adjacent utilities near the location.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-8

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 22.2-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538828.36 **EASTING** 1228214.57

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-8		COVER SOIL: Course sandy material mixed with roots; dug as close to the adjacent ditch as we could; approximately 3-feet in depth.
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 5.0 feet. Terminated upon encountering the extent of the debris.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-9

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 21.9-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538774.03 **EASTING** 1228242.92

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-9		COVER SOIL: Course sandy material mixed with roots; approximately 2.5-feet in depth.
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 4.0 feet. Terminated upon encountering the extent of the debris.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-10

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 23.7-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538711.19 **EASTING** 1228288.3

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-10		COVER SOIL: Course sandy material mixed with roots; approximately 3-feet in depth.
5			SOIL: Gray-tinged soil, with black tar that could indicate that the soil contains asphalt or diesel products.
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
10			Bottom of test pit at 9.0 feet. Terminated upon encountering the extent of the debris.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-11

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 22.4-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538699.03 **EASTING** 1228255.65

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-11		COVER SOIL: Course sandy material mixed with roots; approximately 3-feet in depth.
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
5			Bottom of test pit at 4.0 feet. Terminated upon encountering the extent of the debris.
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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-12

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 22.2-feet

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538582.98 **EASTING** 1228305.88

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0	TP-21-12		COVER SOIL: Course sandy material mixed with roots; approximately 4-feet in depth.
5			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
			Bottom of test pit at 5.0 feet. Terminated upon encountering the extent of the debris.
10			
15			
20			
25			
30			
35			

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wood.

PROJECT NAME Skagit Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **TEST PIT NUMBER** TP-21-13

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 9/21/21 **COMPLETED** 9/21/21 **GROUND ELEVATION** 17.9-feet MLLW

DRILLING CONTRACTOR Welch Brothers Construction **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Cheyenne Ginther **CHECKED BY** Cheyenne Ginther **NORTHING** 538452.01 **EASTING** 1228345.63

NOTES _____ **GW LEVEL (ATD)** _____

DEPTH (ft)	SAMPLE TYPE NUMBER	GRAPHIC LOG	MATERIAL DESCRIPTION
0			COVER SOIL: Course sandy material mixed with roots; approximately 0.5 to 1-foot in depth; no sample taken due to the lack of cover soil found at this location.
			HOUSEHOLD GARBAGE: plastics, paper, cardboard, and other debris inter-bedded with soil.
			Bottom of test pit at 3.0 feet. Terminated upon encountering the extent of the debris.
5			
10			
15			
20			
25			
30			
35			

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 15.5-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 15"				No hits on LEL, VoCs, etc.
		Sand and trash	3'			
		No cuttings				
5		Bentonite Chips 1 Bag	8'			
			9'			
10		6 bags of 10-20 sand →				
15		2" well screen 10-feet →				
		Water encountered ~16-feet BGS				
			19'			
20		End of Boring at 19-feet.				
		Aboveground monument.				
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-2

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 16.9-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 18"				No hits on LEL, VoCs, etc.
		Gray sand, some silt, some trash				
5		Bentonite Chips → 2 Bags				
			8'			
10		Gray sand, some silt, some trash				
		7 bags of 10-20 sand →				
		Water first encountered at 15-feet, but no accumulation. Waited 5 minutes at 21.5-feet +/-				
15		2" screen - 15 feet depth				
20			23'			
		End of Boring at 23-feet.				
25		Aboveground monument.				
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-3

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 19.5-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown Sand - 6"				No hits on LEL, VoCs, etc.
		Gray silty sand; no discernible trash in cuttings	4'			
5			5'			
		Wet FR 7-feet +/-				
		Less silt with depth.				
10		5 bags of 10-20 sand →				
		2" Screen - 10-feet depth				
15			15'			
		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-4

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 25.7-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling -Offset boring 25-feet east **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 6"				No hits on LEL, VoCs, etc.
		Gray-brown sand and gravel - 1.5-feet				
5		Gray-brown gravelly sand, TR silt (rounded gravel)				
			9'			
10			10'			
		Dark gray silty sand Moist - a few pieces of trash				
		6 bags of 10-20 sand →				
15		Water at 14-feet +/-				
		2" Screen - 10-feet depth				
			20'			
20		End of Boring at 20-feet.				
		Aboveground monument.				
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-5

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 22.1-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown sand - 1.5-feet				No hits on LEL, VoCs, etc.
		Brown sand, some silt, trace gravel	4'			
5		Gravel 5-feet to 6 -feet hard drilling				
		Brown gray silty sand, some gravel — No bentonite — Grout seal				
10		Brown sand, some silt, moist/wet — 7 bags of 10-20 sand → — 2" Screen - 10-feet depth	14'			
15		End of Boring at 15-feet.				
		Water rose up to approximately 6-feet BGS, after 5 minutes.				
20		Aboveground monument.				
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-6

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/12/21 **COMPLETED** 10/12/21 **GROUND ELEVATION** 21.4-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand and gravel				No hits on LEL, VoCs, etc.
		Gray silty sand or sand/silt; trash; some sheen noted, some odor				
5		Similar to MW-21-5	5'			
			Sand →			
		Water encountered around 9 to 10 feet				
10		7 bags of 10-20 sand →				
		2" Screen - 10-feet depth				
15			15'			
		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-7

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/12/21 **COMPLETED** 10/12/21 **GROUND ELEVATION** 21.2-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand and gravel - 1 to 1.5 feet				No hits on LEL, VoCs, etc.
		Gray sand, some silt, trace gravel	5'			
5						
		Water around 9 to 10 feet				
10		Gray sand, some gravel, some silt — 7 bags of 10-20 sand				
		2" Screen - 10-feet depth	15'			
15		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MWD-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/26/21 **COMPLETED** 10/26/21 **GROUND ELEVATION** 19.2-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Geoprobe 8140 LC **SPT HAMMER EFFICIENCY**

DRILLING METHOD **STATION (FT)** **OFFSET (FT)**

LOGGED BY Cherie Howland **CHECKED BY** **NORTHING** **EASTING**

NOTES BNP 334 Well Tag ID **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Medium gray fine-medium sand with debris (glass, wood); moist				No hits on LEL, VoCs, etc.
		dk brown clay moist - 2- to 2.5-feet	100%			
5		Medium gray fine-medium sand, some fine to course gravels moist.				
10		dk gray silty sand, fine to course; some organics & debris, wet	100%			
15		No recovery	100%			
20		dk gray, fine to course, sand with fine to course gravels sat.	0%			
		dk gray clay, some fine sand, wet	100%			
25		Medium gray fine gravels with sand, fine to course, and some course gravels sat.				
30		Medium gray, fine to course, sand, some fine gravel sat.	100%			
		Medium gray, silty sand, some fine gravel sat.	100%			
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MWD-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
35						Screened at 35 to 45-feet within the last 10-feet of the well.
		Medium gray, clayey silty sand, some fine gravel sat.	80%			
40		Medium gray, fine sand, some shells, wet.	80%			
45		End of Boring at 45-feet.				
		Aboveground monument.				
50						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 15.1-feet **HOLE SIZE** 4"+ 10

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 8"				No hits on LEL
		Silty sand and trash	2'			
		2-feet solid riser				
		1" screen at 5-feet				
5		10-20 sand 2 bags	7'			
10		Water encountered at 12-feet +/- Then rose up boring pit ~6.5-feet BGS				
		End of Boring at 13-feet. Terminated due to water level.				
15		Flush monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-2

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 18.3-feet **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown Sand - 18"	2'			No hits on LEL
		Gray silty sand — 1" screen at 5-feet				
5		Encountered cobbles (>) from 4-feet to 6-feet — 10-20 sand 5 bags	7'			
		Cuttings moist - no static water				
10		Down to 10-feet				
		End of Boring at 10-feet.				
		Flush monument.				
15						
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-3

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** _____ **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY** _____

DRILLING METHOD HSA 8" +/- **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Koorus Tahghighi **CHECKED BY** _____ **NORTHING** _____ **EASTING** _____

NOTES No Sampling **GW LEVEL (ATD)** _____

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown-gray sand & gravel - 1-foot				No hits on LEL
		Gray sand - some silt				
		Trace gravel	4'			
5		1" screen at 5-feet 10-20 sand bags →				
		Water ~10.8-feet to 11-feet	9'			
10		Gray silty sand - moist				
		End of Boring at 12-feet.				
15		Flush monument.				
20						
25						
30						
35						

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GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW-21-1 LOCATION: Whitmarsh PROJECT NO: PS21204410.02

DATE: 1/26/22 TIME: 1137 CLIMATIC CONDITIONS: Overcast

OVA/PID READING WHEN WELL OPENED: DEPTH TO PRODUCT (TOC):

STATIC WATER LEVEL (TOC): 11.12 TOTAL DEPTH OF WELL (TOC): 19.98

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE:

WELL PURGE DATA	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO ~~(mg/L)~~ %	REDOX (mv)
	11.19	1139	0.125	9.7	6.41	1.374	7.59	15.5	-100.1
	11.19	1142	0.25	9.3	6.40	1.581	2.75	7.0	-116.5
	11.20	1146	0.375	9.5	6.42	1.714	1.55	5.1	-123.6
	11.20	1150	0.5	9.6	6.43	1.735	1.27	4.3	-126.2
	11.20	1154	0.625	9.7	6.43	1.749	1.22	3.8	-128.1
	11.21	1158	0.75	10.0	6.43	1.744	1.28	3.4	-129.8
	11.22	1202	0.875	10.2	6.44	1.785	1.35	3.1	-132.2
	11.23	1206	1.0	10.2	6.44	1.786	1.44	2.9	-133.9
	11.23	1210	1.125	10.2	6.44	1.795	1.67	2.8	-134.9

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland C

SAMPLE NUMBER(S) AND TIME: MW21-1-012622 1212

NOTES:

LAB ANALYSIS PARAMETERS AND PRESERVATIVES:

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Amber 2 voa vials 1 Nitric Poly 2- unpreserved polys

DECON. PROCEDURES: New tubing, distilled water, Alconox, paper towels

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: C. Gunther

DATE: 1/28/22 TIME:

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW21-2 LOCATION: Whitmarsh PROJECT NO: PS21204410.02

DATE: 1/26/22 TIME: 12:48 CLIMATIC CONDITIONS: Sunny

OVA/PID READING WHEN WELL OPENED: DEPTH TO PRODUCT (TOC):

STATIC WATER LEVEL (TOC): 9.75 TOTAL DEPTH OF WELL (TOC): 18.67

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE:

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO ~~(mg/L)~~ %DO	REDOX (mv)
PURGE DATA	9.75	1250	0.125	10.8	6.36	0.764	55.96	7.3	-121.5
	9.75	1254	0.25	10.4	6.32	0.763	273.74	4.1	-120.8
	9.75	1258	0.375	10.6	6.31	0.762	375.1	3.4	-122.7
	9.75	1302	0.5	10.5	6.31	0.768	117.81	3.1	-124.2
	9.75	1306	0.625	10.4	6.31	0.768	155.61	3.0	-124.8
	9.75	1310	0.75	10.5	6.31	0.769	227.85	2.8	-125.5
	9.75	1314	0.875	10.4	6.31	0.767	276.32	2.8	-125.5
	9.75	1318	1.0	10.6	6.31	0.764	241.38	2.6	-126.4

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland CGintler

SAMPLE NUMBER(S) AND TIME: MW21-2-012622 1320

NOTES: Looks clear although turbidity is high

LAB ANALYSIS PARAMETERS AND PRESERVATIVES:

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Ambers unpreserved, 3-40ml VOA vials HCL 1-500ml poly-unpreserved, 1-500ml poly nitric acid preserved

DECON. PROCEDURES: New tubing, Alconox, Distilled Water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: CGintler

DATE: 1/28/22 TIME:

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MWD-1 LOCATION: Whitmarsh PROJECT NO: PS71204410.02

DATE: 1/26/22 TIME: 1400 CLIMATIC CONDITIONS: sunny cold

OVA/PID READING WHEN WELL OPENED: DEPTH TO PRODUCT (TOC):

STATIC WATER LEVEL (TOC): 11.41 TOTAL DEPTH OF WELL (TOC): 47.88

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE:

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	11.41	1402	0.125	11.6	8.30	0.534	1.21	347	-101.8
	11.74	1406	0.25	11.7	8.29	0.534	1.11	347	-104.7
	11.81	1410	0.375	11.1	8.31	0.536	1.08	348	-101.7
	11.83	1414	0.5	11.1	8.30	0.535	1.10	347	-99.2
	11.86	1418	0.625	11.1	8.31	0.535	1.11	348	-99.8

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland CGinther

SAMPLE NUMBER(S) AND TIME: MWD21-1-012622 1420

NOTES:

LAB ANALYSIS PARAMETERS AND PRESERVATIVES:

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Amber unpreserved - 3-40ml voa vials-HCl 1-500mL unpreserved poly, 1-500ml poly-nitric acid.

DECON. PROCEDURES: New tubing, Alconox, Distilled Water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: CGinther

DATE: 1/28/22 TIME:

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW-21-3 LOCATION: Whitmarsh Landfill PROJECT NO: PS21204410.02

DATE: 1/21/22 TIME: 1456 CLIMATIC CONDITIONS: Cold sunny

OVA/PID READING WHEN WELL OPENED: _____ DEPTH TO PRODUCT (TOC): _____

STATIC WATER LEVEL (TOC): 9.28 TOTAL DEPTH OF WELL (TOC): 18.48

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE: _____

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	9.28	1500	0.125	10.8	6.47	0.757	2.07	489	-111.8
	9.29	1504	0.25	11.6	6.55	0.731	8.34	475	-120.8
	9.29	1508	0.375	11.7	6.59	0.723	3.56	470	-128.3
	9.29	1512	0.5	11.9	6.65	0.709	4.47	460	-134.7
	9.29	1516	0.625	11.9	6.70	0.698	6.32	454	-139.3
	9.29	1520	0.75	11.8	6.69	0.699	8.74	454	-140.8
	9.29	1524	0.875	12.0	6.75	0.690	10.29	449	-144.8
	9.29	1528	1.0	12.0	6.75	0.690	13.85	448	-146.8
	9.29	1532	1.125	11.8	6.78	0.686	15.88	446	-148.9
	9.29	1536	1.25	11.8	6.78	0.686	18.20	446	-149.7
	9.29	1540	1.375	11.8	6.81	0.682	20.33	443	-151.8

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHoward CGinther

SAMPLE NUMBER(S) AND TIME: MW21-3-012622

NOTES: _____

LAB ANALYSIS PARAMETERS AND PRESERVATIVES: _____

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Ambers unpreserved, 3-40mL voa vials-HCL preserved, 1-500mL poly-unpreserved, 1-500mL poly Nitric preserved.

DECON. PROCEDURES: New tubing, Alconox, Distilled water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: CGinther

DATE: 1/28/22 TIME: _____

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW-21-4 LOCATION: Whitmarsh Landfill PROJECT NO: PS212044410.02

DATE: 1/27/22 TIME: 9:29 AM CLIMATIC CONDITIONS: Sunny cold 31°F

OVA/PID READING WHEN WELL OPENED: _____ DEPTH TO PRODUCT (TOC): _____

STATIC WATER LEVEL (TOC): 14.34 TOTAL DEPTH OF WELL (TOC): ~~21.67~~ 21.69 CA

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE: _____

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	14.34	9:31	0.125	12.1	6.63	0.647	3.48	~~5.43~~	-91.6
				~~12.1~~	~~6.64~~			6.2	
	14.32	9:36	0.25	12.1	6.75	0.775	14.17	4.41	-103.9
	14.32	9:41	0.375	12.2	6.82	0.733	~~6.92~~ 24.63	3.7	-120.5
	14.32	9:46	0.5	12.2	6.91	0.705	34.16	3.3	-126.7
	14.32	9:50	0.625	12.4	6.89	0.694	41.34	3.1	-134.3
	14.32	9:55	0.75	12.2	7.09	0.665	51.39	2.9	-144.9
	14.32	9:59	0.875	12.2	7.04	0.663	63.40	2.8	-147.6
	14.32	10:02	1.0	12.4	7.16	0.651	67.52	2.7	-153.9
	14.32	10:05	1.125	12.5	7.19	0.649	69.50	2.6	-155.9
	14.32	10:10	1.35	12.4	7.20	0.646	81.97	2.5	-156.8
	14.32	10:15	1.375	12.6	7.25	0.640	95.29	2.6	-164.6

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland CGinther

SAMPLE NUMBER(S) AND TIME: MW21-4-012722 1015

NOTES: _____

LAB ANALYSIS PARAMETERS AND PRESERVATIVES: _____

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Amber unpreserved 3-40mL voa vials-HCL 1-500mL poly-unpreserved, 1-500mL poly-nitric preserved.

DECON. PROCEDURES: New tubing, Alconox, distilled water

SAMPLES DELIVERED TO: Onsite Environment TRANSPORTER: CGinther

DATE: 1/28/22 TIME: _____

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.87

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW21-5 LOCATION: Whitmarsh PROJECT NO: PS212044410.02

DATE: 1/27/22 TIME: 1050 CLIMATIC CONDITIONS: Sunny, breezy 33°F

OVA/PID READING WHEN WELL OPENED: DEPTH TO PRODUCT (TOC):

STATIC WATER LEVEL (TOC): 9.05 TOTAL DEPTH OF WELL (TOC): 17.30

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE:

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	9.05	~~1054~~	0.125	10.8	6.59	0.291	~~26.092~~	190	3.8
	9.02	1058	0.25	10.8	6.37	0.294	~~138.42~~	191	8.3
	9.04	1102	0.375	11.0	6.35	0.298	96.44	194	~~6.35~~ -1.1
	9.04	1106	0.5	10.9	6.36	0.303	74.36	197	-11.6
	9.06	1110	0.625	10.9	6.33	0.309	65.80	201	-27.9
	9.06	1114	0.75	10.8	6.39	0.312	58.84	203	-35.8
	9.06	1118	0.875	10.8	6.40	0.314	80.32	204	-41.8
	9.05	1122	1.0	10.9	6.41	0.321	21.67	209	-52.9
	9.05	1126	1.25	10.9	6.41	0.322	25.57	209	-55.8
	9.05	1130	1.5	10.9	6.41	0.323	24.80	210	-56.9
	9.05	1134	1.625	10.9	6.42	0.325	27.87	211	-58.8

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland CGinther

SAMPLE NUMBER(S) AND TIME: MW21-5-012722 1137

NOTES:

LAB ANALYSIS PARAMETERS AND PRESERVATIVES:

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L unpreserved Ambers
3 voal vials HCL preserved 1-500mL unpreserved poly.
1-500ml poly-nitric preserved

DECON. PROCEDURES: New tubing, Alconox, distilled water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: CGinther

DATE: 1/27/22 TIME:

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW21-6 LOCATION: Whitmarsh PROJECT NO: PS21204410

DATE: 1/27/22 TIME: 1237 CLIMATIC CONDITIONS: Sunny Cold 48F

OVA/PID READING WHEN WELL OPENED: DEPTH TO PRODUCT (TOC):

STATIC WATER LEVEL (TOC): 8.04 TOTAL DEPTH OF WELL (TOC): 18.89

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE:

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	8.04	1240	0.125	11.3	7.18	0.558	6.22	363	-124.7
	8.03	1244	0.25	11.1	7.10	0.558	9.75	362	-140.9
	8.04	1248	0.375	11.1	7.12	0.556	16.50	362	-149.5
	8.04	1252	0.625	11.1	7.13	0.555	31.07	361	-156.3
	8.04	1256	0.875	11.1	7.14	0.555	39.99	361	-159.2
	8.04	1300	1.0	11.2	7.14	0.554	54.60	360	-162.4
	8.04	1304	1.25	11.2	7.15	0.554	63.12	360	-164.0
	8.04	1308	1.5	11.3	7.15	0.555	61.82	361	-167.6
	8.04	1312	1.75	11.4	7.16	0.554	61.41	360	-169.1

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHowland CGinther

SAMPLE NUMBER(S) AND TIME: MW21-6-012722 1312
Dup

NOTES:

LAB ANALYSIS PARAMETERS AND PRESERVATIVES:

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 12 1L ~~4~~ unpreserved Ambers, 9 Voa vials - HCl, 1 unpreserved 500ml poly, 1 nitric preserved 500ml poly

DECON. PROCEDURES: New tubing, Alconox, distilled water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: CGinther

DATE: 1/28/22 TIME:

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

GRIOUNDWATER SAMPLING LOG

wood.

WELL NO: MW21-7 LOCATION: Whitmarsh PROJECT NO: PS2120441O.02

DATE: 1/27/22 TIME: 1407 CLIMATIC CONDITIONS: Sunny cold 42°F

OVA/PID READING WHEN WELL OPENED: _____ DEPTH TO PRODUCT (TOC): _____

STATIC WATER LEVEL (TOC): 5.83 TOTAL DEPTH OF WELL (TOC): 17.64

METHOD OF REMOVAL: Peristaltic Pump PUMPING RATE: _____

WELL	DTW	Time	Gallons Removed	Temp. (C°)	pH	Sp. Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	REDOX (mv)
PURGE DATA	5.83	1410	0.125	10.1	7.04	0.512	3.20	333	13.9
	5.83	1414	0.25	9.7	6.76	0.513	4.02	333	28.3
	5.83	1418	0.5	9.7	6.67	0.513	2.57	334	35.4
	5.83	1422	0.75	9.6	6.63	0.513	2.83	333	40.2
	5.83	1426	0.875	9.6	6.61	0.512	2.44	333	42.7
	5.83	1430	1.0	9.7	6.59	0.514	2.32	334	46.6
	5.83	1434	1.125	9.8	6.58	0.515	2.22	335	47.2
	5.83	1438	1.25	9.6	6.59	0.511	2.38	332	48.9

SAMPLE WITHDRAWAL METHOD: Peristaltic Pump SAMPLED BY: CHaaland CGinther

SAMPLE NUMBER(S) AND TIME: MW21-7-012722 1438

NOTES: _____

LAB ANALYSIS PARAMETERS AND PRESERVATIVES: _____

NUMBER AND TYPES OF SAMPLE CONTAINERS USED: 4-1L Ambers unpreserved, 3-voavials, HCl preserved 1-500ml unpreserved poly, 1-500ml nitric preserved poly

DECON. PROCEDURES: New tubing, Alconox, distilled water

SAMPLES DELIVERED TO: Onsite Environmental TRANSPORTER: C. Ginther

DATE: 1/28/22 TIME: _____

CAPACITY OF CASING (GALLONS/LINEAR FOOT)
2" - 0.16 • 4" - 0.65 • 6" - 1.47 • 8" - 2.61 • 10" - 4.08 • 12" - 5.57

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-1

Project Name: Whitmarsh Landfill

Project Number: PS21704410.02

Location:

Sampler: CHoagland C Ginther

Date: 10/27/2021

Weather Conditions: cloudy

Wind/Direction: E-W

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 12.01

Wellhead Condition:

Groundwater Elevation (ft):

Depth of Well Casing (ft): 19.98

Actual Purge Volume (gal): 3.8gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
12.01	1101							Water Quality Probe Issues.
12.00	1106							
12.00	1111							
12.00	1116							
12.00	1121							
12.00	1126							
12.00	1131							
12.00	1136							
12.00	1141							
12.00	1146							

Sample ID No.: MW-21-1-102721

Water Level Ind. Model & No.:

ORP/DO Meter Model & No.:

Purge Equipment Used: Bladder pump

Sampling Equipment Used: Bladder pump

Purge Start Time: 1101

Purge Completion Time: 1146

Average Purge Rate (mL/min):

Analytical Lab: Onsite

Sample Collection Time: 1146

Purging Method:

Sample Containers Used:

Chemical Analyses:

Other Field Observations: Well volume calculated - 3 well volumes removed 3.8 gallons.

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-2

Project Name: Whitmarsh Landfill
Date: 10/28/21
Project Number: PS21204410.02
Weather Conditions: Rainy
Location:
Sampler: CHaaland CGinther
Wind/Direction: E→W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 10.91
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 18.67
Actual Purge Volume (gal): 3.75gal.

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
10.90	833	[illegible]	0.870	12.36	24	14.30	249	
10.90	838	4.92	0.860	13.17	5	7.37	184	
10.90	843	4.98	0.852	13.24	9	6.75	114	
10.90	847	5.17	0.856	13.16	4	3.24	88.7	
10.90	852	5.34	0.860	13.10	-4	1.71	62.9	
10.90	856	5.44	0.861	13.19	-8	2.94	51.7	
10.90	900	5.87	0.861	13.11	-12	6.87	47.8	
10.90	903	6.06	0.860	13.05	-16	8.37	43.5	
10.90	908	5.86	0.869	13.15	-28	1.76	39.5	
10.90	911	5.92	0.867	13.15	-32	1.76	36.3	
10.90	915	6.06	0.869	13.14	-37	1.77	30.9	

Sample ID No.: MW-21-2-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used: Bladderpump
Sampling Equipment Used: Bladder pump
Purge Start Time: 830
Purge Completion Time: 915
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 915
Purging Method:
Sample Containers Used:
Chemical Analyses:

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MWD-21-1

Project Name: Whitmarsh
Date: 10/28/21
Project Number: PS212044D.02
Weather Conditions: Rainy
Location:
Sampler: CHouland CGinther
Wind/Direction: E→W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 11.86
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 47.88
Actual Purge Volume (gal): 3.75gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
11.85	1015	4.31	0.559	13.02	-102	17.85	141	
11.85	1020	6.83	0.551	13.07	-100	10.30	141	
11.85	1025	9.06	0.546	13.12	-100	5.63	142	
11.85	1030	9.16	0.543	12.93	-102	5.56	149	
11.85	1035	9.16	0.545	12.87	-100	5.41	149	
11.85	1040	9.17	0.543	12.82	-96	5.02	148	
11.85	1045	9.17	0.544	12.85	-89	6.15	145	
11.85	1050	8.90	0.546	12.78	-82	6.51	147	
11.85	1055	8.81	0.552	~~13~~ 13.11	-80	6.82	139	

Sample ID No.: MWD-21-1-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used: Bladder pump
Sampling Equipment Used: Bladder pump

Purge Start Time: 1010
Purge Completion Time: 1055
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 1055
Purging Method:
Sample Containers Used:
Chemical Analyses:

Other Field Observations:

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-3

Project Name: ~~BS~~ Whitmarsh Landfill

Date: 10/28/21

Project Number: PS212044 10.02

Weather Conditions: Rainy

Location:

Sampler: CHowland CGaither

Wind/Direction: E→W

WELL INFORMATION

Casing Diameter (in): 2"

Top of Casing Elevation (ft):

Initial Depth to Water (ft): 9.56

Wellhead Condition:

Groundwater Elevation (ft):

Depth of Well Casing (ft): 18.48

Actual Purge Volume (gal): 4.3

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.55	1144	3.21	0.661	13.14	104	15.62	147	Water Quality Probe is having issues.
9.55	1148	3.37	0.698	13.12	106	15.99	136	
9.55	1157	6.02	0.538	13.19	-20	~~13.30~~ 7.02	94.9	
9.55	1206	3.72	0.666	13.80	73		52.5	
9.55	1215	4.93	~~0.660~~ 0.661	13.72	15	4.24	~~525~~ 39.5	
9.55	1220		Water Quality probe Failure					
9.55	1225							

Sample ID No.: MW-21-3-102821

Water Level Ind. Model & No.:

ORP/DO Meter Model & No.:

Purge Equipment Used: Bladder Pump

Sampling Equipment Used: Bladder Pump

Purge Start Time: 1140

Purge Completion Time: 1225

Average Purge Rate (mL/min):

Analytical Lab: Onsite

Sample Collection Time: 1228

Purging Method:

Sample Containers Used:

Chemical Analyses:

Other Field Observations: Well volume calculated 3 well volumes = 4.3g
Water Sample collected after 3 well volumes removed

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-4

Project Name: Whitmarsh Landfill
Date: 10/28/21
Project Number: PS21204410.02
Weather Conditions: Rainy
Location:
Sampler: CHovland CGinther
Wind/Direction: E-7W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 14.59
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 21.69
Actual Purge Volume (gal): 3.5gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
14.59	1310							WaterQuality Probe TS malfunctioning
14.59	1315							
14.59	1320							Well volumes calculated WL observed
14.59	1325							
14.59	1330							
14.59	1335							
14.59	1340							
14.59	1345							
14.59	1350							
14.59	1355							

Sample ID No.: MW-21-4-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used: Bladder pump
Sampling Equipment Used: Bladder pump

Purge Start Time: 1310
Purge Completion Time: 1355
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 1358
Purging Method:
Sample Containers Used:
Chemical Analyses:

Other Field Observations: ~~It~~ 3x well volume = ~~3~~ 3.4 gallons

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-5

Project Name: Whitmarsh Landfill
Date: 10/28/21
Project Number: PS2120440.02
Weather Conditions: Rainy
Location:
Sampler: CHasland CGinther
Wind/Direction: E-W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 9.47
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 17.30
Actual Purge Volume (gal): 3.75 gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
9.47	1440							Water Quality Meter IS Malfunctioning
9.46	1445							
9.46	1450							
9.46	1455							
9.46	1500							
9.46	1505							

Sample ID No.: MW-21-5-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used: Bladderpump
Sampling Equipment Used: Bladder Pump

Purge Start Time: 1440
Purge Completion Time: 1505
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 1505
Purging Method:
Sample Containers Used:
Chemical Analyses:

Other Field Observations: 3x well volume calculation = 3.75 gallons

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-6

Project Name: Whitmarsh Landfill
Date: 10/28/21
Project Number: PS21204410.02
Weather Conditions: Rainy
Location:
Sampler: CHasland CGinther **Wind/Direction:** E-W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 8.56
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 18.89
Actual Purge Volume (gal): 5gal

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
8.56	1545	Water Quality Meter TS Malfunctioning						
8.55	1550							
8.55	1550							
8.55	1555							
8.55	1600							
8.55	1605							
8.55	1610							
8.55	1615							
8.55	1620							

Sample ID No.: MW-21-6-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used: Bladder pump
Sampling Equipment Used: Bladder pump
Purge Start Time: 1545
Purge Completion Time: 1620
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 1620
Purging Method:
Sample Containers Used:
Chemical Analyses:
Other Field Observations: 3x well volume = 4.95 gallons

wood.

GROUNDWATER SAMPLING LOG
Low Flow Sampling

MONITORING WELL/PIEZOMETER NUMBER MW-21-7

Project Name: Whitmarsh Landfill
Date: 10/28/21
Project Number: PS2120440.02
Weather Conditions: Rainy
Location:
Sampler: CHaviland CGinther
Wind/Direction: E→W

WELL INFORMATION

Casing Diameter (in): 2"
Top of Casing Elevation (ft):
Initial Depth to Water (ft): 5.41
Wellhead Condition:
Groundwater Elevation (ft):
Depth of Well Casing (ft): 17.64
Actual Purge Volume (gal): 6gallons

PURGING MEASUREMENTS

WL (ft btoc)	Time	pH (std. units)	SC (ms/cm)	Temp. (°C)	ORP (mv)	DO (mg/L)	Turbidity (NTUs)	Notes
5.41	1655		Water Quality Meter is Malfunctioning					
5.42	1700							
5.42	1705							
5.42	1710							
5.42	1715							
5.42	1720							
5.42	1725							
5.42	1730							

Sample ID No.: MW-21-7-102821
Water Level Ind. Model & No.:
ORP/DO Meter Model & No.:
Purge Equipment Used:
Sampling Equipment Used:

Purge Start Time: 1655
Purge Completion Time: 1730
Average Purge Rate (mL/min):
Analytical Lab: Onsite
Sample Collection Time: 1730
Purging Method:
Sample Containers Used:
Chemical Analyses:

Other Field Observations: 3x well volume = 5.87gallons

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 30, 2021

Koorus Tahghighi
Wood Environment and Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA 98101

Re: Analytical Data for Project PS2120440
Laboratory Reference No. 2109-259

Dear Koorus:

Enclosed are the analytical results and associated quality control data for samples submitted on September 23, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 29 2021
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
TP-21-2-0921	Soil	21-A017675	Sieve Analysis, CONV
TP-21-4-0921	Soil	21-A017676	Sieve Analysis, CONV
TP-21-6-0921	Soil	21-A017677	Sieve Analysis, CONV
TP-21-8-0921	Soil	21-A017678	Sieve Analysis, CONV
TP-21-10-0921	Soil	21-A017679	Sieve Analysis, CONV
TP-21-12-0921	Soil	21-A017680	Sieve Analysis, CONV

Your samples were received on Friday, November 19, 2021. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,

Aaron W. Young
Vice President

Project #: PS2120440
SDG #: 2121920
PO Number: 09-259

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
SDG Number: 2121920
Project #: PS2120440
PO Number: 09-259
All results reported on a dry weight basis.

Date Received: 11/19/21
Date Reported: 11/29/21

AMTEST Identification Number **21-A017675**
Client Identification **TP-21-2-0921**
Sampling Date **09/21/21, 08:45**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	94.5	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	13.8	% Retained	ASTM D422	SF	11/24/21
#8	2.36 mm	4.20	% Retained	ASTM D422	SF	11/24/21
#16	1.18 mm	4.10	% Retained	ASTM D422	SF	11/24/21
#30	0.60 mm	7.70	% Retained	ASTM D422	SF	11/24/21
#60	0.25 mm	35.2	% Retained	ASTM D422	SF	11/24/21
#100	0.15 mm	6.60	% Retained	ASTM D422	SF	11/24/21
#200	0.075 mm	5.60	% Retained	ASTM D422	SF	11/24/21

AMTEST Identification Number **21-A017676**
Client Identification **TP-21-4-0921**
Sampling Date **09/21/21, 09:05**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	93.4	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	23.4	% Retained	ASTM D422	SF	11/24/21
#8	2.36 mm	3.40	% Retained	ASTM D422	SF	11/24/21
#16	1.18 mm	4.70	% Retained	ASTM D422	SF	11/24/21
#30	0.60 mm	8.60	% Retained	ASTM D422	SF	11/24/21
#60	0.25 mm	30.3	% Retained	ASTM D422	SF	11/24/21
#100	0.15 mm	7.30	% Retained	ASTM D422	SF	11/24/21
#200	0.075 mm	4.30	% Retained	ASTM D422	SF	11/24/21

AMTEST Identification Number **21-A017677**
Client Identification **TP-21-6-0921**
Sampling Date **09/21/21, 09:25**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	65.4	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	9.90	% Retained	ASTM D422	SF	11/24/21
#8	2.36 mm	4.40	% Retained	ASTM D422	SF	11/24/21
#16	1.18 mm	5.80	% Retained	ASTM D422	SF	11/24/21
#30	0.60 mm	4.00	% Retained	ASTM D422	SF	11/24/21
#60	0.25 mm	7.40	% Retained	ASTM D422	SF	11/24/21
#100	0.15 mm	3.10	% Retained	ASTM D422	SF	11/24/21
#200	0.075 mm	22.7	% Retained	ASTM D422	SF	11/24/21

AMTEST Identification Number **21-A017678**
Client Identification **TP-21-8-0921**
Sampling Date **09/21/21, 09:50**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	92.0	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	63.9	% Retained	ASTM D422	SF	11/24/21
#8	2.36 mm	4.40	% Retained	ASTM D422	SF	11/24/21
#16	1.18 mm	2.60	% Retained	ASTM D422	SF	11/24/21
#30	0.60 mm	5.60	% Retained	ASTM D422	SF	11/24/21
#60	0.25 mm	12.1	% Retained	ASTM D422	SF	11/24/21
#100	0.15 mm	3.10	% Retained	ASTM D422	SF	11/24/21
#200	0.075 mm	3.40	% Retained	ASTM D422	SF	11/24/21

AMTEST Identification Number **21-A017679**
Client Identification **TP-21-10-0921**
Sampling Date **09/21/21, 10:10**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	90.0	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	2.90	% Retained	ASTM D422	SF	11/29/21
#8	2.36 mm	1.80	% Retained	ASTM D422	SF	11/29/21
#16	1.18 mm	3.20	% Retained	ASTM D422	SF	11/29/21
#30	0.60 mm	6.10	% Retained	ASTM D422	SF	11/29/21
#60	0.25 mm	22.3	% Retained	ASTM D422	SF	11/29/21
#100	0.15 mm	11.7	% Retained	ASTM D422	SF	11/29/21
#200	0.075 mm	8.40	% Retained	ASTM D422	SF	11/29/21

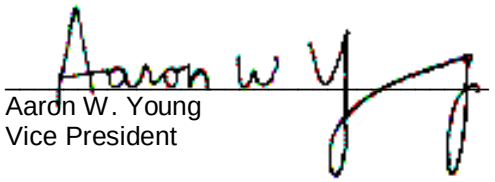
AMTEST Identification Number **21-A017680**
Client Identification **TP-21-12-0921**
Sampling Date **09/21/21, 10:30**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Solids	91.6	%		0.1	SM 2540G	SF	11/22/21

Particle Size by Sieve Only

Sieve Number	Sieve Size	RESULT	UNITS	METHOD	ANALYST	DATE
#4	4.75 mm	20.7	% Retained	ASTM D422	SF	11/29/21
#8	2.36 mm	4.20	% Retained	ASTM D422	SF	11/29/21
#16	1.18 mm	3.40	% Retained	ASTM D422	SF	11/29/21
#30	0.60 mm	8.70	% Retained	ASTM D422	SF	11/29/21
#60	0.25 mm	28.0	% Retained	ASTM D422	SF	11/29/21
#100	0.15 mm	8.00	% Retained	ASTM D422	SF	11/29/21
#200	0.075 mm	7.60	% Retained	ASTM D422	SF	11/29/21



Aaron W. Young
Vice President

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 09-259

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: PS2120440

Project Name:

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
	TP-21-2-0921 17675	9/21/21	8:45	S	1	Moisture Content, Grainsize ASTM D422*
	TP-21-4-0921 76	9/21/21	9:05	S	1	Moisture Content, Grainsize ASTM D422*
	TP-21-6-0921 77	9/21/21	9:25	S	1	Moisture Content, Grainsize ASTM D422*
	TP-21-8-0921 78	9/21/21	9:50	S	1	Moisture Content, Grainsize ASTM D422*
	TP-21-10-0921 79	9/21/21	10:10	S	1	Moisture Content, Grainsize ASTM D422*
	TP-21-12-0921 80	9/21/21	10:30	S	1	Moisture Content, Grainsize ASTM D422*

	Company	Date	Time	Comments/Special Instructions
Relinquished by:	Onsite Environmental	11/18/21	4:00	
Received by:	AMTEST T=16.0	11/18/21	4:00	*Sieve Sizes: 4, 8, 16, 30, 60, 100, 200
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

Chain of Custody

Page 1 of 2

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 09-259

Company: Wood PLC
Project Number: PS2120440
Project Name: March Point (Whitmarsh) Landfill
Project Manager: Koorus Tahghighi
Sampled by: Cheyenne Ginther

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
~~☒ Standard (7 Days)~~
☒ Hold
(other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	~~TCLP Metals~~ MOISTURE CONTENT	HEM (oil and grease) 1664A	GRAIN SIZE ASTM D422	*Sieve sizes: 4, 8, 16, 30, 60, 100, 200
1	TP-21-1-0921	9/21/21	830	N/A	1																X		X	
2	TP-21-2-0921	9/21/21	845		1																X		X	
3	TP-21-3-0921		855		1																			
4	TP-21-4-0921		905		1																X		X	
5	TP-21-5-0921		915		1																			
6	TP-21-6-0921		925		1																X		X	
7	TP-21-7-0921		935		1																			
8	TP-21-8-0921		950		1																X		X	
9	TP-21-9-0921		1000		1																			
10	TP-21-10-0921		1010		1																X		X	

	Signature	Company	Date	Time
Relinquished	Cheyenne Ginther	Wood PLC	9/23/21	1330
Received	[signature]	OSE	9/23/21	1338
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
~~Please hold~~
samples & contact
koorus.tahghighi1@woodplc.com
for further details.
☒ Added 11/17/21. DB (STA)

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDD) ☐

Chain of Custody

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Wood PLC
Project Number: PS2120440
Project Name: March Point (Whitmarsh) Landfill
Project Manager: Koorus Taghighi
Sampled by: Cheyenne Gintner

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ ~~Standard (7 Days)~~
☒ Hold (other)

Laboratory Number: 09-259

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260C	Halogenated Volatiles 8260C	EDB EPA 8011 (Waters Only)	Semivolatiles 8270D/SIM (with low-level PAHs)	PAHs 8270D/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270D/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total MTCA Metals	~~TCLP Metals~~ Moisture Content	HEM (oil and grease) 1664A	GI2A, NSITE ASTM D422
11	TP-21-11-0921	9/21/21	1020		1																		
12	TP-21-12-0921	9/21/21	1030		1																X		X

	Signature	Company	Date	Time
Relinquished	Cheyenne Gintner	Wood PLC	9/23/21	1338
Received		OSE	9/23/21	1338
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (ED

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 18, 2021

Koorus Tahghighi
Wood Environment and Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA 98101

Re: Analytical Data for Project Whitmarsh Landfill
Laboratory Reference No. 2110-289

Dear Koorus:

Enclosed are the analytical results and associated quality control data for samples submitted on October 29, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

Case Narrative

Samples were collected on October 27 and 28, 2021 and received by the laboratory on October 29, 2021. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Lead EPA 6010D Analysis

Sample MW-21-1-102721 (10-289-01) was the quality control sample instead of sample MW-21-1-102821 (10-289-08) because of insufficient sample remaining for digestion.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**0.10**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.27**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*34*	*10 - 82*				
Phenol-d6	*27*	*10 - 92*				
Nitrobenzene-d5	*53*	*32 - 105*				
2-Fluorobiphenyl	*65*	*38 - 105*				
2,4,6-Tribromophenol	*86*	*25 - 124*				
Terphenyl-d14	*73*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
n-Nitrosodimethylamine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**3.5**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**0.33**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**5.6**	0.98	EPA 8270E	11-2-21	11-3-21	
1-Methylnaphthalene	**10**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorocyclopentadiene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**2.1**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Nitrophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Fluorene	**1.5**	0.98	EPA 8270E	11-2-21	11-3-21	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.8	EPA 8270E	11-2-21	11-3-21	U1
1,2-Diphenylhydrazine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**1.4**	0.98	EPA 8270E	11-2-21	11-3-21	
Anthracene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.011**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*31*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*71*	*38 - 105*				
2,4,6-Tribromophenol	*92*	*25 - 124*				
Terphenyl-d14	*81*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.11**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.013**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.015**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.015**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.014**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*29*	*10 - 92*				
Nitrobenzene-d5	*60*	*32 - 105*				
2-Fluorobiphenyl	*64*	*38 - 105*				
2,4,6-Tribromophenol	*86*	*25 - 124*				
Terphenyl-d14	*60*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**1.5**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.15**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*40*	*10 - 82*				
Phenol-d6	*30*	*10 - 92*				
Nitrobenzene-d5	*63*	*32 - 105*				
2-Fluorobiphenyl	*68*	*38 - 105*				
2,4,6-Tribromophenol	*89*	*25 - 124*				
Terphenyl-d14	*73*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.14**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*37*	*10 - 82*				
Phenol-d6	*29*	*10 - 92*				
Nitrobenzene-d5	*64*	*32 - 105*				
2-Fluorobiphenyl	*67*	*38 - 105*				
2,4,6-Tribromophenol	*88*	*25 - 124*				
Terphenyl-d14	*74*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**7.2**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**11**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**130**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**1.4**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**2.6**	1.0	EPA 8270E	11-2-21	11-3-21	
1-Methylnaphthalene	**3.4**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**1.4**	1.0	EPA 8270E	11-2-21	11-3-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.21	EPA 8270E/SIM	11-2-21	11-2-21	U1
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.31**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**0.25**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.031**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.16**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.034**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.028**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**0.014**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**0.016**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*31*	*10 - 82*				
Phenol-d6	*25*	*10 - 92*				
Nitrobenzene-d5	*60*	*32 - 105*				
2-Fluorobiphenyl	*60*	*38 - 105*				
2,4,6-Tribromophenol	*84*	*25 - 124*				
Terphenyl-d14	*78*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**7.8**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**1300**	100	EPA 8270E	11-2-21	11-4-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**1700**	100	EPA 8270E	11-2-21	11-4-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	13	EPA 8270E	11-2-21	11-4-21	
Isophorone	**ND**	13	EPA 8270E	11-2-21	11-4-21	
2-Nitrophenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2,4-Dimethylphenol	**3100**	200	EPA 8270E	11-2-21	11-4-21	
bis(2-Chloroethoxy)methane	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2,4-Dichlorophenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
1,2,4-Trichlorobenzene	**ND**	10	EPA 8270E	11-2-21	11-4-21	
Naphthalene	**19**	10	EPA 8270E	11-2-21	11-4-21	
4-Chloroaniline	**ND**	10	EPA 8270E	11-2-21	11-4-21	
Hexachlorobutadiene	**ND**	10	EPA 8270E	11-2-21	11-4-21	
4-Chloro-3-methylphenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2-Methylnaphthalene	**16**	10	EPA 8270E	11-2-21	11-4-21	
1-Methylnaphthalene	**14**	10	EPA 8270E	11-2-21	11-4-21	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**2.4**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
2,4-Dinitrophenol	**ND**	8.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**1.0**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**2.0**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**5.7**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**1.6**	1.0	EPA 8270E	11-2-21	11-3-21	
4,6-Dinitro-2-methylphenol	**ND**	7.3	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**80**	50	EPA 8270E	11-2-21	11-4-21	
Phenanthrene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Anthracene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Carbazole	**2.0**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.62	EPA 8270E/SIM	11-2-21	11-3-21	U1
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.057**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Chrysene	**0.057**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo(j,k)fluoranthene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo[a]pyrene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Dibenz[a,h]anthracene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo[g,h,i]perylene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*41*	*10 - 82*				
Phenol-d6	*13*	*10 - 92*				
Nitrobenzene-d5	*63*	*32 - 105*				
2-Fluorobiphenyl	*65*	*38 - 105*				
2,4,6-Tribromophenol	*82*	*25 - 124*				
Terphenyl-d14	*74*	*42 - 116*				

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
n-Nitrosodimethylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
2,4-Dinitrophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*34*	*10 - 82*				
Phenol-d6	*25*	*10 - 92*				
Nitrobenzene-d5	*57*	*32 - 105*				
2-Fluorobiphenyl	*60*	*38 - 105*				
2,4,6-Tribromophenol	*76*	*25 - 124*				
Terphenyl-d14	*64*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
2,4-Dinitrophenol	**ND**	8.1	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	7.4	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.021**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.016**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.012**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*43*	*10 - 82*				
Phenol-d6	*32*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*68*	*38 - 105*				
2,4,6-Tribromophenol	*60*	*25 - 124*				
Terphenyl-d14	*70*	*42 - 116*				

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*26*	*10 - 82*				
Phenol-d6	*22*	*10 - 92*				
Nitrobenzene-d5	*40*	*32 - 105*				
2-Fluorobiphenyl	*55*	*38 - 105*				
2,4,6-Tribromophenol	*80*	*25 - 124*				
Terphenyl-d14	*72*	*42 - 116*				

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Phenol	**12.9**	**14.2**	38.6	38.4	ND	33	37	20 - 108	10	24	
2-Chlorophenol	**27.7**	**29.6**	38.6	38.4	ND	72	77	24 - 105	7	32	
1,4-Dichlorobenzene	**12.1**	**12.6**	19.3	19.2	ND	63	66	24 - 100	4	36	
n-Nitroso-di-n-propylamine	**14.9**	**16.0**	19.3	19.2	ND	77	83	21 - 143	7	30	
1,2,4-Trichlorobenzene	**13.1**	**14.4**	19.3	19.2	ND	68	75	34 - 105	9	34	
4-Chloro-3-methylphenol	**30.0**	**32.1**	38.6	38.4	ND	78	84	44 - 113	7	21	
Acenaphthene	**14.6**	**15.5**	19.3	19.2	ND	76	81	47 - 106	6	19	
4-Nitrophenol	**20.7**	**22.8**	38.6	38.4	ND	54	59	20 - 127	10	37	
2,4-Dinitrotoluene	**15.6**	**16.5**	19.3	19.2	ND	81	86	45 - 106	6	19	
Pentachlorophenol	**39.4**	**44.8**	38.6	38.4	ND	102	117	20 - 136	13	39	
Pyrene	**15.6**	**16.2**	19.3	19.2	ND	81	84	47 - 112	4	23	
Surrogate:											
2-Fluorophenol						*37*	*40*	*10 - 82*			
Phenol-d6						*27*	*30*	*10 - 92*			
Nitrobenzene-d5						*60*	*66*	*32 - 105*			
2-Fluorobiphenyl						*63*	*67*	*38 - 105*			
2,4,6-Tribromophenol						*77*	*85*	*25 - 124*			
Terphenyl-d14						*65*	*67*	*42 - 116*			

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB1102W1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**16.1**	**16.3**	40.0	40.0	40	41	21 - 53	1	26	
2-Chlorophenol	**30.8**	**31.3**	40.0	40.0	77	78	38 - 92	2	28	
1,4-Dichlorobenzene	**14.3**	**14.0**	20.0	20.0	72	70	30 - 88	2	32	
n-Nitroso-di-n-propylamine	**16.3**	**16.2**	20.0	20.0	82	81	40 - 103	1	27	
1,2,4-Trichlorobenzene	**15.4**	**15.0**	20.0	20.0	77	75	37 - 95	3	29	
4-Chloro-3-methylphenol	**34.9**	**34.9**	40.0	40.0	87	87	50 - 101	0	17	
Acenaphthene	**16.4**	**17.0**	20.0	20.0	82	85	46 - 97	4	19	
4-Nitrophenol	**26.3**	**25.8**	40.0	40.0	66	65	23 - 64	2	34	I,I
2,4-Dinitrotoluene	**18.2**	**18.1**	20.0	20.0	91	91	46 - 100	1	17	
Pentachlorophenol	**45.6**	**46.3**	40.0	40.0	114	116	39 - 123	2	29	
Pyrene	**18.1**	**18.0**	20.0	20.0	91	90	52 - 107	1	19	
Surrogate:										
2-Fluorophenol					*46*	*45*	*10 - 82*			
Phenol-d6					*33*	*33*	*10 - 92*			
Nitrobenzene-d5					*65*	*66*	*32 - 105*			
2-Fluorobiphenyl					*67*	*68*	*38 - 105*			
2,4,6-Tribromophenol					*85*	*87*	*25 - 124*			
Terphenyl-d14					*72*	*72*	*42 - 116*			

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*98*	*42-140*				
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1242	**0.057**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*86*	*42-140*				
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Aroclor 1016	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*104*	*42-140*				
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Aroclor 1016	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	5.0	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*104*	*42-140*				
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Aroclor 1016	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	4.8	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.048	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Aroclor 1016	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	5.0	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*99*	*42-140*				
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Aroclor 1016	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*103*	*42-140*				
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Aroclor 1016	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*93*	*42-140*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*98*	*42-140*				
Laboratory ID:	MB1103W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*99*	*42-140*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Aroclor 1260	**0.427**	**0.432**	0.493	0.483	ND	**87**	**89**	80-119	1	17	
Surrogate:											
DCB						*104*	*108*	*42-140*			
SPIKE BLANKS											
Laboratory ID:	SB1101W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.402**	**0.385**	0.500	0.500	N/A	**80**	**77**	73-131	4	12	
Surrogate:											
DCB						*95*	*94*	*42-140*			
Laboratory ID:	SB1103W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.489**	**0.486**	0.500	0.500	N/A	**98**	**97**	73-131	1	12	
Surrogate:											
DCB						*112*	*108*	*42-140*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.0099	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*47*	*25-114*				
DCB	*68*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-3-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-3-21	
gamma-Chlordane	**0.011**	0.0050	EPA 8081B	11-3-21	11-3-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Methoxychlor	**ND**	0.0099	EPA 8081B	11-3-21	11-3-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-3-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*47*	*25-114*				
DCB	*62*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-8-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-8-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-3-21	11-8-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-8-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*60*	*25-114*				
DCB	*59*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
alpha-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0031	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.051	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*54*	*25-114*				
DCB	*75*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**0.33**	0.020	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**0.23**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endosulfan I	**0.052**	0.0050	EPA 8081B	11-1-21	11-2-21	P
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**0.048**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**0.010**	0.0050	EPA 8081B	11-1-21	11-2-21	P
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**0.014**	0.010	EPA 8081B	11-1-21	11-2-21	P
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*52*	*25-114*				
DCB	*75*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
alpha-BHC	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
gamma-BHC (Lindane)	**0.056**	0.048	EPA 8081B	11-1-21	11-8-21	
beta-BHC	**0.058**	0.048	EPA 8081B	11-1-21	11-8-21	
delta-BHC	**0.067**	0.048	EPA 8081B	11-1-21	11-8-21	
Heptachlor	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Aldrin	**0.22**	0.019	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**0.14**	0.029	EPA 8081B	11-1-21	11-8-21	P
gamma-Chlordane	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
alpha-Chlordane	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDE	**0.70**	0.048	EPA 8081B	11-1-21	11-8-21	
Endosulfan I	**0.21**	0.048	EPA 8081B	11-1-21	11-8-21	P
Dieldrin	**0.086**	0.048	EPA 8081B	11-1-21	11-8-21	P
Endrin	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDD	**0.59**	0.048	EPA 8081B	11-1-21	11-8-21	
Endosulfan II	**0.83**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDT	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Endrin Aldehyde	**0.19**	0.048	EPA 8081B	11-1-21	11-8-21	P
Methoxychlor	**ND**	0.097	EPA 8081B	11-1-21	11-8-21	
Endosulfan Sulfate	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Endrin Ketone	**ND**	0.19	EPA 8081B	11-1-21	11-8-21	
Toxaphene	**ND**	0.48	EPA 8081B	11-1-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
alpha-BHC	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
gamma-BHC (Lindane)	**0.069**	0.050	EPA 8081B	11-1-21	11-8-21	P
beta-BHC	**0.10**	0.050	EPA 8081B	11-1-21	11-8-21	P
delta-BHC	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Heptachlor	**0.054**	0.050	EPA 8081B	11-1-21	11-8-21	P
Aldrin	**3.2**	0.020	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**0.37**	0.030	EPA 8081B	11-1-21	11-8-21	P
gamma-Chlordane	**1.1**	0.050	EPA 8081B	11-1-21	11-8-21	P
alpha-Chlordane	**0.28**	0.050	EPA 8081B	11-1-21	11-8-21	P
4,4'-DDE	**0.32**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endosulfan I	**0.44**	0.050	EPA 8081B	11-1-21	11-8-21	P
Dieldrin	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endrin	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
4,4'-DDD	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endosulfan II	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
4,4'-DDT	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endrin Aldehyde	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Methoxychlor	**ND**	0.10	EPA 8081B	11-1-21	11-8-21	
Endosulfan Sulfate	**0.060**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endrin Ketone	**ND**	0.20	EPA 8081B	11-1-21	11-8-21	
Toxaphene	**ND**	0.50	EPA 8081B	11-1-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
alpha-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Aldrin	**0.0022**	0.0021	EPA 8081B	11-1-21	11-2-21	P
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.011	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.021	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.053	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*50*	*25-114*				
DCB	*75*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
alpha-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.051	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*46*	*25-114*				
DCB	*83*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*45*	*25-114*				
DCB	*86*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1103W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-3-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-3-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-3-21	11-3-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-3-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*60*	*25-114*				
DCB	*91*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
alpha-BHC	**0.0694**	**0.0695**	0.102	0.102	ND	**68**	**68**	50-130	0	15	
gamma-BHC (Lindane)	**0.0712**	**0.0711**	0.102	0.102	ND	**70**	**70**	50-130	0	15	
beta-BHC	**0.0646**	**0.0633**	0.102	0.102	ND	**63**	**62**	50-130	2	15	
delta-BHC	**0.0780**	**0.0753**	0.102	0.102	ND	**76**	**74**	50-130	4	15	
Heptachlor	**0.0747**	**0.0769**	0.102	0.102	ND	**73**	**76**	50-130	3	15	
Aldrin	**0.0631**	**0.0659**	0.102	0.102	0.00217	**59**	**63**	50-130	4	15	
Heptachlor Epoxide	**0.0732**	**0.0717**	0.102	0.102	ND	**71**	**71**	50-130	2	15	
gamma-Chlordane	**0.0629**	**0.0621**	0.102	0.102	ND	**61**	**61**	50-130	1	15	
alpha-Chlordane	**0.0632**	**0.0616**	0.102	0.102	ND	**62**	**61**	50-130	3	15	
4,4'-DDE	**0.0737**	**0.0712**	0.102	0.102	ND	**72**	**70**	50-130	3	15	
Endosulfan I	**0.0730**	**0.0716**	0.102	0.102	ND	**71**	**71**	50-130	2	15	
Dieldrin	**0.0756**	**0.0722**	0.102	0.102	ND	**74**	**71**	50-130	5	15	
Endrin	**0.0824**	**0.0815**	0.102	0.102	ND	**80**	**80**	50-130	1	15	
4,4'-DDD	**0.0870**	**0.0794**	0.102	0.102	ND	**85**	**78**	50-130	9	15	
Endosulfan II	**0.0718**	**0.0679**	0.102	0.102	ND	**70**	**67**	50-130	6	15	
4,4'-DDT	**0.0886**	**0.0819**	0.102	0.102	ND	**86**	**81**	50-130	8	15	
Endrin Aldehyde	**0.0683**	**0.0649**	0.102	0.102	ND	**67**	**64**	50-130	5	15	
Methoxychlor	**0.0775**	**0.0734**	0.102	0.102	ND	**76**	**72**	50-130	5	15	
Endosulfan Sulfate	**0.0710**	**0.0683**	0.102	0.102	ND	**69**	**67**	50-130	4	15	
Endrin Ketone	**0.0789**	**0.0753**	0.102	0.102	ND	**77**	**74**	50-130	5	15	
Surrogate:											
TCMX						*48*	*54*	*25-114*			
DCB						*80*	*77*	*30-137*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	Flags
SPIKE BLANK						
Laboratory ID:	SB1101W2					
alpha-BHC	**0.0723**	0.100	N/A	**72**	42-113	
gamma-BHC (Lindane)	**0.0726**	0.100	N/A	**73**	45-114	
beta-BHC	**0.0703**	0.100	N/A	**70**	40-118	
delta-BHC	**0.0746**	0.100	N/A	**75**	20-125	
Heptachlor	**0.0727**	0.100	N/A	**73**	41-120	
Aldrin	**0.0671**	0.100	N/A	**67**	35-115	
Heptachlor Epoxide	**0.0717**	0.100	N/A	**72**	50-118	
gamma-Chlordane	**0.0647**	0.100	N/A	**65**	46-110	
alpha-Chlordane	**0.0646**	0.100	N/A	**65**	38-112	
4,4'-DDE	**0.0810**	0.100	N/A	**81**	41-127	
Endosulfan I	**0.0716**	0.100	N/A	**72**	45-119	
Dieldrin	**0.0752**	0.100	N/A	**75**	46-115	
Endrin	**0.0802**	0.100	N/A	**80**	52-124	
4,4'-DDD	**0.0828**	0.100	N/A	**83**	52-121	
Endosulfan II	**0.0685**	0.100	N/A	**69**	44-114	
4,4'-DDT	**0.0902**	0.100	N/A	**90**	48-123	
Endrin Aldehyde	**0.0642**	0.100	N/A	**64**	45-114	
Methoxychlor	**0.113**	0.100	N/A	**113**	49-130	
Endosulfan Sulfate	**0.0692**	0.100	N/A	**69**	39-117	
Endrin Ketone	**0.0724**	0.100	N/A	**72**	53-119	
Surrogate:						
TCMX				*60*	*25-114*	
DCB				*86*	*30-137*	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB1103W2										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0736**	**0.0697**	0.100	0.100	N/A	**74**	**70**	42-113	5	19	
gamma-BHC (Lindane)	**0.0738**	**0.0701**	0.100	0.100	N/A	**74**	**70**	45-114	5	15	
beta-BHC	**0.0725**	**0.0683**	0.100	0.100	N/A	**73**	**68**	40-118	6	15	
delta-BHC	**0.0729**	**0.0710**	0.100	0.100	N/A	**73**	**71**	20-125	3	15	
Heptachlor	**0.0759**	**0.0719**	0.100	0.100	N/A	**76**	**72**	41-120	5	16	
Aldrin	**0.0707**	**0.0656**	0.100	0.100	N/A	**71**	**66**	35-115	7	15	
Heptachlor Epoxide	**0.0725**	**0.0687**	0.100	0.100	N/A	**73**	**69**	50-118	5	15	
gamma-Chlordane	**0.0666**	**0.0632**	0.100	0.100	N/A	**67**	**63**	46-110	5	15	
alpha-Chlordane	**0.0666**	**0.0628**	0.100	0.100	N/A	**67**	**63**	38-112	6	15	
4,4'-DDE	**0.0831**	**0.0787**	0.100	0.100	N/A	**83**	**79**	41-127	5	15	
Endosulfan I	**0.0737**	**0.0695**	0.100	0.100	N/A	**74**	**70**	45-119	6	15	
Dieldrin	**0.0777**	**0.0728**	0.100	0.100	N/A	**78**	**73**	46-115	7	15	
Endrin	**0.0796**	**0.0737**	0.100	0.100	N/A	**80**	**74**	52-124	8	15	
4,4'-DDD	**0.0848**	**0.0782**	0.100	0.100	N/A	**85**	**78**	52-121	8	15	
Endosulfan II	**0.0709**	**0.0660**	0.100	0.100	N/A	**71**	**66**	44-114	7	15	
4,4'-DDT	**0.0894**	**0.0834**	0.100	0.100	N/A	**89**	**83**	48-123	7	15	
Endrin Aldehyde	**0.0687**	**0.0643**	0.100	0.100	N/A	**69**	**64**	45-114	7	15	
Methoxychlor	**0.103**	**0.0975**	0.100	0.100	N/A	**103**	**97**	49-130	5	15	
Endosulfan Sulfate	**0.0712**	**0.0647**	0.100	0.100	N/A	**71**	**65**	39-117	10	15	
Endrin Ketone	**0.0748**	**0.0701**	0.100	0.100	N/A	**75**	**70**	53-119	6	15	
Surrogate:											
TCMX						*56*	*56*	*25-114*			
DCB						*70*	*83*	*30-137*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**83**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**6.5**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**96**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**2.8**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Arsenic	**8.6**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**29**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**12**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**1.4**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**250**	69	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**5.0**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Arsenic	**6.1**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**270**	69	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**9.4**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Arsenic	**5.6**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**64**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**42**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Arsenic	**4.2**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**150**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**16**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Arsenic	**4.1**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Arsenic	**3.8**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1103WM1					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Laboratory ID:	MB1103W1					
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	

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Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	10-289-08									
	ORIG	DUP								
Arsenic	**4.09**	**4.24**	NA	NA		NA	NA	4	20	
Barium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Laboratory ID:	10-289-08									
Mercury	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	10-289-08									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**112**	**116**	111	111	4.09	**97**	**100**	75-125	3	20
Barium	**121**	**124**	111	111	13.9	**97**	**99**	75-125	2	20
Cadmium	**108**	**108**	111	111	ND	**97**	**97**	75-125	0	20
Chromium	**107**	**108**	111	111	ND	**96**	**98**	75-125	1	20
Lead	**107**	**108**	111	111	ND	**96**	**97**	75-125	1	20
Selenium	**104**	**115**	111	111	ND	**94**	**104**	75-125	10	20
Silver	**106**	**108**	111	111	ND	**95**	**97**	75-125	2	20
Laboratory ID:	10-289-08									
Mercury	**12.1**	**12.0**	12.5	12.5	ND	**96**	**96**	75-125	0	20
SPIKE BLANK										
Laboratory ID:	SB1103WM1									
Arsenic	**122**		111		N/A	**110**	85-115			
Barium	**122**		111		N/A	**110**	85-115			
Cadmium	**117**		111		N/A	**105**	85-115			
Chromium	**119**		111		N/A	**108**	85-115			
Lead	**121**		111		N/A	**109**	85-115			
Selenium	**123**		111		N/A	**111**	85-115			
Silver	**125**		111		N/A	**113**	85-115			
Laboratory ID:	SB1103W1									
Mercury	**12.4**		12.5		N/A	**99**	80-120			

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*99*	*66-117*				
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*99*	*66-117*				
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Benzene	**7.8**	5.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*101*	*66-117*				
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*98*	*66-117*				
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Benzene	**18**	10	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*101*	*66-117*				

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Project: Whitmarsh Landfill

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

BENZENE
EPA 8021B
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W2					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*100*	*100*	*66-117*			
SPIKE BLANKS											
Laboratory ID:	SB1101W1										
	SB	SBD	SB	SBD		SB	SBD				
Benzene	**51.9**	**51.1**	50.0	50.0		**104**	**102**	80-116	2	11	
Surrogate:											
Fluorobenzene						*104*	*105*	*66-117*			

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

pH
SM 4500-H B

Matrix: Water
Units: pH (@ 25ºC)

Analyte	Result	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**				
Laboratory ID:	10-289-01				
pH	**6.9**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-2-102821**				
Laboratory ID:	10-289-02				
pH	**8.6**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MWD-21-1-102821**				
Laboratory ID:	10-289-03				
pH	**6.5**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-3-102821**				
Laboratory ID:	10-289-04				
pH	**7.2**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-4-102821**				
Laboratory ID:	10-289-05				
pH	**7.0**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-5-102821**				
Laboratory ID:	10-289-06				
pH	**6.5**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-6-102821**				
Laboratory ID:	10-289-07				
pH	**7.1**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-7-102821**				
Laboratory ID:	10-289-08				
pH	**7.0**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**DUP-1-102821**				
Laboratory ID:	10-289-09				
pH	**6.9**	SM 4500-H B	10-29-21	10-29-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**47**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**57**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Arsenic	**7.3**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**150**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**190**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**68**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Arsenic	**3.5**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Arsenic	**3.5**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029F1					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Laboratory ID:	MB1029F1					
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Arsenic	**3.46**	**3.80**	NA	NA		NA		NA	9	20	
Barium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	10-289-08										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**86.8**	**86.2**	80.0	80.0	3.46	**104**	**103**	75-125	1	20	
Barium	**91.8**	**91.4**	80.0	80.0	11.9	**100**	**99**	75-125	0	20	
Cadmium	**79.6**	**80.0**	80.0	80.0	ND	**100**	**100**	75-125	1	20	
Chromium	**74.8**	**75.8**	80.0	80.0	ND	**94**	**95**	75-125	1	20	
Lead	**79.0**	**79.6**	80.0	80.0	ND	**99**	**100**	75-125	1	20	
Selenium	**94.8**	**93.4**	80.0	80.0	ND	**119**	**117**	75-125	1	20	
Silver	**80.6**	**79.6**	80.0	80.0	ND	**101**	**100**	75-125	1	20	
Laboratory ID:	10-289-08										
Mercury	**11.8**	**11.5**	12.5	12.5	ND	**94**	**92**	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB1029F1										
Arsenic	**81.0**		80.0		N/A	**101**		85-115			
Barium	**82.4**		80.0		N/A	**103**		85-115			
Cadmium	**78.4**		80.0		N/A	**98**		85-115			
Chromium	**75.6**		80.0		N/A	**95**		85-115			
Lead	**83.0**		80.0		N/A	**104**		85-115			
Selenium	**88.0**		80.0		N/A	**110**		85-115			
Silver	**83.0**		80.0		N/A	**104**		85-115			
Laboratory ID:	SB1029F1										
Mercury	**12.1**		12.5		N/A	**97**		80-120			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Iron	**12000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Iron	**85000**	250	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Iron	**4600**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Iron	**20000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Iron	**17000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Iron	**16000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Iron	**17000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Iron	**900**	50	EPA 6010D	11-15-21	11-16-21	

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Iron	**630**	50	EPA 6010D	11-15-21	11-16-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1115WH3					
Iron	**ND**	50	EPA 6010D	11-15-21	11-16-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-01										
	ORIG	DUP									
Iron	**12500**	**12100**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	10-289-01										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**35100**	**35800**	20000	20000	12500	**113**	**117**	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1115WH3										
Iron	**22000**		20000		N/A	**110**		80-120			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Iron	**430**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Iron	**62000**	500	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Iron	**330**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Iron	**800**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Iron	**540**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Iron	**4400**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Iron	**570**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029F1					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Iron	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**24800**	**24600**	22200	22200	ND	**112**	**111**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB1029F1										
Iron	**24600**		22200		N/A	**111**		80-120			

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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 16 2021
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your WHITMARSH LANDFILL project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-21-1-102721	Water	21-A016741	CONV
MW-21-2-102821	Water	21-A016742	CONV
MWD-21-1-102821	Water	21-A016743	CONV
MW-21-3-102821	Water	21-A016744	CONV
MW-21-4-102821	Water	21-A016745	CONV
MW-21-5-102821	Water	21-A016746	CONV
MW-21-6-102821	Water	21-A016747	CONV
MW-21-7-102821	Water	21-A016748	CONV
DUP-1-102821	Water	21-A016749	CONV

Your samples were received on Monday, November 1, 2021. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

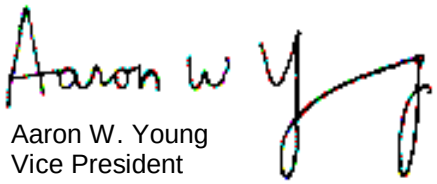
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Vice President

SDG #: 2121700
PO Number: 10-289

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: WHITMARSH LANDFILL
SDG Number: 2121700
PO Number: 10-289
All results reported on an as received basis.

Date Received: 11/01/21
Date Reported: 11/16/21

AMTEST Identification Number **21-A016741**
Client Identification **MW-21-1-102721**
Sampling Date **10/27/21, 11:47**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.85	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016742**
Client Identification **MW-21-2-102821**
Sampling Date **10/28/21, 09:15**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.31	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016743**
Client Identification **MWD-21-1-102821**
Sampling Date **10/28/21, 10:55**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016744**
Client Identification **MW-21-3-102821**
Sampling Date **10/28/21, 12:28**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.26	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016745**
Client Identification **MW-21-4-102821**
Sampling Date **10/28/21, 13:58**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.29	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016746**
Client Identification **MW-21-5-102821**
Sampling Date **10/28/21, 15:05**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016747**
Client Identification **MW-21-6-102821**
Sampling Date **10/28/21, 16:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016748**
Client Identification **MW-21-7-102821**
Sampling Date **10/28/21, 17:30**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.24	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016749**
Client Identification **DUP-1-102821**
Sampling Date **10/28/21, 17:30**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.24	g/kg		0.05	SM 2520B	KW	11/03/21

Aaron W. Young
Vice President

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-289

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: Whitmarsh Landfill

Project Name:

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
	MW-21-1-102721 16741	10/27/21	11:47	W	1	Salinity SM2520D
	MW-21-2-102821 42	10/28/21	9:15	W	1	Salinity SM2520D
	MW-21-1-102821 43	10/28/21	10:55	W	1	Salinity SM2520D
	MW-21-3-102821 44	10/28/21	12:28	W	1	Salinity SM2520D
	MW-21-4-102821 45	10/28/21	13:58	W	1	Salinity SM2520D
	MW-21-5-102821 46	10/28/21	15:05	W	1	Salinity SM2520D
	MW-21-6-102821 47	10/28/21	16:20	W	1	Salinity SM2520D
	MW-21-7-102821 48	10/28/21	17:30	W	1	Salinity SM2520D
	DUP-1-102821 49	10/28/21	17:30	W	1	Salinity SM2520D

	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	11/1/21	1208	
Received by:	AMTEST T=4.4	11/1/21	1208	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

P.6

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Wood E&I
Project Number:
Project Name: Whitmarsh Landfill
Project Manager: Kaorus Tahghighi
Sampled by: Cheyenne Ginther

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 10-289

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers
1	MW-21-1-102721	10/27/21	1147		11
2	MW-21-2-102821	10/28/21	915		11
3	MW-21-1-102821		1055		11
4	MW-21-3-102821		1228		11
5	MW-21-4-102821		1359		11
6	MW-21-5-102821		1505		11
7	MW-21-6-102821		1620		11
8	MW-21-7-102821		1730		20
9	DUP-1-102821		1730		11

Lab ID	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total ~~MTCA~~ Metals IRON	~~TCLP Metals~~ DISSOLVED IRON	HEM (oil and grease) 1664A	Benzene EPA 8021B	Salinity + pH	Dissolved RCRA Metals EPA 200.8/ 7470A	% Moisture
1								2		2	2			1	X	X		3			
2															X	X			X		
3															X	X					
4															X	X					
5															X	X					
6															X	X					
7															X	X					
8															X	X					
9															X	X					

	Signature	Company	Date	Time
Relinquished	Cheyenne Ginther	Wood E&I	10/29/21	1412
Received		OSE	10/29/21	1412
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
Call Kaorus Tahghighi 206-641-6301 if questions. (X) Added 11/10/21, DB (ST4)

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 15, 2022

Koorus Tahghighi
Wood Environment and Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA 98101

Re: Analytical Data for Project PS21204410.02.****
Laboratory Reference No. 2201-245

Dear Koorus:

Enclosed are the analytical results and associated quality control data for samples submitted on January 28, 2022.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

Case Narrative

Samples were collected on January 28, 2022 and received by the laboratory on January 28, 2022. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Semivolatiles EPA 8270E/SIM Analysis

The matrix spike duplicate had one recovery above control limits, which is believed to be caused by the sample matrix. The spike blank/spike blank duplicate pair extracted with this batch had all parameters in control, no further action was deemed necessary.

PCBs EPA 8082A Analysis

Sample MW-21-6-012722 was used as the MS/MSD. The percent recovery values (%R) for Aroclor 1260 were below the quality control limits of 80-119%. This is attributed to the matrix effects of the sample on the instrument and no further action was performed.

Organochlorine Pesticides by EPA 8081B Analysis

Sample MW-21-6-012722 was used as the MS/MSD. Due to severe effects of the matrix on the instrument, the percent recovery value (%R) for delta-BHC was below the quality control limits of 50-130% in the MS. As a result, the RPD (24%) was above the quality control limit of 15%. The Spike Blank and Spike Blank Duplicate were within quality control limits and no further action was performed.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**1.2**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
2,4-Dinitrophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.45**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**0.34**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*36*	*10 - 92*				
Nitrobenzene-d5	*81*	*32 - 105*				
2-Fluorobiphenyl	*82*	*38 - 105*				
2,4,6-Tribromophenol	*105*	*25 - 124*				
Terphenyl-d14	*85*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**3.1**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**1.0**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**0.22**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**4.5**	1.0	EPA 8270E	2-1-22	2-2-22	
1-Methylnaphthalene	**9.0**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**1.6**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**1.0**	1.0	EPA 8270E	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**1.3**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**1.1**	1.0	EPA 8270E	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*49*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*77*	*32 - 105*				
2-Fluorobiphenyl	*79*	*38 - 105*				
2,4,6-Tribromophenol	*100*	*25 - 124*				
Terphenyl-d14	*84*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
n-Nitrosodimethylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.2	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
2,4-Dinitrophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*46*	*10 - 82*				
Phenol-d6	*33*	*10 - 92*				
Nitrobenzene-d5	*73*	*32 - 105*				
2-Fluorobiphenyl	*75*	*38 - 105*				
2,4,6-Tribromophenol	*96*	*25 - 124*				
Terphenyl-d14	*92*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
n-Nitrosodimethylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.14**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*80*	*32 - 105*				
2-Fluorobiphenyl	*78*	*38 - 105*				
2,4,6-Tribromophenol	*101*	*25 - 124*				
Terphenyl-d14	*83*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**0.33**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.28**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*49*	*10 - 82*				
Phenol-d6	*34*	*10 - 92*				
Nitrobenzene-d5	*79*	*32 - 105*				
2-Fluorobiphenyl	*80*	*38 - 105*				
2,4,6-Tribromophenol	*100*	*25 - 124*				
Terphenyl-d14	*88*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
n-Nitrosodimethylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Phenol	**1.8**	0.97	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**20**	0.97	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**28**	0.97	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**140**	9.7	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**0.69**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**1.1**	0.97	EPA 8270E	2-1-22	2-2-22	
1-Methylnaphthalene	**0.78**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.19	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.015	EPA 8270E/SIM	2-1-22	2-2-22	U1
Chrysene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*83*	*32 - 105*				
2-Fluorobiphenyl	*84*	*38 - 105*				
2,4,6-Tribromophenol	*104*	*25 - 124*				
Terphenyl-d14	*112*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**51**	20	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**56**	20	EPA 8270E	2-1-22	2-4-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**470**	20	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**4.9**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**3.7**	1.0	EPA 8270E	2-1-22	2-3-22	
1-Methylnaphthalene	**3.5**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**2.3**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**0.43**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	U1
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Fluorene	**1.0**	1.0	EPA 8270E	2-1-22	2-3-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**21**	5.1	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**0.33**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.23	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.014	EPA 8270E/SIM	2-1-22	2-2-22	U1
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*31*	*10 - 82*				
Phenol-d6	*24*	*10 - 92*				
Nitrobenzene-d5	*32*	*32 - 105*				
2-Fluorobiphenyl	*59*	*38 - 105*				
2,4,6-Tribromophenol	*79*	*25 - 124*				
Terphenyl-d14	*89*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
n-Nitrosodimethylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroisopropyl)ether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
n-Nitroso-di-n-propylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethoxy)methane	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Diethylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Fluorene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*44*	*10 - 82*				
Phenol-d6	*32*	*10 - 92*				
Nitrobenzene-d5	*73*	*32 - 105*				
2-Fluorobiphenyl	*77*	*38 - 105*				
2,4,6-Tribromophenol	*99*	*25 - 124*				
Terphenyl-d14	*88*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**60**	21	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**70**	21	EPA 8270E	2-1-22	2-4-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**590**	21	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**9.5**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**6.6**	1.0	EPA 8270E	2-1-22	2-3-22	
1-Methylnaphthalene	**5.4**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**3.2**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.12	EPA 8270E/SIM	2-1-22	2-2-22	U1
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**0.68**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.6	EPA 8270E	2-1-22	2-3-22	U1
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Fluorene	**1.3**	1.0	EPA 8270E	2-1-22	2-3-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**26**	5.1	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**0.35**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.29	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*37*	*10 - 92*				
Nitrobenzene-d5	*48*	*32 - 105*				
2-Fluorobiphenyl	*91*	*38 - 105*				
2,4,6-Tribromophenol	*109*	*25 - 124*				
Terphenyl-d14	*66*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*30*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*71*	*38 - 105*				
2,4,6-Tribromophenol	*92*	*25 - 124*				
Terphenyl-d14	*91*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Phenol	**13.4**	**15.4**	40.7	39.9	ND	33	39	20 - 108	14	24	
2-Chlorophenol	**26.2**	**29.8**	40.7	39.9	ND	64	75	24 - 105	13	32	
1,4-Dichlorobenzene	**12.7**	**14.5**	20.3	19.9	ND	63	73	24 - 100	13	36	
n-Nitroso-di-n-propylamine	**18.2**	**19.7**	20.3	19.9	ND	90	99	21 - 143	8	30	
1,2,4-Trichlorobenzene	**13.8**	**16.1**	20.3	19.9	ND	68	81	34 - 105	15	34	
4-Chloro-3-methylphenol	**28.0**	**30.8**	40.7	39.9	ND	69	77	44 - 113	10	21	
Acenaphthene	**14.7**	**16.5**	20.3	19.9	ND	72	83	47 - 106	12	19	
4-Nitrophenol	**19.3**	**21.6**	40.7	39.9	ND	47	54	20 - 127	11	37	
2,4-Dinitrotoluene	**16.0**	**17.2**	20.3	19.9	ND	79	86	45 - 106	7	19	
Pentachlorophenol	**74.0**	**81.7**	40.7	39.9	21.4	129	151	20 - 136	10	39	V
Pyrene	**18.4**	**19.4**	20.3	19.9	ND	91	97	47 - 112	5	23	
Surrogate:											
2-Fluorophenol						*43*	*55*	*10 - 82*			
Phenol-d6						*33*	*38*	*10 - 92*			
Nitrobenzene-d5						*40*	*47*	*32 - 105*			
2-Fluorobiphenyl						*79*	*87*	*38 - 105*			
2,4,6-Tribromophenol						*90*	*102*	*25 - 124*			
Terphenyl-d14						*101*	*115*	*42 - 116*			
SPIKE BLANKS											
Laboratory ID:	SB0201W2										
	SB	SBD	SB	SBD		SB	SBD				
Phenol	**14.5**	**15.3**	40.0	40.0		36	38	21 - 53	5	26	
2-Chlorophenol	**30.1**	**30.7**	40.0	40.0		75	77	38 - 92	2	28	
1,4-Dichlorobenzene	**13.8**	**13.3**	20.0	20.0		69	67	30 - 88	4	32	
n-Nitroso-di-n-propylamine	**15.3**	**13.6**	20.0	20.0		77	68	40 - 103	12	27	
1,2,4-Trichlorobenzene	**16.1**	**16.0**	20.0	20.0		81	80	37 - 95	1	29	
4-Chloro-3-methylphenol	**38.5**	**39.8**	40.0	40.0		96	100	50 - 101	3	17	
Acenaphthene	**15.3**	**15.2**	20.0	20.0		77	76	46 - 97	1	19	
4-Nitrophenol	**21.3**	**22.2**	40.0	40.0		53	56	23 - 64	4	34	
2,4-Dinitrotoluene	**16.1**	**16.1**	20.0	20.0		81	81	46 - 100	0	17	
Pentachlorophenol	**47.1**	**49.1**	40.0	40.0		118	123	39 - 123	4	29	
Pyrene	**19.4**	**18.0**	20.0	20.0		97	90	52 - 107	7	19	
Surrogate:											
2-Fluorophenol						*58*	*57*	*10 - 82*			
Phenol-d6						*39*	*40*	*10 - 92*			
Nitrobenzene-d5						*90*	*81*	*32 - 105*			
2-Fluorobiphenyl						*82*	*85*	*38 - 105*			
2,4,6-Tribromophenol						*104*	*106*	*25 - 124*			
Terphenyl-d14						*97*	*93*	*42 - 116*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Aroclor 1016	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Aroclor 1016	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**0.11**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*78*	*42-140*				
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Aroclor 1016	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*87*	*42-140*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Aroclor 1016	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*95*	*42-140*				
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Aroclor 1016	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.56	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.056	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*93*	*42-140*				
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Aroclor 1016	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.49	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Aroclor 1016	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.52	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.052	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*101*	*42-140*				
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Aroclor 1016	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*101*	*42-140*				
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Aroclor 1016	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.53	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*92*	*42-140*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1221	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1232	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1242	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1248	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1254	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1260	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*94*	*42-140*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Aroclor 1260	**0.394**	**0.393**	0.505	0.568	ND	**78**	**69**	80-119	0	17	I,I
Surrogate:											
DCB						*84*	*96*	*42-140*			
SPIKE BLANKS											
Laboratory ID:	SB0131W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.430**	**0.417**	0.500	0.500	N/A	**86**	**83**	73-131	3	12	
Surrogate:											
DCB						*90*	*84*	*42-140*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
alpha-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0021	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**0.0058**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.021	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.053	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*62*	*25-114*				
DCB	*72*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
alpha-BHC	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**0.017**	0.0054	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**0.0061**	0.0054	EPA 8081B	1-31-22	2-2-22	P
Heptachlor	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0021	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**0.012**	0.0054	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.017**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**0.0074**	0.0054	EPA 8081B	1-31-22	2-2-22	P
Endrin Ketone	**ND**	0.021	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.054	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*64*	*25-114*				
DCB	*71*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
alpha-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0029	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.0098	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.049	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*75*	*25-114*				
DCB	*77*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
alpha-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.0073**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.010	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.050	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*65*	*25-114*				
DCB	*82*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
alpha-BHC	**0.0073**	0.0056	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Aldrin	**0.43**	0.022	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.089**	0.0033	EPA 8081B	1-31-22	2-2-22	P
gamma-Chlordane	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.20**	0.056	EPA 8081B	1-31-22	2-8-22	
Endosulfan I	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endrin	**0.061**	0.0056	EPA 8081B	1-31-22	2-2-22	P
4,4'-DDD	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**0.048**	0.0056	EPA 8081B	1-31-22	2-2-22	P
4,4'-DDT	**0.014**	0.0056	EPA 8081B	1-31-22	2-2-22	P
Endrin Aldehyde	**0.011**	0.0056	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.022	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.056	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*64*	*25-114*				
DCB	*88*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
alpha-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Aldrin	**0.68**	0.020	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.093**	0.030	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.49**	0.049	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.086**	0.049	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.34**	0.049	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDD	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.27**	0.049	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**0.38**	0.049	EPA 8081B	1-31-22	2-8-22	
Endrin Aldehyde	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Methoxychlor	**0.11**	0.099	EPA 8081B	1-31-22	2-8-22	P
Endosulfan Sulfate	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Endrin Ketone	**ND**	0.20	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	0.49	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
alpha-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	1.0	EPA 8081B	1-31-22	2-8-22	U1
Aldrin	**2.1**	0.041	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.29**	0.062	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.67**	0.10	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.22**	0.10	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.61**	0.10	EPA 8081B	1-31-22	2-8-22	
4,4'-DDD	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.27**	0.10	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Endrin Aldehyde	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Methoxychlor	**ND**	0.21	EPA 8081B	1-31-22	2-8-22	
Endosulfan Sulfate	**0.12**	0.10	EPA 8081B	1-31-22	2-8-22	
Endrin Ketone	**ND**	0.41	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	1.0	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
alpha-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
gamma-BHC (Lindane)	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
beta-BHC	**0.0061**	0.0049	EPA 8081B	1-31-22	2-7-22	P
delta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Heptachlor	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Aldrin	**0.0028**	0.0020	EPA 8081B	1-31-22	2-7-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	2-7-22	
gamma-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
alpha-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDE	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endosulfan I	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Dieldrin	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDD	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endosulfan II	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDT	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin Aldehyde	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Methoxychlor	**ND**	0.0099	EPA 8081B	1-31-22	2-7-22	
Endosulfan Sulfate	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-7-22	
Toxaphene	**ND**	0.049	EPA 8081B	1-31-22	2-7-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*52*	*25-114*				
DCB	*56*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
alpha-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Aldrin	**2.5**	0.042	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.34**	0.063	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.68**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.26**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.63**	0.11	EPA 8081B	1-31-22	2-8-22	
4,4'-DDD	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.23**	0.11	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**0.17**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin Aldehyde	**0.11**	0.11	EPA 8081B	1-31-22	2-8-22	P
Methoxychlor	**ND**	0.21	EPA 8081B	1-31-22	2-8-22	
Endosulfan Sulfate	**0.13**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin Ketone	**ND**	0.42	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	1.1	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*0*	*25-114*				
DCB	*0*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
beta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
delta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Heptachlor	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	1-31-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	1-31-22	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDE	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endosulfan I	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Dieldrin	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDD	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endosulfan II	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDT	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Methoxychlor	**ND**	0.010	EPA 8081B	1-31-22	1-31-22	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	1-31-22	
Toxaphene	**ND**	0.050	EPA 8081B	1-31-22	1-31-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*56*	*25-114*				
DCB	*100*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
alpha-BHC	**0.0713**	**0.0653**	0.103	0.0981	ND	**69**	**67**	50-130	9	15	
gamma-BHC (Lindane)	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
beta-BHC	**0.121**	**0.111**	0.103	0.0981	ND	**118**	**113**	50-130	9	15	
delta-BHC	**0.0461**	**0.0585**	0.103	0.0981	ND	**45**	**60**	50-130	24	15	I,L
Heptachlor	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Aldrin	**NA**	**NA**	0.103	0.0981	2.14	**NA**	**NA**	50-130	NA	15	Z
Heptachlor Epoxide	**NA**	**NA**	0.103	0.0981	0.292	**NA**	**NA**	50-130	NA	15	Z
gamma-Chlordane	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
alpha-Chlordane	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDE	**NA**	**NA**	0.103	0.0981	0.670	**NA**	**NA**	50-130	NA	15	Z
Endosulfan I	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Dieldrin	**NA**	**NA**	0.103	0.0981	0.215	**NA**	**NA**	50-130	NA	15	Z
Endrin	**NA**	**NA**	0.103	0.0981	0.609	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDD	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endosulfan II	**NA**	**NA**	0.103	0.0981	0.271	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDT	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endrin Aldehyde	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Methoxychlor	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endosulfan Sulfate	**0.104**	**0.0695**	0.103	0.0981	0.124	**NA**	**NA**	50-130	NA	15	A
Endrin Ketone	**0.0723**	**0.0839**	0.103	0.0981	ND	**70**	**86**	50-130	15	15	
Surrogate:											
TCMX						*55*	*64*	*25-114*			
DCB						*114*	*81*	*30-137*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB0131W2										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0789**	**0.0816**	0.100	0.100	N/A	**79**	**82**	42-113	3	19	
gamma-BHC (Lindane)	**0.0754**	**0.0785**	0.100	0.100	N/A	**75**	**78**	45-114	4	15	
beta-BHC	**0.0863**	**0.0869**	0.100	0.100	N/A	**86**	**87**	40-118	1	15	
delta-BHC	**0.0880**	**0.0801**	0.100	0.100	N/A	**88**	**80**	20-125	9	15	
Heptachlor	**0.0786**	**0.0739**	0.100	0.100	N/A	**79**	**74**	41-120	6	16	
Aldrin	**0.0742**	**0.0741**	0.100	0.100	N/A	**74**	**74**	35-115	0	15	
Heptachlor Epoxide	**0.0809**	**0.0810**	0.100	0.100	N/A	**81**	**81**	50-118	0	15	
gamma-Chlordane	**0.0783**	**0.0792**	0.100	0.100	N/A	**78**	**79**	46-110	1	15	
alpha-Chlordane	**0.0805**	**0.0807**	0.100	0.100	N/A	**80**	**81**	38-112	0	15	
4,4'-DDE	**0.0926**	**0.0922**	0.100	0.100	N/A	**93**	**92**	41-127	0	15	
Endosulfan I	**0.0901**	**0.0904**	0.100	0.100	N/A	**90**	**90**	45-119	0	15	
Dieldrin	**0.0890**	**0.0897**	0.100	0.100	N/A	**89**	**90**	46-115	1	15	
Endrin	**0.0862**	**0.0852**	0.100	0.100	N/A	**86**	**85**	52-124	1	15	
4,4'-DDD	**0.0885**	**0.0873**	0.100	0.100	N/A	**89**	**87**	52-121	1	15	
Endosulfan II	**0.0849**	**0.0811**	0.100	0.100	N/A	**85**	**81**	44-114	5	15	
4,4'-DDT	**0.0915**	**0.0865**	0.100	0.100	N/A	**91**	**87**	48-123	6	15	
Endrin Aldehyde	**0.0894**	**0.0870**	0.100	0.100	N/A	**89**	**87**	45-114	3	15	
Methoxychlor	**0.0850**	**0.0800**	0.100	0.100	N/A	**85**	**80**	49-130	6	15	
Endosulfan Sulfate	**0.0859**	**0.0849**	0.100	0.100	N/A	**86**	**85**	39-117	1	15	
Endrin Ketone	**0.0823**	**0.0820**	0.100	0.100	N/A	**82**	**82**	53-119	0	15	
Surrogate:											
TCMX						*59*	*58*	*25-114*			
DCB						*98*	*95*	*30-137*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Arsenic	**6.0**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**110**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**93**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**250**	69	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**290**	69	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**31**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**2.1**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**120**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Arsenic	**4.1**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**130**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
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Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131WM1					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Laboratory ID:	MB0201W1					
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	01-245-07									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Barium	**125**	**127**	NA	NA		NA	NA	2	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Laboratory ID:	01-245-07									
Mercury	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	01-245-07									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**113**	**109**	111	111	ND	**102**	**98**	75-125	4	20
Barium	**237**	**233**	111	111	125	**101**	**97**	75-125	2	20
Cadmium	**115**	**108**	111	111	ND	**104**	**97**	75-125	6	20
Chromium	**114**	**108**	111	111	ND	**103**	**97**	75-125	5	20
Lead	**107**	**103**	111	111	ND	**97**	**93**	75-125	4	20
Selenium	**109**	**101**	111	111	ND	**98**	**91**	75-125	7	20
Silver	**110**	**105**	111	111	ND	**99**	**94**	75-125	5	20
Laboratory ID:	01-245-07									
Mercury	**12.1**	**12.0**	12.5	12.5	ND	**97**	**96**	75-125	0	20
SPIKE BLANK										
Laboratory ID:	SB0131WM1									
Arsenic	**109**		111		N/A	**98**	85-115			
Barium	**111**		111		N/A	**100**	85-115			
Cadmium	**110**		111		N/A	**99**	85-115			
Chromium	**111**		111		N/A	**100**	85-115			
Lead	**111**		111		N/A	**100**	85-115			
Selenium	**96.0**		111		N/A	**87**	85-115			
Silver	**111**		111		N/A	**100**	85-115			
Laboratory ID:	SB0201W1									
Mercury	**12.1**		12.5		N/A	**96**	80-120			

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*66-117*				
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Benzene	**3.3**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*94*	*66-117*				
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Benzene	**4.3**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*102*	*66-117*				
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Benzene	**ND**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*104*	*66-117*				
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Benzene	**8.6**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*85*	*66-117*				

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Benzene	**ND**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Benzene	**14**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*105*	*66-117*				

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Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
Benzene	**ND**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*106*	*66-117*				
Laboratory ID:	MB0202W2					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Benzene	**8.64**	**8.47**	NA	NA		NA		NA	2	30	
Surrogate:											
Fluorobenzene						*85*	*85*	*66-117*			
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**59.6**	**56.5**	50.0	50.0	8.64	**102**	**96**	77-114	5	14	
Surrogate:											
Fluorobenzene						*98*	*94*	*66-117*			
SPIKE BLANKS											
Laboratory ID:	SB0201W1										
	SB		SB			SB					
Benzene	**54.4**		50.0			**109**		80-116	NA	NA	
Surrogate:											
Fluorobenzene						*113*		*66-117*			

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

pH
SM 4500-H B

Matrix: Water
Units: pH (@ 25ºC)

Analyte	Result	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**				
Laboratory ID:	01-245-01				
pH	**6.6**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-2-012622**				
Laboratory ID:	01-245-02				
pH	**6.4**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MWD-21-1-012622**				
Laboratory ID:	01-245-03				
pH	**8.2**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-3-012622**				
Laboratory ID:	01-245-04				
pH	**6.9**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-4-012722**				
Laboratory ID:	01-245-05				
pH	**7.2**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-5-012722**				
Laboratory ID:	01-245-06				
pH	**6.6**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-6-012722**				
Laboratory ID:	01-245-07				
pH	**7.1**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-7-012722**				
Laboratory ID:	01-245-08				
pH	**6.8**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-DUP-012722**				
Laboratory ID:	01-245-09				
pH	**7.1**	SM 4500-H B	1-28-22	1-28-22	

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Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**73**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**36**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**140**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**190**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**52**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Arsenic	**3.7**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**44**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0128F1					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Laboratory ID:	MB0128F1					
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Barium	**52.2**	**52.0**	NA	NA		NA		NA	0	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	01-245-07										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**92.2**	**92.0**	80.0	80.0	ND	**115**	**115**	75-125	0	20	
Barium	**127**	**126**	80.0	80.0	52.2	**93**	**93**	75-125	0	20	
Cadmium	**90.0**	**89.4**	80.0	80.0	ND	**113**	**112**	75-125	1	20	
Chromium	**73.6**	**73.2**	80.0	80.0	ND	**92**	**92**	75-125	1	20	
Lead	**74.8**	**75.0**	80.0	80.0	ND	**94**	**94**	75-125	0	20	
Selenium	**96.2**	**94.8**	80.0	80.0	ND	**120**	**119**	75-125	1	20	
Silver	**68.8**	**69.2**	80.0	80.0	ND	**86**	**87**	75-125	1	20	
Laboratory ID:	01-245-07										
Mercury	**11.8**	**12.2**	12.5	12.5	ND	**95**	**98**	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB0128F1										
Arsenic	**77.2**		80.0		N/A	**97**		85-115			
Barium	**80.4**		80.0		N/A	**101**		85-115			
Cadmium	**79.0**		80.0		N/A	**99**		85-115			
Chromium	**78.0**		80.0		N/A	**98**		85-115			
Lead	**75.2**		80.0		N/A	**94**		85-115			
Selenium	**70.8**		80.0		N/A	**89**		85-115			
Silver	**79.6**		80.0		N/A	**100**		85-115			
Laboratory ID:	SB0128F1										
Mercury	**12.2**		12.5		N/A	**98**		80-120			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Iron	**17000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Iron	**79000**	280	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Iron	**ND**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Iron	**22000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Iron	**14000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Iron	**9000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Iron	**17000**	56	EPA 6010D	2-1-22	2-1-11	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Iron	**ND**	56	EPA 6010D	2-1-22	2-10-11	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Iron	**16000**	56	EPA 6010D	2-1-22	2-14-11	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201WM1					
Iron	**ND**	56	EPA 6010D	2-1-22	2-1-11	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Iron	**16900**	**16800**	NA	NA		NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**36600**	**36900**	22200	22200	16900	**88**	**90**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0201WM1										
Iron	**21900**		22200		N/A	**99**		80-120			

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Iron	**4800**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Iron	**32000**	250	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Iron	**2200**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Iron	**620**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Iron	**2700**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Iron	**930**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Iron	**540**	56	EPA 6010D	1-28-22	2-10-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0128F1					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Iron	**930**	**918**	NA	NA		NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**22600**	**22800**	22200	22200	930	**98**	**99**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0128F1										
Iron	**22000**		22200		N/A	**99**		80-120			

This report pertains to the samples analyzed in accordance with the chain of custody,
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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z - Sample contained high levels of interferences that rendered this analyte unquantifiable.

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 4 2022
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-21-1-012622	Water	22-A001385	CONV
MW-21-2-012622	Water	22-A001386	CONV
MWD-21-1-012622	Water	22-A001387	CONV
MW-21-3-012622	Water	22-A001388	CONV
MW-21-4-012622	Water	22-A001389	CONV
MW-21-5-012622	Water	22-A001390	CONV
MW-21-6-012622	Water	22-A001391	CONV
MW-21-7-012622	Water	22-A001392	CONV
MW-21-DUP-012622	Water	22-A001393	CONV

Your samples were received on Monday, January 31, 2022. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

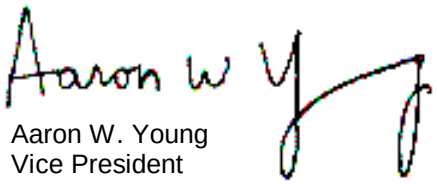
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Vice President

Project #: PS21204410.02.*
SDG #: 2222590
PO Number: 01-245

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
SDG Number: 2222590
Project #: PS21204410.02.*
PO Number: 01-245
All results reported on an as received basis.

Date Received: 01/31/22
Date Reported: 2/ 4/22

AMTEST Identification Number **22-A001385**
Client Identification **MW-21-1-012622**
Sampling Date **01/26/22, 12:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	2000	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.95	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001386**
Client Identification **MW-21-2-012622**
Sampling Date **01/26/22, 13:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	590	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.27	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001387**
Client Identification **MWD-21-1-012622**
Sampling Date **01/26/22, 14:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	540	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.25	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001388**
Client Identification **MW-21-3-012622**
Sampling Date **01/26/22, 15:43**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	610	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.28	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001389**
Client Identification **MW-21-4-012622**
Sampling Date **01/27/22, 10:15**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	630	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.29	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001390**
Client Identification **MW-21-5-012622**
Sampling Date **01/27/22, 11:37**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	330	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.15	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001391**
Client Identification **MW-21-6-012622**
Sampling Date **01/27/22, 13:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	510	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001392**
Client Identification **MW-21-7-012622**
Sampling Date **01/27/22, 14:38**

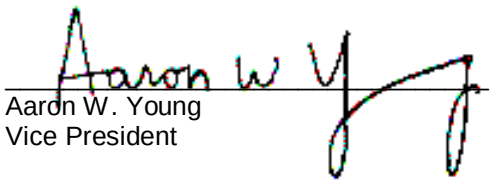
Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	520	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001393**
Client Identification **MW-21-DUP-012622**
Sampling Date **01/27/22, 13:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	520	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22



Aaron W. Young
Vice President

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 22-A001385 to 22-A001393

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
22-A001441	Conductivity	umhos/cm	64.	64.	0.00
22-A001445	Conductivity	umhos/cm	310	310	0.00
22-A001391	Conductivity	umhos/cm	510	510	0.00
22-a001391	Salinity	g/kg	0.24	0.24	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Conductivity	umhos/cm	200	200	100. %
Conductivity	umhos/cm	200	210	105. %
Conductivity	umhos/cm	200	200	100. %
Salinity	g/kg	0.10	0.10	100. %

BLANKS

ANALYTE	UNITS	RESULT
Conductivity	umhos/cm	< 0.5
Conductivity	umhos/cm	< 0.5
Conductivity	umhos/cm	< 0.5
Salinity	g/kg	< 0.05

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-245

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: PS21204410.02.****

Project Name: _____

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
85	MW-21-1-012622	1/26/22	12:12	W	1	Salinity SM 2520D
86	MW-21-2-012622	1/26/22	13:20	W	1	Salinity SM 2520D
87	MWD-21-1-012622	1/26/22	14:20	W	1	Salinity SM 2520D
88	MW-21-3-012622	1/26/22	15:43	W	1	Salinity SM 2520D
89	MW-21-4-012622	1/27/22	10:15	W	1	Salinity SM 2520D
90	MW-21-5-012622	1/27/22	11:37	W	1	Salinity SM 2520D
91	MW-21-6-012622	1/27/22	13:12	W	1	Salinity SM 2520D (Client QA/QC)
92	MW-21-7-012622	1/27/22	14:38	W	1	Salinity SM 2520D
93	MW-21-DUP-012622	1/27/22	13:12	W	1	Salinity SM 2520D

	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	1/31/22	1220	EIM
Received by:	AmTest	1/31/22	1220	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

5.4°C

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 01-245

Company: Wood E&I
Project Number: 8# PS21204410.02.****
Project Name: Skagit County (Whitmarsh) Landfill
Project Manager: Koorus Taghighi
Sampled by: Cheyenne G. & Cherie H.

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers
1	MW-21-1-01 26 22	1/26/22	1212	W	9
2	MW-21-2-01 26 22		1320		9
3	MW-21-1-01 26 22		1420		9
4	MW-21-3-01 26 22		1543		9
5	MW-21-4-01 27 22	1/27/22	1015		9
6	MW-21-5-01 27 22		1137		9
7	MW-21-6-01 27 22		1312		17
8	MW-21-7-01 27 22		1435		9
9	MW-21-DUP-01 27 22		1312		9

Lab ID	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	~~Total MTCA Metals~~ TOTAL IRON	~~TCLP Metals~~ DISSOLVED IRON	HEM (oil and grease) 1664A	Benzene EPA 8021B	Salinity + pH	Dissolved RCRA *	Metals EPA 200.8 / 7470A	% Moisture
1															X	X						
2															X	X						
3															X	X						
4															X	X						
5															X	X						
6															X	X						
7															X	X						
8															X	X						
9															X	X						

client QA/QC

X

	Signature	Company	Date	Time
Relinquished	Cheyenne Ginther	Wood E&I	1/28/22	1130
Received		CDE	1/28/22	1130
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
*lab filter
Call Koorus Taghighi 206-641-6301 if any questions
(Added 2/9/22. DB (STA))

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

Memo

To:	Koorus Tahghighi, Project Manager	Project:	PS21204410.02
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	February 25, 2022		

Subject: Summary Data Quality Review
Whitmarsh Landfill Groundwater Sampling
OnSite Laboratory Reference: 2110-289 and 2201-245

This memo presents the summary data quality review of eight primary groundwater samples and one groundwater field duplicate sample collected on October 27 and 28, 2021, as well as eight primary groundwater samples and one groundwater field duplicate sample collected on January 26 and 27, 2022. The samples were submitted to OnSite Environmental Inc. (OnSite), located in Redmond, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for the following:

- Semivolatile organic compounds (SVOCs) by U.S. Environmental Protection Agency (EPA) Method 8270E with selected ion monitoring;
- Benzene by EPA Method 8021B;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082A;
- Organochlorine pesticides by EPA Method 8021B;
- Total and dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Methods 200.8 and 7470A;
- Total and dissolved iron by EPA Method 6010D;
- pH by Standard Method (SM) 4500-H B;
- Conductivity by SM 2510B; and
- Salinity by SM 2520B.

The samples and the analyses conducted on the samples are listed below.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Sample ID	OnSite Laboratory Sample ID	Requested Analyses
October 2021 Samples – Work Order No. 2110-289		
MW-21-1-102721	10-289-01 / 21-A016741	All
MW-21-2-102821	10-289-02 / 21-A016742	All
MWD-21-1-102821	10-289-03 / 21-A016743	All
MW-21-3-102821	10-289-04 / 21-A016744	All
MW-21-4-102821	10-289-05 / 21-A016745	All
MW-21-5-102821	10-289-06 / 21-A016746	All
MW-21-6-102821	10-289-07 / 21-A016747	All
MW-21-7-102821	10-289-08 / 21-A016748	All
DUP-1-102821	10-289-09 / 21-A016749	All
January 2022 Samples – Work Order No. 2201-245		
MW-21-1-012622	01-245-01 / 22-A001385	All
MW-21-2-012622	01-245-02 / 22-A001386	All
MWD-21-1-012622	01-245-03 / 22-A001387	All
MW-21-3-012622	01-245-04 / 22-A001388	All
MW-21-4-012622	22-A001389	Conductivity and salinity
MW-21-4-012722	01-245-05	All except conductivity and salinity
MW-21-5-012622	22-A001390	Conductivity and salinity
MW-21-5-012722	01-245-06	All except conductivity and salinity
MW-21-6-012622	22-A001391	Conductivity and salinity
MW-21-6-012722	01-245-07	All except conductivity and salinity
MW-21-7-012622	22-A001392	Conductivity and salinity
MW-21-7-012722	01-245-08	All except conductivity and salinity
MW-21-DUP-012622	22-A001393	Conductivity and salinity
MW-21-DUP-012722	01-245-09	All except conductivity and salinity

Data were reviewed in accordance with the appropriate procedures and criteria per the method documention. The most current control limits provided by the laboratory were used to evaluate the quality control data.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014a and b).

OnSite received the samples on October 29, 2021, and January 28, 2022. The temperatures of the coolers were recorded upon receipt and were below the maximum acceptable temperature of 6 degrees Celsius.

Organic analyses

Samples were analyzed for SVOCs and benzene. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable as noted:

   For the October 2021 samples, 4-nitrophenol was recovered above the 23–64 percent control limits in the LCS and LCSD. There were no detections of 4-nitrophenol in the associated samples, and the high bias had no effect on the data.

5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was above recovery limits for pentachlorophenol in the MSD, and the concentration in the unspiked native sample was less than four times the amount of spike added. Associated sample MW-21-6-012722 should be flagged with a "J" when reporting to indicate the value is an estimate.

6. Field Duplicates – Acceptable as noted:

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate relative percent differences (RPDs) is 30 percent for concentrations greater than five times the reporting limit. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC." In these cases, the absolute value of the difference between the primary and duplicate result should not exceed the value of the reporting limit. The analytes listed in the table below for the October 2021 samples were detected in the duplicate sample, but not the primary sample. These results should be flagged with a "J" for detected and "UJ" for non-detects when reporting to indicate the value is an estimate. The field duplicate RPDs for the January 2022 samples were within the control limits, with the exception of naphthalene, 2-mehtylnaphthalene, 1-methylnaphthalene, acenaphthene, and benzene. The RPD for the results of these analytes exceeded the RPD and should be flagged with a "J" when reporting to indicate the value is an estimate.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	PQL[1] (µg/L)	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	Benzo[a]anthracene	ND	0.011	0.0096/0.010	NC
	Chrysene	ND	0.021	0.0096/0.010	NC
	Benzo[b]fluoranthene	ND	0.016	0.0096/0.010	NC
	Benzo[a]pyrene	ND	0.012	0.0096/0.010	NC
	Benzo[g,h,i]perylene	ND	0.011	0.0096/0.010	NC
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	(o-Cresol)	51	60	20/21	16
	(m,p-Cresol)	56	70	20/21	22
	2,4-Dimethylphenol	470	590	20/21	23
	Naphthalene	4.9	9.5	1.0/1.0	64
	2-Methylnaphthalene	3.7	6.6	1.0/1.0	56
	1-Methylnaphthalene	3.5	5.4	1.0/1.0	43
	2,4,5-Trichlorophenol	2.3	3.2	1.0/1.0	NC
	Acenaphthene	0.43	0.68	0.10/0.10	45
	Fluorene	1.0	1.3	1.0/1.0	NC
	Pentachlorophenol	21	26	5.1/5.1	21
	Phenanthrene	0.33	0.35	0.10/0.10	NC
	Benzene	8.6	14	1.0/4.0	48

Note:
1. The first number in the PQL column is the PQL for the primary sample, the second is the PQL for the duplicate sample.

Abbreviations:
µg/L = micrograms per liter
NC = not calculated
PQL = practical quantitation limit
RPD = relative percent difference

7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For the January 2022 samples, the reporting limits for numerous SVOCs were elevated due to interfences present in the sample. The U1 on the laboratory results should be converted to a "UJ" flag for reporting purposes.

Polychlorinated Biphenyl Analysis

Samples were analyzed for PCB Aroclors. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was below control limits for Aroclor 1260 in the MS and MSD, and the concentration in the unspiked native sample was less than four times the amount of spike added. Associated sample MW-21-6-012722 should be flagged with a "UJ" when reporting to indicate the value is an estimate.
6. Field Duplicates – Acceptable as noted:

   For both sample events, all Aroclors were below detection limits for both the parent and duplicate sample. The RPD is not calculated for non-detect results. The field duplicate is assumed to be within control limits and results are not flagged for use.
7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For both sample events, reporting limits for numerous Aroclors were elevated due to interfences present in the sample. The U1 on the laboratory results should be converted to a "UJ" flag for reporting purposes.

Pesticides Analysis

Samples were analyzed for organochlorine pesticides. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable as noted:

   For the October 2021 samples, surrogates were below control limits for samples MW-21-5-102821 and MW-21-6-102821 due to the high dilution necessary to analyze the sample.

   For the January 2022 samples, surrogates were below control limits for samples MW-21-5-012722, MW-21-6-012722, and MW-21-DUP-012722, due to the high dilution necessary to analyze the sample.

   Wood does not assess surrogate recoveries for samples that were analyzed at a dilution higher than 1:5.
4. LCS – Acceptable

5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was below control limits for multiple analytes in the MS. This is likely due to the high dilution necessary to analyze the sample and results are not flagged for use.

6. Laboratory Duplicates – Acceptable

7. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit.

   For the October 2021 samples, all analytes were below detection limits for both the primary and duplicate sample, except aldrin in the primary sample. The RPD is not calculated for non-detect results. The difference between the reporting limit for the two results is 0.0001 µg/L with the detection just above the reporting limit. These results are not qualified for use.

   For the January 2022 samples, the field duplicate RPDs were within the control limits.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	PQL[1] (µg/L)	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	Aldrin	0.0022	ND	0.0021/0.0020	NC
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	Aldrin	2.1	2.5	0.041/0.042	17
	Heptachlor Epoxide	0.29	0.34	0.062/0.063	16
	4,4'-DDE	0.67	0.68	0.10/0.11	1
	Dieldrin	0.22	0.26	0.10/0.11	NC
	Endrin	0.61	0.63	0.10/0.11	3
	Endosulfan II	0.27	0.23	0.10/0.11	NC
	Endosulfan Sulfate	0.12	0.13	0.10/0.11	NC

Note:
1. The first number in the PQL column is the PQL for the primary sample, the second is the PQL for the duplicate sample.

Abbreviations:
µg/L = micrograms per liter
4,4'-DDE = 4,4'-dichlorodiphenyldichloroethylene
NC = not calculated
PQL = practical quantitation limit
RPD = relative percent difference

8. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For both October 2021 and January 2022 samples, the RPDs for detected concentrations between the two columns were greater than 40 percent in numerous pesticides. The "P" on the laboratory results should be changed to a "J" flag for reporting purposes.

Inorganic analyses

Samples were analyzed for total and dissolved metals, pH, conductivity, and salinity. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS – Acceptable
4. MS/MSD – Acceptable
5. Laboratory Duplicates – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit. The field duplicate RPDs were within the control limits with the exception of total iron in October 2021 and dissolved iron in January 2022; these results should be flagged with a "J" when reporting to indicate the results are an estimate.

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	PQL	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	pH	7.0 SU	6.9 SU	NA	1.4
	Arsenic (total)	4.1 µg/L	3.8 µg/L	3.3 µg/L	7.6
	Arsenic (dissolved)	3.5 µg/L	3.5 µg/L	3.0 µg/L	0
	Iron (total)	900 µg/L	630 µg/L	50 µg/L	35
	Iron (dissolved)	ND	ND	56 µg/L	NC
	Salinity	0.24 g/kg	0.24 g/kg	0.05 g/kg[1]	0
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	pH	7.1 SU	7.1 SU	NA	0
	Barium (total)	120 µg/L	130 µg/L	28	8
	Barium (dissolved)	52 µg/L	44 µg/L	25	17
	Iron (total)	17,000	16,000	56	6
	Iron (dissolved)	930	540	56	53
MW-21-6-012622/ MW-21-DUP-012622	Conductivity	510 µmhos/cm	520 µmhos/cm	0.5[1]	1.9
	Salinity	0.24 g/kg	0.24 g/kg	0.05[1]	0

Note:
1. Salinity and conductivity have detection limits rather than PQLs.

Abbreviations:
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter
g/kg = grams per kilogram
NA = not applicable
ND = not detected
PQL = practical quantitation limit
RPD = relative percent difference
SU = Standard Units

7. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order numbers 2110-289 and 2201-245 is 100 percent. The usefulness of these data was evaluated based on the EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
October 2021 Samples – Work Order No. 2110-289				
MW-21-2-102821	n-Nitrosodiphenylamine	Elevated PQL	1.8 µg/L	UJ
MW-21-4-102821	PCB-Aroclor 1016	Elevated PQL	0.25 µg/L	UJ
	PCB-Aroclor 1221		0.25 µg/L	
	PCB-Aroclor 1232		0.25 µg/L	
	PCB-Aroclor 1242		0.25 µg/L	
	PCB-Aroclor 1248		5.0 µg/L	
	PCB-Aroclor 1254		0.25 µg/L	
	PCB-Aroclor 1260		0.050 µg/L	
	Aldrin	Dual column RPD > 40%	0.33 µg/L	J
	4,4'-DDE		0.23 µg/L	
	Endosulfan I		0.052 µg/L	
	4,4'-DDT		0.010 µg/L	
	Methoxychlor		0.014 µg/L	
MW-21-5-102821	Acenaphthene	Elevated PQL	0.21 µg/L	UJ
	PCB-Aroclor 1016	Elevated PQL	0.96 µg/L	UJ
	PCB-Aroclor 1221		0.96 µg/L	
	PCB-Aroclor 1232		0.96 µg/L	
	PCB-Aroclor 1242		0.96 µg/L	
	PCB-Aroclor 1248		4.8 µg/L	
	PCB-Aroclor 1254		0.96 µg/L	
	PCB-Aroclor 1260		0.048 µg/L	
	Aldrin	Dual column RPD > 40%	0.22 µg/L	J
	Heptachlor Epoxide		0.14 µg/L	
	Endosulfan I		0.21 µg/L	
	Dieldrin		0.086 µg/L	
	Endrin Aldehyde		0.19 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-6-102821	Flouranthene	Elevated PQL	0.62 µg/L	UJ
	PCB-Aroclor 1016	Elevated PQL	0.25 µg/L	UJ
	PCB-Aroclor 1221		0.25 µg/L	
	PCB-Aroclor 1232		0.25 µg/L	
	PCB-Aroclor 1242		0.25 µg/L	
	PCB-Aroclor 1248		5.0 µg/L	
	PCB-Aroclor 1254		0.25 µg/L	
	PCB-Aroclor 1260		0.050 µg/L	
	gamma-BHC (Lindane)	Dual column RPD > 40%	0.069 µg/L	J
	beta-BHC		0.10 µg/L	
	Heptachlor		0.054 µg/L	
	Aldrin		3.2 µg/L	
	Heptachlor Epoxide		0.37 µg/L	
	gamma-Chlordane		1.1 µg/L	
	alpha-Chlordane		0.28 µg/L	
	4,4'-DDE		0.32 µg/L	
	Endosulfan I		0.44 µg/L	
	Endosulfan Sulfate		0.060 µg/L	
MW-21-7-102821	Benz[a]anthracene	Absolute value difference > PQL	0.0096 µg/L	UJ
	Chrysene		0.0096 µg/L	
	Benzo(b)fluoranthene		0.0096 µg/L	
	Benzo(a)pyrene		0.0096 µg/L	
	Benzo(ghi)perylene		0.0096 µg/L	
	Iron (total)	Field Dup RPD > 30%	900 µg/L	J
	Aldrin	Dual column RPD > 40%	0.0022 µg/L	J
DUP-1-102821	Benz[a]anthracene	Absolute value difference > PQL	0.011 µg/L	J
	Chrysene		0.021 µg/L	
	Benzo(b)fluoranthene		0.016 µg/L	
	Benzo(a)pyrene		0.012 µg/L	
	Benzo(ghi)perylene		0.011 µg/L	
	Iron (total)	Field Dup RPD > 30%	630 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
January 2022 Samples – Work Order No. 2201-245				
MW-21-2-012622	delta-BHC	Dual column RPD > 40%	0.0061 µg/L	J
	Endosulfan Sulfate		0.0074 µg/L	
MW-21-4-012722	Aldrin	Dual column RPD > 40%	0.43 µg/L	J
	Heptachlor Epoxide		0.089 µg/L	
	Endrin		0.061 µg/L	
	Endosulfan II		0.048 µg/L	
	4,4'-DDT		0.014 µg/L	
	PCB-Aroclor 1016	Elevated PQL	5.6 µg/L	UJ
	PCB-Aroclor 1221		5.6 µg/L	
	PCB-Aroclor 1232		5.6 µg/L	
	PCB-Aroclor 1242		5.6 µg/L	
	PCB-Aroclor 1248		5.6 µg/L	
	PCB-Aroclor 1254		0.56 µg/L	
MW-21-5-012722	Fluoranthene	Elevated PQL	0.19 µg/L	UJ
	Benz[a]anthracene		0.015 µg/L	
	PCB-Aroclor 1016		4.9 µg/L	
	PCB-Aroclor 1221		4.9 µg/L	
	PCB-Aroclor 1232		4.9 µg/L	
	PCB-Aroclor 1242		4.9 µg/L	
	PCB-Aroclor 1248		4.9 µg/L	
	PCB-Aroclor 1254		0.49 µg/L	
	Aldrin	Dual column RPD > 40%	0.68 µg/L	J
	Heptachlor Epoxide		0.093 µg/L	
	4,4'-DDE		0.49 µg/L	
	Dieldrin		0.086 µg/L	
	Endrin		0.34 µg/L	
	Endosulfan II		0.27 µg/L	
	Methoxychlor		0.11 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-6-012722	2,3,4,6-Tetrachlorophenol	Elevated PQL	1.3 µg/L	UJ
	Fluoranthene		0.23 µg/L	
	Benz[a]anthracene		0.014 µg/L	
	PCB-Aroclor 1016		5.2 µg/L	
	PCB-Aroclor 1221		5.2 µg/L	
	PCB-Aroclor 1232		5.2 µg/L	
	PCB-Aroclor 1242		5.2 µg/L	
	PCB-Aroclor 1248		5.2 µg/L	
	PCB-Aroclor 1254		0.52 µg/L	
	PCB-Aroclor 1260	MS/MSD low	0.052 µg/L	UJ
	Heptachlor	Elevated PQL	1.0 µg/L	UJ
	Aldrin	Dual column RPD > 40%	2.1 µg/L	J
	Heptachlor Epoxide		0.29 µg/L	
	4,4'-DDE		0.67 µg/L	
	Dieldrin		0.22 µg/L	
	Endosulfan II		0.27 µg/L	
	Naphthalene	Field Dup RPD > 30%	4.9 µg/L	J
	2-Methylnaphthalene		3.7 µg/L	
	1-Methylnaphthalene		3.5 µg/L	
	Acenaphthene		0.43 µg/L	
	Benzene		8.6 µg/L	
	Pentachlorophenol	MSD high	21 µg/L	J
	Iron (dissolved)	Field Dup RPD > 30%	930 µg/L	J
MW-21-7-012722	beta-BHC	Dual column RPD > 40%	0.0061 µg/L	J

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-DUP-012722	Acenaphthylene	Elevated PQL	0.12 µg/L	UJ
	2,3,4,6-Tetrachlorophenol		1.6 µg/L	
	Fluoranthene		0.29 µg/L	
	PCB-Aroclor 1016		5.3 µg/L	
	PCB-Aroclor 1221		5.3 µg/L	
	PCB-Aroclor 1232		5.3 µg/L	
	PCB-Aroclor 1242		5.3 µg/L	
	PCB-Aroclor 1248		5.3 µg/L	
	PCB-Aroclor 1254		0.53 µg/L	
	Aldrin	Dual column RPD > 40%	2.5 µg/L	J
	Heptachlor Epoxide		0.34 µg/L	
	4,4'-DDE		0.68 µg/L	
	Dieldrin		0.26 µg/L	
	Endosulfan II		0.23 µg/L	
	4,4'-DDT		0.17 µg/L	
	Endrin Aldehyde		0.11 µg/L	
	Endosulfan Sulfate		0.13 µg/L	
	Naphthalene	Field Dup RPD > 30%	9.5 µg/L	J
	2-Methylnaphthalene		6.6 µg/L	
	1-Methylnaphthalene		5.4 µg/L	
	Acenaphthene		0.68 µg/L	
	Benzene		14 µg/L	
	Iron (dissolved)		540 µg/L	

Notes:
1. Data qualifiers are as follows:
J = The value is an estimate.
UJ = The analyte was not detected at the estimated reporting limit indicated.

Abbreviations:
µg/L = micrograms per liter
Dup = duplicate
MS/MSD = matrix spike/matrix spike duplicate
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
RPD = relative percent difference

References

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

C:\Users\kellie.mcbee\Documents\Whitmarsh GW 2110-289 and 2201-245 DV Memo kkm.docx

City of Anacortes
904 6th Street
P.O.Box 547
Anacortes, WA 98221-0547

Invoice/Permit #: BLD-2021-0986
Applied date: 12/07/2021
Issue date: 12/08/2021
Expire date: 12/03/2022

Job Address: 9663 SOUTH MARCH'S POINT RD
ANACORTES WA 98221

Permit Type: Commercial Demolition Permit
Project:

APN: P19676
P110128

Remarks: DEMO OF 5043 SF OF METAL BUILDINGS AND COVERS.

Owner: SKAGIT COUNTY
Address: 1800 CONTINENTAL PL
MOUNT VERNON WA 98273-5625
Phone: (360) 336-9400

Contractor: WELCH BROTHERS CONSTRUCTION INC.
Address: PO BOX 818
ANACORTES WA 98221-0818
Phone: (360) 293-9848
License #:

General Information:

Dwelling Units	0

Fees:

State Building Code Fee Comm	25.00
Demolition permit	60.00
Total Calculated:	85.00
Deposits/Receipts:	0.00
Total Due:	85.00

The issuance or granting of this permit shall not be construed to be a permit for, or approval of, any violation of this Code or any other ordinance or order of the City, of any state or federal law, or of any order, proclamation, guidance advice or decision of the Governor of this State. To the extent the issuance or granting of this permit is interpreted to allow construction activity during any period of time when such construction is prohibited or restricted by any state or federal law, or order, proclamation, guidance advice or decision of the Governor of this State, this permit shall not authorize such work and shall not be valid. The building official is authorized to prevent occupancy or use of a structure where in violation of this Code, any other City ordinances of this jurisdiction or any other ordinance or executive order of the City, or of any state or federal law, or of any order, proclamation, guidance advice or decision of the Governor. The building official is authorized to suspend or revoke this permit if it is determined to be issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any City ordinance, regulation or order, state or federal law, or any order, proclamation, guidance or decision of the Governor. This permit becomes null and void if work or construction authorized is not commenced within 180 days or if construction work is suspended or abandoned for a period of 180 days at any time after work is commenced. I have read and examined this application and know the same to be true and correct.

SIGNATURE OF OWNER OR AUTHORIZED AGENT

ISSUED BY

Environmental Abatement Services Inc

12/6/21

Name: Welch Brothers Construction Inc. (Michael Welch)

Asbestos Abatement Project Completed at
9663 S. March Rd Anacortes WA 98221

Per the Asbestos Survey #PS21204410 conducted by Wood Environment (Megan Dienst cert# 182235) then EAS (contractor #ENVIRAS014RA, asbestos certification #01279) removed asbestos containing materials from the above address as specified in the surveys. According to local state and federal regulations, materials containing more than one percent (1%) asbestos must be removed prior to any remodel, renovation or demolition activity.

The materials were removed by Certified Asbestos Workers under the direct supervision of a Certified Asbestos Supervisor in accordance with all applicable local, state and federal regulations. The materials collected were packaged for final disposal in compliance with all applicable federal, state and local laws.

The building surveyed, the materials found to contain more than 1% asbestos removed and properly disposed in accordance with all applicable regulations. A copy of the survey with laboratory report, and this letter, may be used as documentation of the completion of asbestos identification and removal. Any planned remodeling, renovation, or demolition activities should be approved to proceed.

All Materials were removed per survey

Sincerely,

Catherine D Marquez

CATHERINE D MARQUEZ
OWNER

PO Box 2503 / 18365 W Lincoln St.
Mount Vernon, WA 98273

Phone (360) 755-1085
Fax (360) 588-4180

northwest Clean Air agency
1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360-428-1617
fax 360-428-1620
info@nwcleanairwa.gov
www.nwcleanairwa.gov

As ..os / Demolition Notification Approval and Permit to Work

Notification #	21-568
Received Date	11/11/2021
Approval Date	11/12/2021
Fee Amount	$ 455.00
Receipt #	03463G

Project Site

commercial
9663 S. March Rd.
Anacortes, WA 98221
Onsite Supervisor Cathy Marquez
Supervisor Phone (360) 755-1085

Project Details

Project Type Asbestos removal with demolition
Building Type Non-single Family Residence
☐ **Emergency**
Asbestos Project **from** 11/24/2021 **to** 11/24/2021 **Work Schedule** Wed 7am-2pm
Estimated Demolition Date 12/01/2021
Square Feet 649 **Linear Feet**
☑ **Survey**
Survey Link [Survey on file with NWCAA]
☐ **Owner Occupied Abatement**
Asbestos Locations Storage shed on the property
☐ **Class I** ☑ **Class II** ☐ **Vermiculite** ☐ **Non-friable Fee Exempt Material**
Type of Material Scheduled for Removal
Cement board (CAB)
Control Methods Water applicator, HEPA vacuum, Other: 6mil drops and Barrier tape

Owner

Site Owner Skagit County waste
Owner Phone (360) 416-1400

Contractor

Environmental Abatement Services
P.O. Box 2503
Mt Vernon, WA 98273

Comments I will be Emailing the survey as it is to big. I also added test samples EAS took the the survey assumed to be asbestos
Notification Submitted by Cathy Marquez
Notification Contact Phone (360) 755-1085
Notification Contact Email officeeas@comcast.net

This notification must be posted at the work site.

You must file an amendment if there are any changes to the project scope or schedule.
<http://nwcleanairwa.gov/forms/asbestos-project-amendment/>
Information on asbestos and demolition can be found on the agency website.
<http://nwcleanairwa.gov/permits-and-services/asbestos-and-demolition/>
Asbestos disposal information
<http://nwcleanairwa.gov/download/disposal-information/>
NWCAA asbestos regulations can be found in Section 570 Asbestos Control Standards.
<http://nwcleanairwa.gov/regulation/section-550-590/section-570/>

Generated: 11/12/2021 11:13 AM

PLANNING, COMMUNITY, & ECONOMIC DEVELOPMENT DEPARTMENT
Mailing Address: P.O. Box 547, Anacortes, WA 98221
Office Location: 904 6th Street, Anacortes WA 98821
Phone: (360) 293-1901

Deconstruction & Demolition Permits

Submittal Packet

A demolition permit is required for deconstruction/demolition of structures and decommissioning of underground storage tanks. A demolition permit is required for partial demolitions of structures when the proposed work is not otherwise covered by a building permit.

SUBMITTAL CHECKLIST

Applicant Checklist	***Deconstruction / Demolition Permit*** ***Submittal Requirement Checklist***	Structure Type: Residential	Commercial	Underground tank	For office use:
	Deconstruction/Demolition Permit Application Form (attached)	x	x	x	
✓	Site Plan • A to-scale site plan identifying the property lines, easements, footprint of all existing structures, labeled as proposed to be demolished or retained, and all utilities that serve structures to be demolished, including: potable water, sanitary and storm sewers, electric service, natural gas, and propane (as applicable). • Include proposed stormwater Best Management Practices to be employed during site work for erosion control and provisions for long term stabilization of the site.	x	x	x	
✓	Documentation of approval by Northwest Clear Air Agency Unless deemed exempt by the NWCAA, all city required demo permits also require a permit from NWCAA. Go to http://nwcleanairwa.gov for more information.	x	x		
✓	Asbestos Survey and Remediation Report, if required by NWCAA Prepared by a Washington State Certified Asbestos Abatement Contractor.	x	x		
✓	Pedestrian Safety Plan		x		
	City of Anacortes Fire Department Special Purpose Permit for Tank Removal			x	
✓	Photographs of the building (if it is 50 or more years old) • Please include photos of all sides of the building's exterior architecture, and unique interior details. • Submit digitally by email to pced@cityofanacortes.org, on a thumb drive, or printed paper copies with your permit application.	x	x		
	SEPA checklist (***Only required** for structures with recognized historic significance or not exempted under WAC 197-11-800(2)(g)). Check with PCED, 360-299-1984, for assistance.	*	*		
	Required Number of Copies and Plan Size **1** paper copy of each item above Plans must be **min**imum 8 ½" x 11", to scale, and legible.	**Application Fee** See the Land Use Permit Fee Schedule			

PLANNING, COMMUNITY, & ECONOMIC DEVELOPMENT DEPARTMENT
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BUILDING MATERIALS SALVAGE OPTIONS

Did you know that salvaging usable materials from your project can save money, conserve valuable material and energy resources, and help preserve Anacortes history?

Instead of demolishing and taking materials to the landfill, please consider relocation, salvage, or deconstruction. Here are several resources you may wish to consult while planning your project:

- The City of Anacortes Museum / Historic Preservation board can provide advice for researching the property's history, suggest potential alternatives to demolition, and identify historically significant architectural features of the structure that may be ideal for salvage during structure removal. Please contact the Anacortes Museum at 360-293-1915 or coa.museum@cityofanacortes.org for assistance.
- Contact your Habitat for Humanity Store at 360-428-9402 (https://www.habitat.org/restores/donate-goods) and they may remove or transport usable building materials from your project and give you a tax credit in exchange.
- Some private companies may offer full deconstruction services to remove an entire building.

  A helpful resource is the Construction Recycling Toolkit published by Sustainable Connections available on their website: https://sustainableconnections.org/programs/toward-zero-waste/

GENERAL PROCESS OUTLINE

- Notify the Northwest Clean Air Agency in writing and obtain needed permits: https://nwcleanairwa.gov/permits-and-services/asbestos-and-demolition/.
- Call 811 (Call Before You Dig) to notify utility companies with potential facilities in the area of your dig site. They will send a locater to identify these facilities.
- Gather needed information and submit a deconstruction / demolition permit application to the City of Anacortes.
- After permit issuance, install erosion control Best Management Practices per plan.
- Ensure City water service is shut off.
- Cap side sewer per Anacortes Engineering Design Standards and call for an inspection (360-299-1972).
- Notify other non-City utility service purveyors (gas, electricity, cable, etc.) to determine requirements for service interruption or disconnection.
- Septic tanks must be pumped and abandoned per Skagit County Health Department requirements.
- Any fuel tanks (above or underground) must be removed / decommissioned in accordance with State regulations. Contact Anacortes Fire Department for a permit and inspection (360-293-1925).
- Dispose of building and construction materials in an approved manner.
- Stabilize the site to prevent stormwater/erosion impacts to surrounding properties and streets.

PLANNING, COMMUNITY, & ECONOMIC DEVELOPMENT DEPARTMENT
Mailing Address: P.O. Box 547, Anacortes, WA 98221
Office Location: 904 6th Street, Anacortes WA 98821
Phone: (360) 293-1901

DECONSTRUCTION/DEMOLITION PERMIT APPLICATION

1. PROPERTY INFORMATION

Project Address (Street, Suite #):	**Assessor Parcel Number:**
9663 S MARCH POINT ROAD ANACORTES WA. 98221	P19676

2. TYPE OF STRUCTURE

☐ Single Family ☐ Multifamily, # of Dwelling Units _____ ☑ Commercial / Industrial

☐ Duplex ☐ Other Use Type: _____ ☐ Underground Fuel Tank

3. STRUCTURE INFORMATION

FOR BUILDINGS:

Description of Work: removal of metal bldg and covers	**Size of structure:** 3780 **sq. ft.**
Method of Disposal: remain onsite	**Date of original construction of structure:** 1999

Historic Resources Information:

Is the structure listed on the City of Anacortes Local, State, or National register of historic places? ☐ YES* ☑ NO Designation:_____ *If yes, SEPA review is required prior to issuing a demolition permit. **Note:** Check with the City of Anacortes Museum and/or the WA State Dept. of Archaeological and Historic Preservation's WISSARD system to answer this question.	If identified prior to demolition, are you willing to salvage from the structure historically significant architectural features? ☐ YES ☐ NO NA

Utility & services disconnection / interruption information

Identify which City services you would like to disconnect / stop:

Water	☑ Disconnect ☐ Retain	Storm	☑ Disconnect ☐ Retain
Sewer	☑ Disconnect ☐ Retain	Garbage	☑ Discontinue Retain

For private utilities (gas, electricity, cable, etc.), you will need to contact the applicable companies if their services are to be interrupted or disconnected.

FOR UNDERGROUND STORAGE TANKS:

Decommissioning type: NA

☐ Abandonment in place (Fire Dept. Approval required) Date of pump & rinse: _____ Type of inert fill:_____	☐ Removal Disposal Location: _____

Approximate age of tank: _____ **ICC Certification #:** _____

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Mailing Address: P.O. Box 547, Anacortes, WA 98221
Office Location: 904 6th Street, Anacortes WA 98821
Phone: (360) 293-1901

4. PROPERTY OWNER INFORMATION

Name: skagit county soild waste division attn. Margo Gallaspy	Phone: 360-416-1578
Address (Street, City, State, Zip): 1800 Continental pl. Mt. Vernon Wa. 98273	Email Address: margog@co.skagit.wa.us

5. CONTRACTOR INFORMATION

Name:* Welch Brothers Construction	Phone: 360-333-3040	
Contractor's Business Licenses **All Contractors & Subcontractors must have a valid City of Anacortes business license prior to doing work in the City.*	State License #: WELCHBC995RC Expiration Date: 9/20/2022	City of Anacortes Endorsement? ☑ YES ☐ NO
Address (Street, City, State, Zip):	Email Address: mike@welchbros.com	

6. FINANCING INFORMATION (Required if project valuation exceeds $5,000, per RCW 19.27.095)

Lender administering the construction financing or firm issuance a payment bond (if any) on behalf of the prime contractor for the protection of the owner, if the bond is for an amount not less than 50% of the total amount of the construction project (if owner is self-financing, please indicate).
* Completion of this information may be deferred until permit issuance.

Name: NA	Phone:
Address (Street, City, State, Zip):	

7. CONTACT PERSON

Select one person the city will contact for anything related to this project:	☐ Property Owner ☒ Contractor ☐ Other (list below)
Name: Michael Welch	Phone: 3603333040
Address (Street, City, State, Zip): Welch Brothers const. inc. po box 818 anacortes wa. 98221	Email Address: mike@welchbros.com

8. SIGNATURE

I hereby declare that I am either the owner of the property listed on this application or the owner of this property has authorized me to be their representative to act for them. I also declare under penalty of perjury under the laws of the State of Washington that all of the statements and answers contained herein, and the information submitted with this application form is in all respects, true, correct, and complete to the best of knowledge and belief.

Signature _____ Date 12/2/21

Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

for

Demolition of Structures at Whitmarsh Landfill

Anacortes, Washington

Version 1

Prepared for:

Department of Ecology Northwest Region

Permittee/Owner	**Contractor**	**Owner**
Skagit County Solid Waste Division 1800 Continental Place Mt. Vernon, WA 98273 PERMIT No. NOI		Skagit County 1800 Continental Place Mt. Vernon, WA 98273

Project Location:

9663 S. Marsh Point Road

Anacortes, WA 98221

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number

Project Construction Dates

Activity/Phase	Start Date	End Date
Demolition	November 2021	December 2021

Document Revisions Record

Version	Organization	Prepared by	Date
1.0	Wood Environment & Infrastructure Solutions, Inc.	Koorus Tahghighi	October 18, 2021

Contents

Project Information 1
Existing Conditions 1
Proposed Construction Activities 2
Construction Stormwater Best Management Practices (BMPs) 4
The 13 Elements 4
Element 1: Preserve Vegetation/Mark Clearing Limits 4
Element 2: Establish Construction Access 4
Element 3: Control Flow Rates 4
Element 4: Install Sediment Controls 5
Element 5: Stabilize Soils 6
Element 6: Protect Slopes 6
Element 7: Protect Drain Inlets 7
Element 8: Stabilize Channels and Outlets 7
Element 9: Control Pollutants 7
Element 10: Control Dewatering 9
Element 11: Maintain BMPs 9
Element 12: Manage the Project 9
Element 13: Protect Low Impact Development (LID) BMPs 10
Pollution Prevention Team 10
Monitoring and Sampling Requirements 11
Site Inspections 11
Stormwater Quality Sampling 11
Reporting and Record Keeping 11
Record Keeping 11
Site Logbook 11
Records Retention 12
Updating the SWPPP 12
Reporting 12
Discharge Monitoring Reports 12
Notification of Noncompliance 12

List of Figures

See Appendix A

List of Tables

Table 1—Pollutants....7
Table 2—pH-Modifying Sources....8
Table 3—Management BMPs....10
Table 4—BMP Implementation Schedule....10
Table 5—Team Information....11

List of Appendices

A. Project Drawings
B. Analytical Data Tables
C. BMPs
D. Site Inspection Form

List of Acronyms and Abbreviations

Acronym/Abbreviation	Explanation
µg/L	micrograms per liter
303(d)	Section 303(d) of the Clean Water Act pertaining to impaired waterbodies
BMP(s)	best management practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CSWGP	Construction Stormwater General Permit
CUL	cleanup level
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
ESC	erosion and sediment control
MTCA	Model Toxics Control Act
NPDES	National Pollutant Discharge Elimination System
pH	power of hydrogen
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMDL	Total Maximum Daily Load

Project Information

Project/Site Name:	Demolition of Structures at Whitmarsh Landfill				
Street/Location:	9663 S. March Point Road				
City:	Mt. Vernon	State:	WA	Zip code:	98221
Subdivision:	None				
Receiving waterbody:	Padilla Bay				

Existing Conditions

Total acreage:

The total limit of work is approximately 4.5 acres.

Disturbed acreage:

The total area of demolition activity is about 1.2 acre, which will not have any soil exposed.

Existing structures:

There are three sheds and one former office building, all constructed by lumber and corrugated metal roofing.

Landscape topography:

The project area is generally flat, with a general slope from east to west and maximum localized slopes of about 3 percent. A swale traverses the west and south boundaries, with side-slopes of 33 percent.

Existing drainage patterns:

Currently, the Property is a landfill with clean cover soil on the surface (Figure 1). The stormwater primarily infiltrates. Any stormwater runoff will be either east directly into Padilla Bay, north to a ditch along existing railroad tracks, then east to Padilla Bay, or south to the swale separating the landfill from S. March Point Road, which in turn drains into Padilla Bay (Figure 2). The project figures are included in **Appendix A**.

Existing vegetation:

The site contains native trees and shrubs (e.g., red alder, Sitka willow, salmonberry) and invasive species (e.g., Himalayan blackberry, reed canary grass) (ICF, 2016).

Critical areas (wetlands, streams, high erosion risk, steep or difficult to stabile slopes):

There are no wetlands on top of the landfill, but the there is a continuous wetland in the swale and extending into Padilla Bay (shoreline).

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody:

There is no TMDL for Padilla Bay. The outer lagoon is listed as Category 5 for sediment PCBs and Category 2 for pH and dissolved oxygen in water.

List all known or suspected contaminants associated with the site in Table 1, including contaminants previously remediated:

There is no known surface contamination. Subsurface soil and groundwater investigations conducted on the property indicate the presence of metals, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), benzene, semi volatile organic compounds (SVOCs), and pesticides in exceedance of the cleanup levels. For the project purposes, the entire subsurface soil below the clean cover soil and the groundwater are assumed to be contaminated. Summary tables of the analytical data and concentrations are presented in Appendix B.

Proposed Construction Activities

Description of site development:

The project includes removal of regulated substances (e.g., asbestos) from the structures and demolition of three wooden sheds and a wooden office building. The concrete surfaces on site will be broken up in place to allow stormwater infiltration.

In the future, the entire site (~15 acres) will be regraded, capped with imported clean soil and low permeability liner material, and hydroseeded. However, none of those activities will occur during the current proposed activities. This project will not come into contact with contaminated materials. No excavation is proposed at this time. If a need arises, the Ecology's project manager, Arianne Fernandez, and the regional inspector, Elizabeth Fint, will be notified and work on the project will cease. All subsurface soil is considered contaminated, any excavated material beneath the clean cover soil will be placed on plastic sheeting and covered, and placed back in the excavation and covered with the clean cover soil.

Description of construction activities:

Construction activities include:

- Site preparation: installing temporary erosion control measures and constructing crushed rock construction entrances. Work areas will be marked, and silt fences will be installed on the downgradient side of the project.
- Containment berms will be installed on the downgradient of the work area to capture the stormwater runoff, if any, and redirecting it to areas where it will infiltrate.
- Removal and offsite disposal or recycling of regulated material, e.g., asbestos.
- Demolition of the wooden structures to the floor slab and recycling the metals.

- The wooden debris will be stockpiled on site to be incorporated into the landfill during the future site regrading and capping project.
- Concrete slabs will be broken up in place, but not moved, for future regrading.

Description of site drainage, including flow from and onto adjacent properties (must be consistent with Site Map in Appendix A):

Most of the stormwater infiltrates on site. The entire site stormwater runoff, if any, flows either directly to the east into Padilla Bay, north to a ditch along existing railroad tracks, then east into Padilla Bay, or indirectly flows to the south into a stormwater swale separating the site from S. March Point Road, which ultimately drains into Padilla Bay. The total drainage basin is approximately 15 acres (**Figure 2-Appendix A**).

Description of final stabilization:

No surface disturbance causing erodible soil exposure is expected. Any surfaces where the soil might have been disturbed will be covered with site vegetation, and if large enough, seeded.

Contaminated site information:

Contamination in subsurface soil and groundwater is present on site. However, no subsurface activity or surface soil disturbance is proposed. This project is not anticipated to come into contact with contaminated material. The known subsurface contamination and concentrations presented in the Cleanup Action Plan are presented in **Appendix B**.

Construction Stormwater Best Management Practices (BMPs)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e., hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

The 13 Elements

BMPs will be implemented prior to the initiation of the project. BMPs are included in **Appendix C** (BMP Details) as a quick reference tool for the on-site inspector in the event the BMPs listed for the elements below are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (CSWGP).

To avoid potential erosion and sediment control issues that may cause a violation(s) of the CSWGP, the Certified Erosion and Sediment Control Lead (CESCL) will promptly initiate the implementation of one or more alternative BMPs listed in **Appendix C** after the first initial sign that existing BMPs are ineffective or failing.

Element 1: Preserve Vegetation/Mark Clearing Limits

To protect adjacent areas and to maintain the smallest footprint during construction, the project limits will be clearly marked at the initiation of the project. The site has been mowed; all other vegetation will be protected. Filter fabric fencing will be installed along the swale. The BMPs that will be used include:

- Preserving Natural Vegetation (BMP C101 from Ecology's *Stormwater Management Manual for Western Management* [SWMMWW])
- Silt Fence (BMP C233 [SWMMWW])

Element 2: Establish Construction Access

Construction access point is the gate at S. March Point Road, and it will be stabilized with crushed rock (e.g., quarry spalls) to minimize the risk of tracking onto public roads. Site roads have been stabilized; however, additional rock will be placed in areas where the construction traffic may expose site soil. Any tire wash wastewater will be controlled on site.

The specific BMP related to establishing construction access that could be used on this project is:

- Stabilized Construction Entrance (BMP C105 [SWMMWW])

A stabilized construction entrance will be constructed as shown on the Temporary Erosion and Sediment Control (TESC) Plans (**Appendix A**), or as approved.

Element 3: Control Flow Rates

Will you construct stormwater retention and/or detention facilities?

☐ Yes ☒ No

Will you use permanent infiltration ponds or other low impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?

☐ Yes ☒ No

Containment berms will be constructed downgradient of the work areas. Any stormwater that ponds behind the berm will be pumped to a depression to infiltrate. Filter fabric or other energy-dissipating elements will be placed at the discharge location to prevent soil erosion during discharge.

The specific BMPs related to controlling flow rates that will be used on this project may include:

- Outlet Protection (BMP C209 [SWMMWW])
- Straw Wattles (BMP C235 [SWMMWW])
- Water Bars (BMP C203 [SWMMWW])

Element 4: Install Sediment Controls

Any stormwater accumulation during the work will be infiltrated on site. There are no catch basins on site or on the street. The utility pipes will be capped at the buildings to prevent any discharges via subsurface pipes. The site has been mowed and the vegetation remains on site, which will filter suspended sediment from any flowing stormwater.

Specific BMPs that will be used for controlling sediment on this project include:

- Straw Wattles (BMP C235 [SWMMWW]), if needed
- Silt Fence (BMP C233 [SWMMWW])

Other BMPs that could be used for controlling sediment on this project include:

- Gravel Filter Berm (BMP C232 [SWMMWW])
- Vegetated Strip (BMP C234 [SWMMWW])
- Sediment Trap (BMP C240 [SWMMWW])
- Construction Stormwater Filtration (BMP C251 [SWMMWW])
- Portable Water Storage Tanks (e.g., Baker Tank)
- Materials on Hand (BMP C150 [SWMMWW]) may also be applicable

Sediment control BMPs will be constructed as shown on the TESC Plans (see **Appendix A**). BMPs will be installed prior to the start of activities. Damaged control measures will be repaired when they are observed. Removal of sediment will occur from silt fence and storm drain inlet protection if sediment reaches 30 percent of the height of the BMP. Removed sediment will be stockpiled on site and stabilized with vegetation and seeded It should be noted that silt fence and containment berms are present on site since the last field construction activity in 2014 and have not accumulated any sediment since.

Element 5: Stabilize Soils

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1–October 30	7 days
During the Wet Season	November 1–April 30	2 days

While not expected, soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast. Any contaminated soil stockpile will be covered daily.

Anticipated project dates: **Start date:** November 2021 **End date:** December 2021

Will you construct during the wet season?

☐ Yes ☒ No – No earth-disturbing activities are planned.

The specific BMPs for soil stabilization that could be used on this project include:

- Topsoiling (BMP C125 [SWMMWW])

Other BMPs for soil stabilization that could be used on this project include:

- Temporary and Permanent Seeding (BMP C120 [SWMMWW])
- Sodding (BMP C124 [SWMMWW])
- Materials on Hand (BMP C150 [SWMMWW]) may also be applicable
- Nets and Blankets (BMP C122 [SWMMWW])
- Plastic Covering (BMP C123 [SWMMWW])
- Dust Control (BMP C140 [SWMMWW])
- Mulching (BMP C121 [SWMMWW])

Soil stabilization BMPs, in addition to re-vegetation, will be installed if needed. Plastic covering will be used, as necessary, to protect stockpiles. In general, stockpiled soils will be stabilized from erosion, protected with sediment trapping measures and, where possible, be located away from drainage channels.

Temporary mulching (e.g., straw) or plastic covering will be used to stabilize exposed soils and protect against erosion, as necessary. All soil stabilization BMPs will be installed as soon as practicable after soil disturbance.

Element 6: Protect Slopes

Will steep slopes be present at the site during construction?

☐ Yes ☒ No - Steep slopes are not present in the work area.

Element 7: Protect Drain Inlets

All on site storm drain inlets and culverts within the work areas will be capped. However, if any drainage feature needs to remain operational, inlet protection BMPs will be installed (BMP C220 [SWMMWW]), **Appendix B**).

BMPs will be inspected and maintained frequently, especially after storm events. Catch basin filters will be cleaned or replaced if sediment has filled the device by one third, or as specified by the manufacturer. Sediment, debris, trash, and all other material collected will be stockpiled onsite ad stabilized by vegetation or covered with plastic sheeting.

Element 8: Stabilize Channels and Outlets

The construction will not impact channels and outlets and no BMPs are required for stabilization of stream banks or slopes or at outlets.

Element 9: Control Pollutants

Table 1 provides the anticipated pollutants likely in the project area during construction.

Table 1—Pollutants

Pollutant	Source
Petroleum and other chemical products	Equipment Vehicles Refueling

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

☒ Yes ☐ No – Only in designated area.

Will wheel wash or tire bath system BMPs be used during construction?

☐ Yes ☒ No – Wheel wash will be utilized if needed. The primary method of preventing sediment tracking will be by not allowing haul trucks to travel over exposed soil.

Will pH-modifying sources be present on-site?

☐ Yes ☒ No Existing concrete slabs will be broken up in place to facilitate stormwater infiltration, but not moved or processed on site.

Table 2—pH-Modifying Sources

☒	None
☐	Bulk cement
☐	Cement kiln dust
☐	Fly ash
☐	Other cementitious materials
☐	New concrete washing or curing waters
☐	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults
☐	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Recycled concrete stockpiles
☐	Other (i.e., calcium lignosulfate) [please describe:]

Will uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters?

☐ Yes ☐ No - Not applicable

Vehicles, Construction Equipment, and/or Petroleum Product Storage/Dispensing:

All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills and to identify maintenance needs to prevent leaks or spills. Spill prevention measures, such as drip pans and absorbent pads, will be used when conducting maintenance and repair of vehicles or equipment.

To perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle. A sufficient quantity of stocked spill response kits will be available on-site, including smaller portable spill kits carried within equipment and construction vehicles.

In addition, the following steps are required:

- Contain and clean up spills immediately
- Clean spills and contaminated surfaces immediately following any discharge or spill incident, using dry cleanup measures
- Eliminate the source of the spill to prevent a discharge

Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean and well-organized.

The following measures are required to provide best management practices for waste management:
Sanitary wastewater: Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.

Solid waste: Solid waste will be stored in secure, clearly marked containers.

Wheel wash wastewater: The use of a Wheel Wash (BMP C106) on-site is not anticipated, but if installed, wastewater will be discharged offsite at a permitted facility, or stored on site in drums for later characterization and disposal.

Spill Prevention Control and Countermeasures Plan: A separate Spill Prevention, Control, and Countermeasures Plan will be developed by the contractor.

Element 10: Control Dewatering

Not applicable.

Element 11: Maintain BMPs

All temporary and permanent Erosion and Sediment Control (ESC) BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair shall be conducted in accordance with each particular BMP specification (see Volume II of the *Stormwater Management Manual for Western Washington*).

Visual monitoring of all BMPs installed at the site will be conducted by the contractor at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs may be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be stabilized on-site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Vegetation will be used to permanently stabilize the work areas, if needed. The vegetation growth and health will be monitored to ensure long-term stabilization.

Element 12: Manage the Project

The project will be managed based on the following principles:

- Project is of short duration and will be scheduled for a period of low precipitation.
- Inspection and monitoring:
    - Inspection, maintenance, and repair of all BMPs will occur as needed to ensure performance of their intended function.
    - Site inspections and monitoring are required in accordance with Special Condition S4 of the CSWGP.
- Maintain an updated SWPPP:
    - The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP.

As site work progresses, the SWPPP will be modified if needed to reflect changing site conditions. The SWPPP will be reviewed to ensure the content is current.

Management BMPs that apply to the site are shown in **Table 3.**

The BMP implementation schedule is provided in **Table 4**.

Table 3—Management BMPs

The following Management BMPs will be employed:

☒	Design the project to fit the existing topography, soils, and drainage patterns
☒	Emphasize erosion control rather than sediment control
☒	Minimize the extent and duration of the area exposed
☒	Keep runoff velocities low
☒	Retain sediment on-site
☒	Thoroughly monitor site and maintain all ESC measures
☒	Schedule major earthwork during the dry season
	Other (please describe): Leave paved surfaces intact

Table 4—BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
Prior to construction	Clearing Limit BMPs	Estimated November 2021	Wet
	Stabilized Construction Entrance		
	Delineate Construction Staging and Parking Areas		
	Control Flow Rate BMPs		
	Sediment Controls BMPs		
	Protect Storm Drain Inlets		
	Manage Materials		
During/After construction or as needed	Stabilize Soils BMPs	Estimated December 2021	Wet
	Protect Slopes BMPs		
	Manage Construction Materials		
	Repair/modification/replacement of BMPs as needed		
	Install additional BMPs as needed		

Element 13: Protect Low Impact Development (LID) BMPs

Not applicable.

Pollution Prevention Team

The pollution prevention team listed in **Table 5** is responsible for implementation of the SWPPP.

Table 5—Team Information

Title	Name(s)	Phone Number
Project Manager	Koorus Tahghighi	206-641-6301
Monitoring Personnel		
Emergency Permittee/Owner Contact	Margo Gillaspy	360-770-4213
Non-Emergency Permittee/Owner Contacts	Margo Gillaspy	360-416-1578
Ecology Regional Office	Elizabeth Fint	360-296-0274
Emergency Ecology Contact		

Monitoring and Sampling Requirements

Monitoring includes visual inspection, sampling for water quality parameters of concern where needed, and documentation of the inspection and sampling findings in a site logbook. A site logbook will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements.
- A record of site inspections.
- Stormwater sampling data, where needed.

A Construction Stormwater Site Inspection Form is filed under **Appendix D**.

The site logbook must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Site Inspections

Site inspections will be conducted at least once every calendar week. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

Stormwater Quality Sampling

There are no requirements for stormwater sampling as all stormwater from work areas will be infiltrated.

Reporting and Record Keeping

Record Keeping

Site Logbook

A site logbook will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements.
- Site inspections.

Records Retention

Records will be retained during the life of the project and for a minimum of three (3) years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site includes the following:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site logbook

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing in accordance with Special Condition S5.G.2.b of the CSWGP.

Updating the SWPPP

This SWPPP will be modified if:

- Found ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site.
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State.

The SWPPP will be modified within seven (7) days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

Reporting

Discharge Monitoring Reports

No stormwater discharge is anticipated. However, if needed, Discharge Monitoring Reports will be submitted to Ecology, per requirements of the CSWGP permit.

Notification of Noncompliance

If any of the terms and conditions of the permit are not met, and the resulting noncompliance may cause a threat to human health or the environment, and the following actions will be taken:

1. Ecology will be notified within 24 hours of the failure to comply by calling the Northwest Regional Office's Environmental Report Tracking System at 206-594-0000.
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately, and the results submitted to Ecology within five (5) days of becoming aware of the violation.

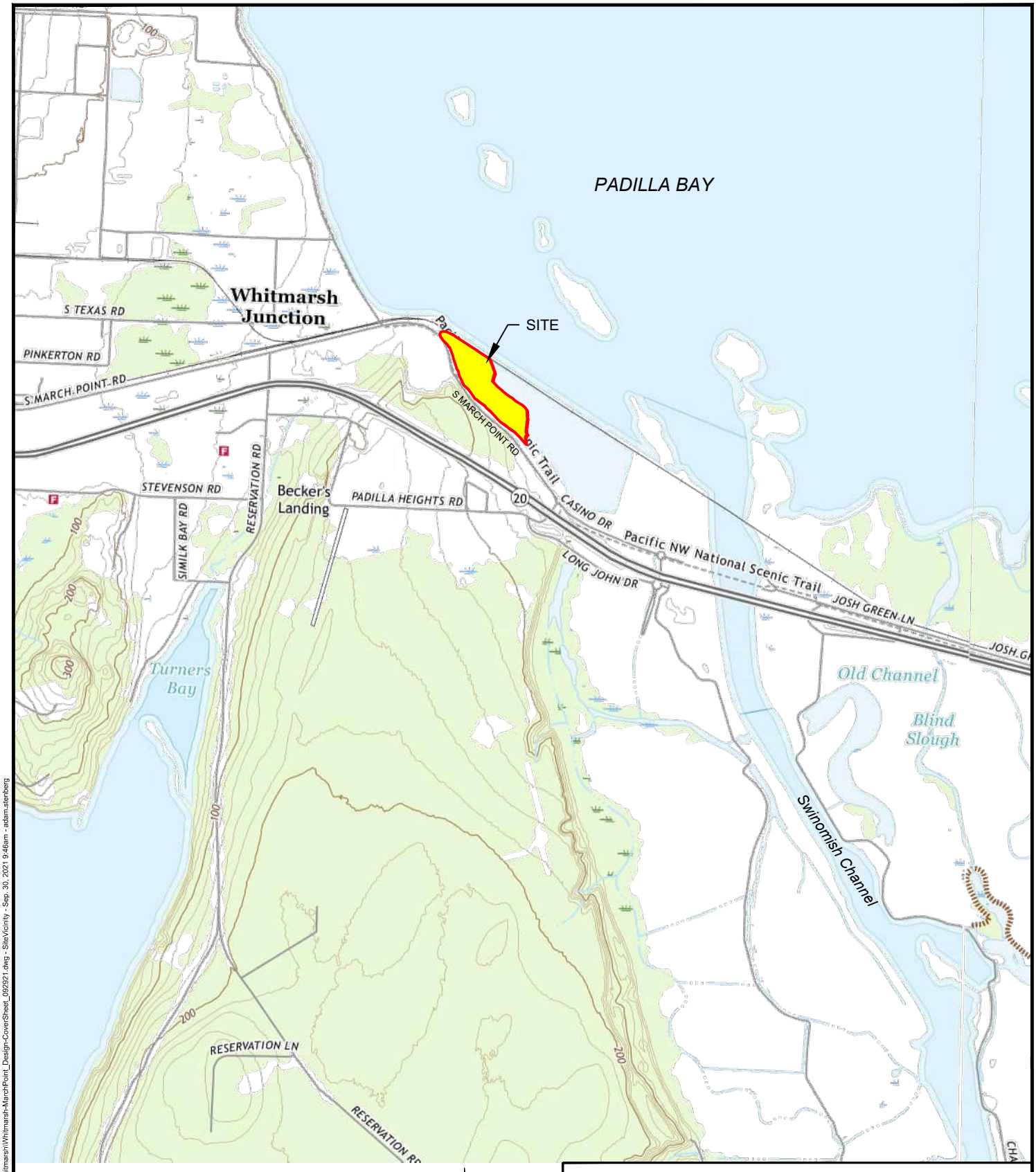
3. A detailed written report describing the noncompliance will be submitted to Ecology's Northwest Regional Office at nwroerts@ecy.wa.gov.

Include the following information:

1. Your name and phone number
2. Permit number
3. City/County of project
4. Sample results
5. Date/Time of call
6. Date/Time of sample
7. Project name

Appendix A

Project Drawings



N

0 1,000 2,000

APPROXIMATE SCALE IN FEET

SITE VICINITY
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 09/30/21	Project No. PS21204410
wood.		Figure 1

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PADILLA BAY

BNSF RAILROAD

PHOTO 1

PHOTO 2

EXISTING ROADWAY

GATE

EXISTING CULVERT

PHOTO 3

PADILLA BAY
INNER LAGOON

APPROXIMATE EXTENT
OF SOLID WASTE

FORMER OUTFALL

APPROXIMATE EXTENT OF SOLID WASTE

EXISTING CULVERT

EXISTING CULVERT

S MARCH POINT RD



PHOTO 2



PHOTO 1



PHOTO 3

EXPLANATION

- PARCEL LINE
- STORMWATER SWALE
- APPROXIMATE EXTENT OF SOLID WASTE (15.7 ACRES)
- 25 — ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- SURFACE FLOW ARROW
- APPROXIMATE DRAINAGE BASIN DIVIDE

0 75 150
APPROXIMATE SCALE IN FEET

DRAINAGE
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 10/19/21	Project No. PS21204410
wood.		Figure 2

Plot Date: 10/19/21 - 9:36am, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_100521.dwg

PADILLA BAY

BNSF RAILROAD

APPROXIMATE EXTENT OF SOLID WASTE

MHT (EL. 10.27')

PADILLA BAY
INNER LAGOON

EXISTING ROADWAY

EXISTING ROADWAY

GATE

EXISTING CULVERT

FORMER OUTFALL

EXISTING OR NEW SILT FENCE

APPROXIMATE EXTENT OF SOLID WASTE

EXISTING CULVERT

EXISTING CULVERT

S MARCH POINT RD

MHT (EL. 10.27')

EXPLANATION

- LIMIT OF WORK (4.53 ACRES)
- PARCEL LINE
- MEAN HIGH TIDE AVERAGE (EL. 10.27')
- STORMWATER SWALE
- APPROXIMATE EXTENT OF SOLID WASTE (15.7 ACRES)
- 25 — ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- SURFACE FLOW ARROW
- SILT FENCE
- CONTAINMENT BERM
- STORMWATER INFILTRATION AREA
- CONSTRUCTION ENTRANCE

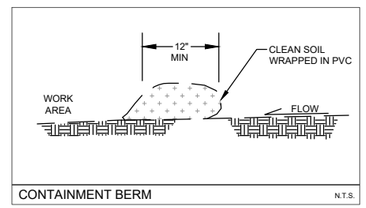
UTILITY LEGEND

- SS — SEWER DRAIN
- RD — ROOF DRAIN
- W — WATER LINE
- FIRE LINE
- P — POWER LINE

NOTES:

1. CAP ALL UTILITIES AND DRAINS AT THE GATE AND AT THE STRUCTURES.
2. PREVENT STORMWATER FROM LEAVING THE SITE.

0 75 150
APPROXIMATE SCALE IN FEET



CONTAINMENT BERM N.T.S.

TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC)
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 10/18/21	Project No. PS21204410
wood.		Figure 3

Plot Date: 10/18/21 - 3:06pm Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design_100521.dwg

Appendix B

Analytical Data Tables

TABLE 2

SUMMARY OF PCL EXCEEDANCES
FOR MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER/NOVEMBER 2008 AND MARCH/APRIL 2010 [1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte [3]	Sample ID / Depth (feet bgs) / Sample Date	PCL	MW-01 11.5 10/7/2008	MW-01 20.5 10/7/2008	MW-01 37 10/7/2008	MW-03 11.5 10/9/2008	MW-04 8.5 10/8/2008	MW-04 19 10/8/2008	MW-08 26-27.5 4/2/2010	MW-10 24.5-26 4/1/2010	G1 1 11/1/2008	G1 5.5 11/1/2008	G3 1 10/31/2008	G3 8 10/31/2008	G3 12 10/31/2008	G4 1 10/31/2008	G4 5 10/31/2008	G5 1 11/2/2008	G5 5 11/2/2008	G5 9 11/2/2008
Metals (mg/kg)																				
Antimony		5.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic		7	--	--	--	--	14 J	--	--	11	--	--	--	--	8.8	--	--	--	--	--
Barium		102	--	--	239	117	--	--	NA	NA	--	115	--	--	--	--	259	--	--	--
Cadmium		1.0	--	--	--	--	--	--	1.3	--	--	2.6	--	--	--	--	2.7	--	--	--
Copper		36	--	--	61	373	44.6	--	60.2	--	--	76	--	76.0	--	--	49.3	--	--	36.4
Lead		118	--	--	--	171	--	--	--	--	--	--	--	--	--	--	238	--	--	--
Mercury		0.07	--	--	--	--	--	--	--	--	--	6.9	--	0.10	0.08	--	0.08	--	--	0.26
Nickel		48	99	81	56	80	83	60	55 J	--	76	90	63	60	--	76	75	62	65	62
Zinc		101	--	--	--	282	--	--	245	--	--	381	--	174	--	--	311	187	225	187
TPH (mg/kg)																				
Gasoline-Range Organics (TPH-G)		30/100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	310 J
Lube Oil (TPH-Oil)		2,000	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
VOCs (µg/kg)																				
Benzene		6.8	--	--	--	--	--	--	--	--	--	--	--	--	11	--	--	--	--	--
SVOCs (µg/kg)																				
2,4-Dimethylphenol		3,100	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene		70	NA	NA	NA	NA	NA	NA	--	--	--	270	--	--	--	--	--	--	--	130
Benzo(a)pyrene		190	NA	NA	NA	NA	NA	NA	--	--	--	240	--	--	--	--	--	--	--	120
Dibenzofuran		90	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Phenol		46,000	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylphenol		190	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl) phthalate		2,600	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	6,000
Chrysene		80	NA	NA	NA	NA	NA	NA	--	--	--	320	--	--	--	--	--	--	--	180
PCBs (µg/kg)																				
Aroclor 1254		4	NA	NA	NA	27	NA	NA	--	--	--	--	--	22	--	--	240	--	--	110 J
Pesticides (µg/kg)																				
4,4'-DDD		3.3	NA	NA	NA	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE		3.3	NA	NA	NA	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Aldrin		1.7	NA	NA	NA	--	NA	NA	--	--	--	--	--	--	--	--	--	--	--	390
delta-BHC		1.7	NA	NA	NA	--	NA	NA	--	--	--	--	9.8	120	1.6 U	--	--	--	--	--
Dieldrin		3.3	NA	NA	NA	--	NA	NA	--	--	--	--	--	24	--	--	--	--	--	210

TABLE 2

SUMMARY OF PCL EXCEEDANCES
FOR MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER/NOVEMBER 2008 AND MARCH/APRIL 2010 [1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte [3] / Sample ID / Depth (feet bgs) / Sample Date	PCL	G6	G6 field dup.	G10	G11	G17.5	G29	G30	G30 DRUM [4]	G32	G35	G37
		6		8	11	7	9	7		12	15	10
		11/1/2008		11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
Metals (mg/kg)												
Antimony	5.1	--	11 J	--	--	--	--	--	--	--	--	--
Arsenic	7	--	--	--	13	8	--	--	--	--	70	--
Barium	102	--	--	--	--	NA	NA	NA	NA	NA	NA	NA
Cadmium	1.0	--	--	--	--	--	--	--	--	--	--	--
Copper	36	50.0	70.8	--	--	--	--	--	--	261	57.5	--
Lead	118	--	--	--	--	--	--	--	--	--	184	--
Mercury	0.07	--	--	--	--	--	--	--	--	0.13	0.34	--
Nickel	48	69	69	67	--	55 J	78 J	211 J	190 J	179 J	495 J	361 J
Zinc	101	175	345	--	--	--	--	--	133	413	149	--
TPH (mg/kg)												
Gasoline-Range Organics (TPH-G)	30/100	--	--	--	--	--	--	--	--	350	90	--
Lube Oil (TPH-Oil)	2,000	--	--	--	--	--	3,400	--	--	--	--	--
VOCs (µg/kg)												
Benzene	6.8	--	--	--	--	--	--	--	NA	11	--	--
SVOCs (µg/kg)												
2,4-Dimethylphenol	3,100	--	--	--	--	--	--	--	--	--	130,000	--
Benzo(a)anthracene	70	--	--	--	--	--	--	--	--	100 J	--	--
Benzo(a)pyrene	190	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	90	--	--	--	--	--	--	--	--	240	--	--
Phenol	46,000	--	--	--	--	--	--	--	--	73,000	--	--
2-Methylphenol	190	--	--	--	--	--	--	--	--	--	130,000	--
bis(2-Ethylhexyl) phthalate	2,600	--	--	--	--	--	--	--	--	--	--	--
Chrysene	80	--	--	--	--	--	1,100 J	--	--	190	--	--
PCBs (µg/kg)												
Aroclor 1254	4	76	31	--	--	--	--	--	--	42	--	--
Pesticides (µg/kg)												
4,4'-DDD	3.3	--	--	--	--	--	4.4	--	--	--	--	--
4,4'-DDE	3.3	--	--	--	--	--	--	--	--	--	620	--
Aldrin	1.7	--	--	--	--	--	--	--	--	--	--	--
delta-BHC	1.7	2.8	3.1	--	--	--	--	--	--	--	--	--
Dieldrin	3.3	--	--	--	--	--	--	--	--	--	--	--

Notes
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = Reported value is an estimate.
2. Sample IDs beginning with "G" are test pits; sample IDs beginning with "MW" are monitoring wells.
3. Analyte not shown if detected concentration did not exceed PCL in any soil sample.
4. Material sample found in a drum in the test pit.

Abbreviations
-- = Analyte does not exceed the applicable PCL
µg/kg = micrograms per kilogram
bgs = below ground surface
dup = duplicate
mg/kg = milligrams per kilogram
NA = not analyzed
PCBs = polychlorinated biphenyls
PCL = preliminary cleanup level
SVOCs = semivolatile organic compounds
TPH-D = total petroleum hydrocarbons as diesel
TPH-G = total petroleum hydrocarbons as gasoline
VOCs = volatile organic compounds

TABLE 3

SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte / Sample ID / Sample Date	PCL	MW-02							MW-03						
		10/14/2008	12/18/2008	4/29/2009	7/24/2009	4/13/2010	7/13/2010	10/5/2010	10/14/2008	12/18/2008	4/28/2009	7/23/2009	4/13/2010	7/13/2010	10/5/2010
Dissolved Metals (µg/L)															
Arsenic	0.2	1.9	2.2	2.3 J-	2.5	2.3	2.9	2.7	4.1	0.5	0.5 J-	4.1	2.5	3.5	4.3
Copper	2.4	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Iron	1,000	--	--	--	--	NA	NA	NA	11,800	--	--	13,400	NA	NA	NA
Lead	2.5	--	--	--	--	3	--	--	--	--	--	--	--	--	--
Manganese	50	--	--	--	--	NA	NA	NA	332	227	276 J-	319	NA	NA	NA
Selenium	5	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Silver	1.9	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Total Metals (µg/L)															
Aluminum	87	--	--	--	--	NA	NA	NA	460 J	--	--	--	NA	NA	NA
Arsenic	0.2	2	2.2	2.3	2.8	4.8	2.9	2.5	4.9	2.7	2.8	4.1	2.5	3.5	4.1
Copper	2.4	--	--	--	--	NA	NA	NA	3	--	--	--	NA	NA	NA
Iron	1,000	--	--	--	--	NA	NA	NA	13,400	12,200	14,600	12,500	NA	NA	NA
Lead	2.5	--	--	--	--	2	--	--	16 J	--	--	--	--	--	--
Manganese	50	--	--	--	64	NA	NA	NA	350	254	301	307	NA	NA	NA
Mercury	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	1.9	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
PCBs (µg/L)															
Aroclor 1232	0.014	--	--	--	--	--	--	--	--	0.029 J	0.019	--	--	--	--
Aroclor 1242	0.014	--	--	--	--	--	--	--	0.03	--	--	--	--	--	--
Aroclor 1248	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/L)															
4,4'-DDD	0.00125	--	--	--	--	--	--	--	--	0.0056 J	0.0058	0.0075	0.0072	0.0074	--
4,4'-DDE	0.00125	--	--	--	--	--	--	--	--	--	--	--	--	--	--
alpha-BHC	0.0006	--	--	--	--	--	--	--	0.015	0.031 J	0.041	0.016	0.026	0.034	0.027
SVOCs (µg/L)															
1-Methylnaphthalene	1.51	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
2,4-Dimethylphenol	380	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Benzo(a)anthracene	0.01	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
bis(2-ethylhexyl)phthtlate	1.2	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Chrysene	0.01	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
VOCs (µg/L)		--	--	--	--										
Benzene	1.2	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA

TABLE 3

SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte / Sample ID / Sample Date	PCL	MW-03 Field Duplicate				MW-04							MW-05				
		10/14/2008	12/18/2008	4/28/2009	7/23/2009	10/14/2008	12/19/2008	4/29/2009	7/24/2009	4/13/2010	7/13/2010	10/5/2010	4/14/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013
Dissolved Metals (µg/L)																	
Arsenic	0.2	4	0.4	0.5 J-	4.1	4.6	4.4	5.5 J-	5.9	5.6	6.1	6.4	2.5	2.2	2.3	1.4	1.6
Copper	2.4	--	--	--	--	--	--	--	--	NA	NA	NA	3	4	--	--	--
Iron	1,000	12,000	--	1,360 J-	13,600	--	--	--	--	NA	NA	NA	4,510	6,980	8,450	20,000	15,500
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	336	226	284 J-	327	127	121	124 J-	125	NA	NA	NA	294	573	487	664	511
Selenium	5	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	50	--	--
Silver	1.9	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	--	--
Total Metals (µg/L)																	
Aluminum	87	--	--	--	--	160	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.2	4.4	2.8	2.7	4	4.1	4.8	5.6	5.6	5.8	6.1	6.3	1.7	3	2.2	1.4	1.8
Copper	2.4	--	--	--	--	--	--	--	--	NA	NA	NA	5	5	--	--	--
Iron	1,000	12,400	12,300	13,300	12,900	--	--	--	--	NA	NA	NA	4,820	6,020	8,440	20,100	9,590
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	349	258	282	316	136	129	124	127	NA	NA	NA	309	570	484	665	341
Mercury	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	28.6	--	--
Silver	1.9	--	--	--	--	--	--	--	--	NA	NA	NA	7	--	--	--	--
PCBs (µg/L)																	
Aroclor 1232	0.014	--	0.031 J	0.022	--	--	--	--	--	--	--	--	--	--	--	NA	NA
Aroclor 1242	0.014	0.031	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA
Aroclor 1248	0.014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA
Total PCBs	0.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA
Pesticides (µg/L)																	
4,4'-DDD	0.00125	--	0.0061 J	0.0061	0.0082	--	--	--	--	--	--	--	--	--	--	NA	NA
4,4'-DDE	0.00125	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA
alpha-BHC	0.0006	0.015	0.036 J	0.039	0.018	--	--	--	--	--	--	--	--	--	--	NA	NA
SVOCs (µg/L)																	
1-Methylnaphthalene	1.51	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA
2,4-Dimethylphenol	380	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA
Benzo(a)anthracene	0.01	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA
bis(2-ethylhexyl)phthtlate	1.2	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA
Chrysene	0.01	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA
VOCs (µg/L)																	
Benzene	1.2	--	--	--	--	--	--	--	--	NA	NA	NA	--	--	--	NA	NA

TABLE 3

SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte / Sample ID / Sample Date	PCL	MW-06					MW-07					MW-08			MW-09				
		4/15/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/6/2010	3/26/2013	8/17/2013	4/14/2010	7/13/2010	10/7/2010	4/14/2010	7/13/2010	10/7/2010	3/26/2013	8/17/2013
Dissolved Metals (µg/L)																			
Arsenic	0.2	0.7	0.7	0.8	1.2	0.9	--	--	--	--	0.9	2.2	1.8	1.6	1.2	1.4	1.4	1.7	1.5
Copper	2.4	--	--	--	--	--	5	6	--	--	--	--	--	--	--	--	--	--	--
Iron	1,000	98,400	102,000	97,700	77,900	92,200	4,520	3,940	2,370	5,820	1,540	34,300	36,600	46,600	19,000	22,400	21,300	22,700	24,500
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	2,730	2,670	2,220	2,310	2,300	579	372	217	673	183	1,680	1,660	2,390	449	543	447	529	565
Selenium	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Metals (µg/L)																			
Aluminum	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.2	1	1.2	0.7	1.2	1.0	--	0.9	--	--	1	2.2	1.7	1.8	1.4	1.3	1.4	1.8	1.4
Copper	2.4	--	--	--	--	--	9	5	--	--	4	3	--	--	3	3	--	--	--
Iron	1,000	101,000	102,000	95,700	74,600	91,400	4,590	3,650	2,710	5,720	1,590	38,800	37,300	42,900	19,600	22,800	19,400	23,100	24,000
Lead	2.5	--	--	--	--	--	--	--	--	--	--	3	--	--	3	--	--	--	--
Manganese	50	2,720	2,690	2,270	2,240	2,340	581	356	234	672	185	1,990	1,790	2,140	464	548	411	555	551
Mercury	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCBs (µg/L)																			
Aroclor 1232	0.014	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
Aroclor 1242	0.014	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
Aroclor 1248	0.014	0.017	--	--	NA	NA	--	--	--	NA	NA	0.015	--	--	--	--	--	NA	NA
Total PCBs	0.07	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
Pesticides (µg/L)																			
4,4'-DDD	0.00125	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
4,4'-DDE	0.00125	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
alpha-BHC	0.0006	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
SVOCs (µg/L)																			
1-Methylnaphthalene	1.51	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
2,4-Dimethylphenol	380	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
Benzo(a)anthracene	0.01	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA
bis(2-ethylhexyl)phthtlate	1.2	--	--	1.3	NA	NA	--	--	--	NA	NA	--	--	--	--	--	2.4	NA	NA
Chrysene	0.01	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	0.014	0.015	0.011	NA	NA
VOCs (µg/L)																			
Benzene	1.2	--	--	--	NA	NA	--	--	--	NA	NA	--	--	--	--	--	--	NA	NA

TABLE 3

SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte / Sample ID / Sample Date	PCL	MW-09 Field Dup.	MW-10			MW-11			MW-11 Field Duplicate			SP-01						
		3/26/2013	4/15/2010	7/13/2010	10/7/2010	4/15/2010	7/14/2010	10/8/2010	4/15/2010	7/14/2010	10/8/2010	10/15/2008	12/17/2008	4/28/2009	7/24/2009	4/14/2010	7/15/2010	10/7/2010
Dissolved Metals (µg/L)																		
Arsenic	0.2	1.7	2.8	2.8	3	1.8	1.4	1.9	1.8	1.4	2	0.4	--	0.4 J-	1.2	0.4	1.2	1.2
Copper	2.4	--	--	3	--	--	--	--	--	3	--	--	--	--	--	NA	NA	NA
Iron	1,000	22,900	11,300	13,800	13,900	10,600	11,100	13,000	10,800	11,100	12,200	--	--	--	12,300	NA	NA	NA
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	531	210	200	200	320	271	294	326	272	279	154	233	225 J-	173	NA	NA	NA
Selenium	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Silver	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Total Metals (µg/L)																		
Aluminum	87	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	--	150	--	--	NA	NA	NA
Arsenic	0.2	1.7	2.7	2.7	3	1.8	1.4	1.9	1.9	1.4	1.9	1.4	1.4	1.3	1.3	1.4	1.3	1.3
Copper	2.4	--	3	--	--	--	3	--	--	3	--	--	--	--	--	NA	NA	NA
Iron	1,000	22,800	11,300	13,100	14,100	10,800	9,930	12,500	10,800	10,800	12,100	15,900	22,100	15,500	12,100	NA	NA	NA
Lead	2.5	--	3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	546	210	190	202	323	240	287	324	264	284	173	251	238	163	NA	NA	NA
Mercury	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
PCBs (µg/L)																		
Aroclor 1232	0.014	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1242	0.014	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	0.014	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total PCBs	0.07	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pesticides (µg/L)																		
4,4'-DDD	0.00125	NA	--	0.0058 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	0.00125	NA	0.16	0.058 J	--	--	0.34 J	--	--	0.32 J	--	--	--	--	--	--	0.082 J	--
alpha-BHC	0.0006	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SVOCs (µg/L)																		
1-Methylnaphthalene	1.51	NA	--	--	--	2.8	2.8	3.1	2.7	2.8	2.6	--	--	--	--	NA	NA	NA
2,4-Dimethylphenol	380	NA	--	--	--	640	--	--	650	--	--	--	--	--	--	NA	NA	NA
Benzo(a)anthracene	0.01	NA	--	--	--	--	--	--	--	0.012 J	--	--	--	--	--	NA	NA	NA
bis(2-ethylhexyl)phthtlate	1.2	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Chrysene	0.01	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
VOCs (µg/L)																		
Benzene	1.2	NA	--	--	2.7	8.3	3.7	6.4	8.6	3.9	5.9	2.6	2.4	1.9	2.2	NA	NA	NA

TABLE 3

SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1]

March Point (Whitmarsh) Landfill
Skagit County, Washington

Analyte / Sample ID / Sample Date	PCL	SP-02 10/15/2008	SP-02 12/18/2008	SP-02 4/28/2009	SP-02 7/24/2009	SP-02 4/15/2010	SP-02 7/15/2010	SP-02 10/7/2010	SP-03 10/15/2008	SP-03 12/18/2008	SP-03 4/28/2009	SP-03 7/24/2009	SP-03 4/15/2010	SP-03 7/15/2010	SP-03 10/7/2010
Dissolved Metals (µg/L)															
Arsenic	0.2	--	--	0.7 J-	1.1	--	1.3	12	0.8	--	0.6 J-	0.8	--	--	0.8
Copper	2.4	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Iron	1,000	--	--	--	18,200	NA	NA	NA	--	--	3,940 J-	25,800	NA	NA	NA
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	50	126	364	332 J-	321	NA	NA	NA	434	477	545 J-	444	NA	NA	NA
Selenium	5	--	--	--	--	NA	NA	NA	--	--	--	50	NA	NA	NA
Silver	1.9	11	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Total Metals (µg/L)															
Aluminum	87	270	2,230	680	900	NA	NA	NA	580	--	--	--	NA	NA	NA
Arsenic	0.2	--	1.4	1.7	2.4	0.6	0.5	0.9	1.3	--	1.1	0.8	0.9	1.5	2.2
Copper	2.4	--	5	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
Iron	1,000	5,890	21,400	25,100	26,400	NA	NA	NA	55,300	19,800	41,100	25,400	NA	NA	NA
Lead	2.5	--	--	--	--	--	--	--	--	--	--	--	NA	NA	--
Manganese	50	85	409	373	314	NA	NA	NA	557	495	570	395	NA	NA	NA
Mercury	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Silver	1.9	8	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA
PCBs (µg/L)															
Aroclor 1232	0.014	--	--	0.028	--	--	--	--	--	0.086 J	0.091	--	--	--	--
Aroclor 1242	0.014	--	--	--	--	--	--	--	0.035 J	0.029 J	--	--	--	--	--
Aroclor 1248	0.014	--	--	--	--	--	--	--	--	--	--	--	0.017 J	--	--
Total PCBs	0.07	--	--	--	--	--	--	--	0.035 J	0.115	0.091	--	0.017 J	--	--
Pesticides (µg/L)															
4,4'-DDD	0.00125	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4,4'-DDE	0.00125	--	--	--	--	--	--	--	--	--	--	--	--	--	--
alpha-BHC	0.0006	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SVOCs (µg/L)															
1-Methylnaphthalene	1.51	--	--	--	--	NA	NA	NA	4	5.2	5.3	3.6	NA	NA	NA
2,4-Dimethylphenol	380	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Benzo(a)anthracene	0.01	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
bis(2-ethylhexyl)phthtlate	1.2	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
Chrysene	0.01	--	--	--	--	--	--	--	--	--	--	--	NA	NA	NA
VOCs (µg/L)															
Benzene	1.2	--	--	--	--	NA	NA	NA	--	--	--	--	NA	NA	NA

Notes
1. Data qualifiers are as follows:
   J = analyte was positively identified; result is an estimated concentration.
   J- = value is esitmated with a possible low bias

Abbreviations
-- = does not exceed the PCL
µg/L = micrograms per liter
NA = Not analyzed
PCBs = polychlorinated biphenyls
PCL = preliminary cleanup level
SVOCs = semivolatile organic compounds
VOCs = volatile organic compounds

Appendix C

BMP Details

Construction Stormwater Best Management Practices (BMPs) To Be Implemented

BMP C101: Preserving Natural Vegetation

Purpose

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

Conditions of Use

Natural vegetation should be preserved on steep slopes, near perennial and intermittent water-courses or swales, and on building sites in wooded areas.

- As required by local governments.
- Phase construction to preserve natural vegetation on the project site for as long as possible during the construction period.

Design and Installation Specifications

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.

- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can typically tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

  When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:
    - Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint if roots will be exposed for more than 24-hours.
    - Backfill the trench as soon as possible.
    - Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madrona is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock, Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

Maintenance Standards

Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored. If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or lop- pers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

BMP C105: Stabilized Construction Access

Purpose

Stabilized construction accesses are established to reduce the amount of sediment transported onto paved roads outside the project site by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for project sites.

Conditions of Use

Construction accesses shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential subdivision construction sites, provide a stabilized construction access for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size and configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized accesses not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

See Figure II-3.1: Stabilized Construction Access for details. Note: the 100' minimum length of the access shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction accesses with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction access stabilization because these products raise pH levels in stormwater and concrete discharge to waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the standards listed in Table II-3.2: Stabilized Construction Access Geotextile Standards.

Table II-3.2: Stabilized Construction Access Geotextile Standards

Geotextile Property	Required Value
Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will be paved; this can be used as a stabilized access. Also consider the installation of excess concrete as a stabilized access. During large concrete pours, excess concrete is often available for this purpose.
- Fencing (see BMP C103: High-Visibility Fence) shall be installed as necessary to restrict traffic to the construction access.

- Whenever possible, the access shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction accesses should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction access must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

Alternative Material Specification

WSDOT has raised safety concerns about the Quarry Spall rock specified above. WSDOT observes that the 4-inch to 8-inch rock sizes can become trapped between Dually truck tires, and then released off-site at highway speeds. WSDOT has chosen to use a modified specification for the rock while continuously verifying that the Stabilized Construction Access remains effective. To remain effective, the BMP must prevent sediment from migrating off site. To date, there has been no performance testing to verify operation of this new specification. Jurisdictions may use the alternative specification, but must perform increased off-site inspection if they use, or allow others to use, it.

Stabilized Construction Accesses may use material that meets the requirements of WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction* Section 9-03.9(1) (WSDOT, 2016) for ballast except for the following special requirements.

The grading and quality requirements are listed in Table II-3.3: Stabilized Construction Access Alternative Material Requirements.

Table II-3.3: Stabilized Construction Access Alternative Material Requirements

Sieve Size	Percent Passing
2½″	99-100
2″	65-100
¾″	40-80
No. 4	5 max.
No. 100	0-2
% Fracture	75 min.

- All percentages are by weight.
- The sand equivalent value and dust ratio requirements do not apply.
- The fracture requirement shall be at least one fractured face and will apply the combined aggregate retained on the No. 4 sieve in accordance with FOP for AASHTO T 335.

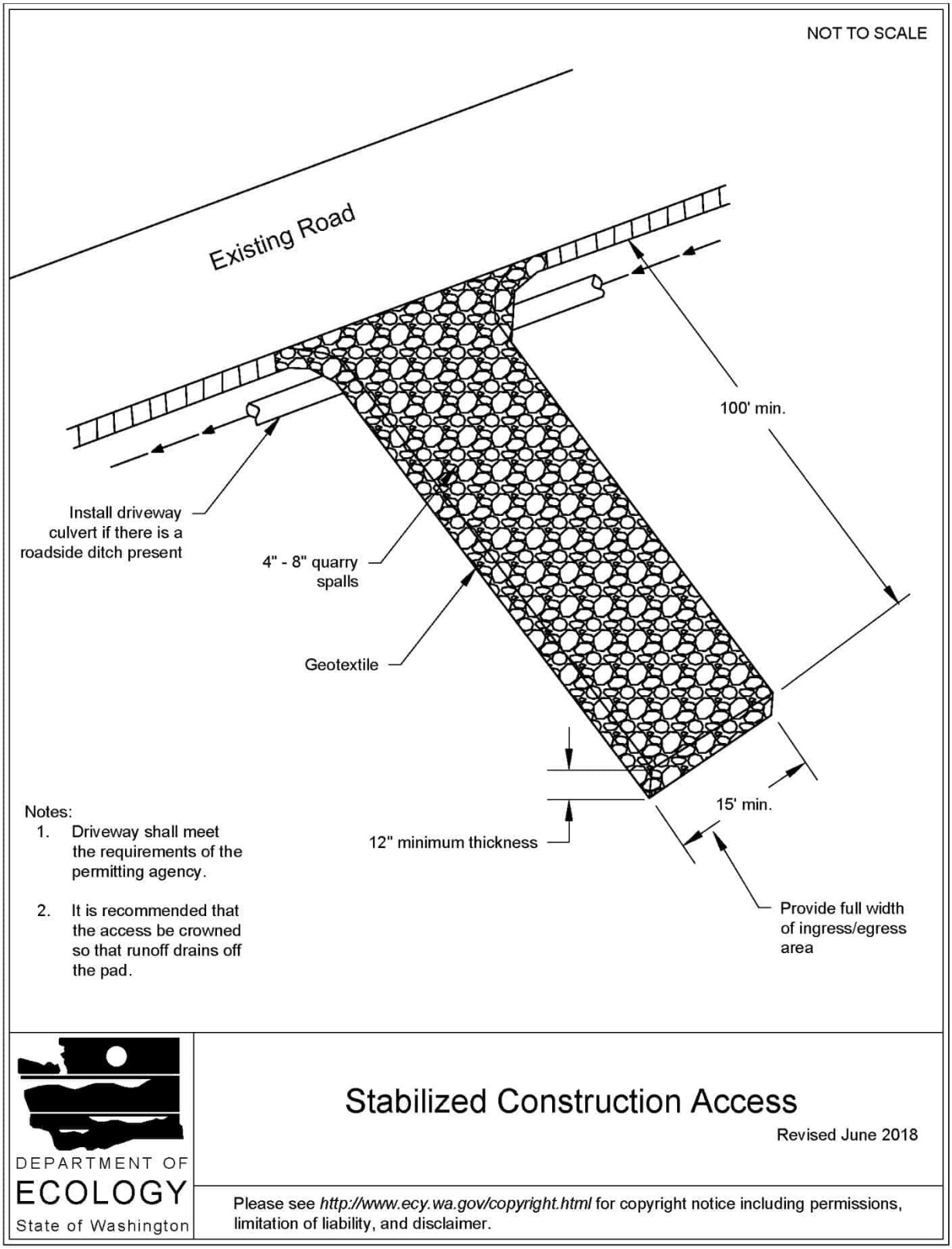
Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the access is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the access, or the installation of BMP C106: Wheel Wash.

- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction access(es), BMP C103: High-Visibility Fence shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Figure II-3.1: Stabilized Construction Access



Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching for specifications.

Seed and mulch all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion. See BMP T5.13: Post-Construction Soil Quality and Depth.

Design and Installation Specifications

General

- Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over the top of hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed

before water flow; install sod in the channel bottom — over top of hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 per- cent tackifier. See BMP C121: Mulching for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application. See BMP T5.13: Post-Construction Soil Quality and Depth.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:
    - Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
    - Phase 2- Install the rest of the mulch and tackifier over the first lift.

  Or, enhance vegetation by:

    - Installing the mulch, seed, fertilizer, and tackifier in one lift.
    - Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
    - Hold straw in place with a standard tackifier.

  Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

    - Irrigation.
    - Reapplication of mulch.
    - Repair of failed slope surfaces.

  This technique works with standard hydromulch (1,500 pounds per acre minimum) and Bonded Fiber Matrix/ Mechanically Bonded Fiber Matrix (BFM/MBFMs) (3,000 pounds per acre minimum).

- Seed may be installed by hand if:
    - Temporary and covered by straw, mulch, or topsoil.
    - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.

- The seed mixes listed in Table II-3.4: Temporary and Permanent Seed Mixes include recommended mixes for both temporary and permanent seeding.
- Apply these mixes, with the exception of the wet area seed mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Apply the wet area seed mix at a rate of 60 pounds per acre.
- Consult the local suppliers or the local conservation district for their recommendations. The appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used, depending on the soil type and hydrology of the area.

Table II-3.4: Temporary and Permanent Seed Mixes

Common Name	Latin Name	% Weight	% Purity	% Germination
Temporary Erosion Control Seed Mix A standard mix for areas requiring a temporary vegetative cover.				
Chewings or annual blue grass	*Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye	*Lolium perenne*	50	98	90
Redtop or colonial bentgrass	*Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover	*Trifolium repens*	5	98	90
Landscaping Seed Mix A recommended mix for landscaping seed.				
Perennial rye blend	*Lolium perenne*	70	98	90
Chewings and red fescue blend	*Festuca rubra var. commutata* or *Festuca rubra*	30	98	90
Low-Growing Turf Seed Mix A turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.				
Dwarf tall fescue (several varieties)	*Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay)	*Lolium perenne var. barclay*	30	98	90
Red fescue	*Festuca rubra*	20	98	90
Colonial bentgrass	*Agrostis tenuis*	5	98	90
Bioswale Seed Mix A seed mix for bioswales and other intermittently wet areas.				
Tall or meadow fescue	*Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	92	85
Redtop bentgrass	*Agrostis alba* or *Agrostis gigantea*	5-10	90	80

Table II-3.4: Temporary and Permanent Seed Mixes (continued)

Common Name	Latin Name	% Weight	% Purity	% Germination
Wet Area Seed Mix A low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.				
Tall or meadow fescue	*Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	98	85
Meadow foxtail	*Alepocurus pratensis*	10-15	90	80
Alsike clover	*Trifolium hybridum*	1-6	98	90
Redtop bentgrass	*Agrostis alba*	1-6	92	85
Meadow Seed Mix A recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seed- ing should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.				
Redtop or Oregon bentgrass	*Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue	*Festuca rubra*	70	98	90
White dutch clover	*Trifolium repens*	10	98	90

Roughening and Rototilling

- The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.
- Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.

Fertilizers

- Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.

- Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
- In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
- There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.

Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix

- On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils. Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.
- Install products per manufacturer's instructions.
- BFMs and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
    - BFM and MBFMs do not require surface preparation.
    - Helicopters can assist in installing BFM and MBFMs in remote areas.
    - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
    - Installing BFM and MBFMs can save at least $1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 75 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, nets, or blankets.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes run- off.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There are a variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief. Mulch may be applied at any time of the year and must be refreshed periodically.

For seeded areas, mulch may be made up of 100 percent:

- cottonseed meal;
- fibers made of wood, recycled cellulose, hemp, or kenaf;
- compost;
- or blends of these.

Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as poly-acrylamide or polymers.

Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

Recycled cellulose may contain polychlorinated biphenyl (PCBs). Ecology recommends that products should be evaluated for PCBs prior to use.

Refer to BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body.

Any mulch or tackifier product used shall be installed per the manufacturer's instructions.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table II-3.6: Mulch Standards and Guidelines. Consult with the local supplier or the local conservation district for their recommendations. Increase the application rate until the ground is 95% covered (i.e. not visible under the mulch layer). Note: Thickness may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Where the option of "Compost" is selected, it should be a coarse compost that meets the size gradations listed in Table II-3.5: Size Gradations of Compost as Mulch Material when tested in accordance with Test Method 02.02-B found in *Test Methods for the Examination of Composting and Compost* (Thompson, 2001).

Table II-3.5: Size Gradations of Compost as Mulch Material

Sieve Size	Percent Passing
3"	100%
1"	90% - 100%
3/4"	70% - 100%
1/4"	40% - 100%

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material. Consult the Hydraulic Permit Authority (HPA) for mulch mixes if applicable.

Maintenance Standards

The thickness of the mulch cover must be maintained.

Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table II-3.6: Mulch Standards and Guidelines

Mulch Material	Guideline	Description
Straw	**Quality Standards**	Air-dried; free from undesirable seed and coarse material.
	Application Rates	2"-3" thick; 5 bales per 1,000 sf or 2-3 tons per acre
	Remarks	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
	Quality Standards	No growth inhibiting factors.
	Application Rates	Approx. 35-45 lbs per 1,000 sf or 1,500 - 2,000 lbs per acre

Hydromulch	**Remarks**	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about 3/4 - 1 inch clog hydromulch equipment. Fibers should be kept to less than 3/4 inch.
Compost	**Quality Standards**	No visible water or dust during handling. Must be produced per WAC 173-350, Solid Waste Handling Standards, but may have up to 35% biosolids.
	Application Rates	2" thick min.; approx. 100 tons per acre (approx. 750 lbs per cubic yard)
	Remarks	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Compost used for mulch has a coarser size gradation than compost used for BMP C125: Topsoiling / Composting or BMP T5.13: Post-Construction Soil Quality and Depth. It is more stable and practical to use in wet areas and during rainy weather conditions. Do not use near wetlands or near phosphorous impaired water
Chipped Site Vegetation	**Quality Standards**	Gradations from fines to 6 inches in length for texture, variation, and inter-locking properties. Include a mix of various sizes so that the average size is between 2- and 4- inches.
	Application Rates	2" thick min.;
	Remarks	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of sur- face waters. If permanent seeding or planting is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment. Note: thick application of this material over existing grass, herbaceous species, and some groundcovers could smother and kill vegetation.
Wood- Based Mulch	**Quality Standards**	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.
	Application Rates	2" thick min.; approx. 100 tons per acre (approx. 750 lbs. per cubic yard)
	Remarks	This material is often called "wood straw" or "hog fuel". The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).
	Quality Standards	A blend of loose, long, thin wood pieces derived from native conifer or deciduous trees with high length-to-width ratio.
	Application Rates	2" thick min.

Wood Strand Mulch	**Remarks**	Cost-effective protection when applied with adequate thickness. A minimum of 95-percent of the wood strand shall have lengths between 2 and 10-inches, with a width and thickness between 1/16 and 1/2-inches. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood shavings shall not be used as mulch. [Specification 9-14.4(4) from the *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT, 2016)

BMP C122: Nets and Blankets

Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows.

Nets (commonly called matting) are strands of material woven into an open, but high-tensile strength net (for example, coconut fiber matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control netting and blankets shall be made of natural plant fibers unaltered by synthetic materials.

Erosion control nets and blankets should be used:

- To aid permanent vegetated stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
- For drainage ditches and swales (highly recommended). The application of appropriate net-ting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Nets and blankets can be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap.

Disadvantages of nets and blankets include:

- Surface preparation is required.
- On slopes steeper than 2.5H:1V, net and blanket installers may need to be roped and harnessed for safety.
- They cost at least $4,000-6,000 per acre installed. Advantages of nets and blankets include:
- Installation without mobilizing special equipment.
- Installation by anyone with minimal training
- Installation in stages or phases as the project progresses.
- Installers can hand place seed and fertilizer as they progress down the slope.
- Installation in any weather.
- There are numerous types of nets and blankets that can be designed with various parameters in mind. Those parameters include: fiber blend, mesh strength, longevity, biodegradability, cost, and availability.

An alternative to nets and blankets in some limited conditions is BMP C202: Riprap Channel Lining. Ensure that BMP C202: Riprap Channel Lining is appropriate before using it as a substitute for nets and blankets.

Design and Installation Specifications

- See Figure II-3.3: Channel Installation (Clackamas County et al., 2008) and Figure II-3.4: Slope Installation for typical orientation and installation of nets and blankets used in channels and as slope protection. Note: these are typical only; all nets and blankets must be installed per manufacturer's installation instructions.
- Installation is critical to the effectiveness of these products. If good ground contact is not achieved, runoff can concentrate under the product, resulting in significant erosion.
- Installation of nets and blankets on slopes.

    1. Complete final grade and track walk up and down the slope.
    2. Install hydromulch with seed and fertilizer.
    3. Dig a small trench, approximately 12 inches wide by 6 inches deep along the top of the slope.
    4. Install the leading edge of the net/blanket into the small trench and staple approximately every 18 inches. NOTE: Staples are metal, "U"-shaped, and a minimum of 6 inches long. Longer staples are used in sandy soils. Biodegradable stakes are also available.
    5. Roll the net/blanket slowly down the slope as the installer walks backward. NOTE: The net/blanket rests against the installer's legs. Staples are installed as the net/blanket is unrolled. It is critical that the proper staple pattern is used for the net/blanket being installed. The net/blanket is not to be allowed to roll down the slope on its own as this stretches the net/blanket, making it impossible to maintain soil contact. In addition, no one is allowed to walk on the net/blanket after it is in place.
    6. If the net/blanket is not long enough to cover the entire slope length, the trailing edge of the upper net/blanket should overlap the leading edge of the lower net/blanket and be stapled. On steeper slopes, this overlap should be installed in a small trench, stapled, and covered with soil.

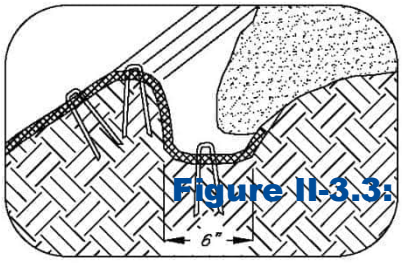
- With the variety of products available, it is impossible to cover all the details of appropriate use and installation. Therefore, it is critical that the designer consult the manufacturer's information and that a site visit takes place in order to ensure that the product specified is appropriate. Information is also available in WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction* Division 8-01 and Division 9-14 (WSDOT, 2016).
- Use jute matting in conjunction with mulch (BMP C121: Mulching). Excelsior, woven straw blankets and coir (coconut fiber) blankets may be installed without mulch. There are many other types of erosion control nets and blankets on the market that may be appropriate in certain circumstances.
- In general, most nets (e.g., jute matting) require mulch in order to prevent erosion because they have a fairly open structure. Blankets typically do not require mulch because they usually provide complete protection of the surface.
- Extremely steep, unstable, wet, or rocky slopes are often appropriate candidates for use of synthetic blankets, as are riverbanks, beaches and other high-energy environments. If synthetic blankets are used, the soil should be hydromulched first.

- 100-percent biodegradable blankets are available for use in sensitive areas. These organic blankets are usually held together with a paper or fiber mesh and stitching which may last up to a year.
- Most netting used with blankets is photodegradable, meaning it breaks down under sunlight (not UV stabilized). However, this process can take months or years even under bright sun. Once vegetation is established, sunlight does not reach the mesh. It is not uncommon to find non-degraded netting still in place several years after installation. This can be a problem if maintenance requires the use of mowers or ditch cleaning equipment. In addition, birds and small animals can become trapped in the netting.

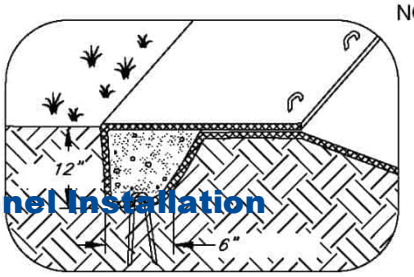
Maintenance Standards

- Maintain good contact with the ground. Erosion must not occur beneath the net or blanket.
- Repair and staple any areas of the net or blanket that are damaged or not in close contact with the ground.
- Fix and protect eroded areas if erosion occurs due to poorly controlled drainage.

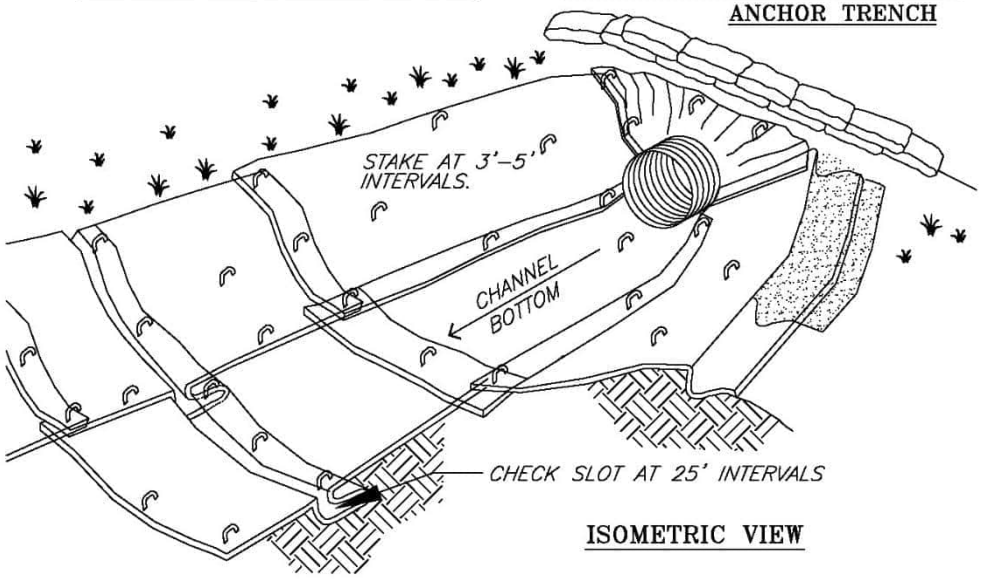
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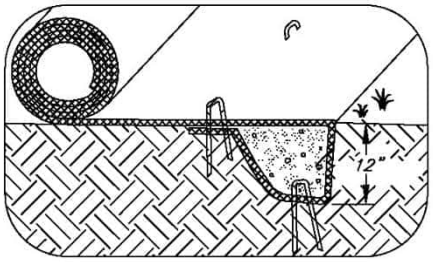
LONGITUDINAL ANCHOR TRENCH



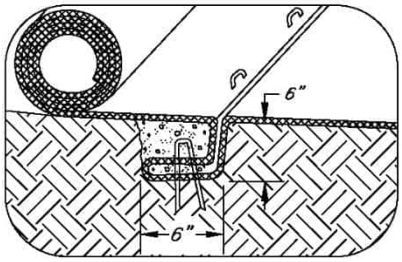
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH



INTERMITTENT CHECK SLOT

Notes:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.

(Clackamas County et al., 2008)

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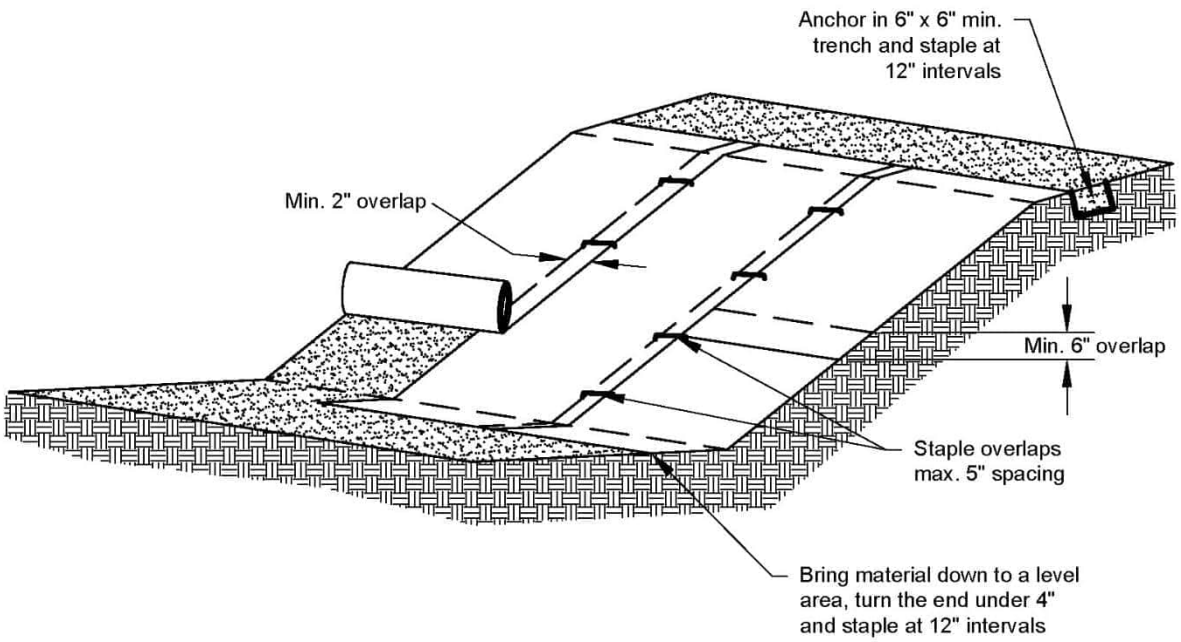
Channel Installation

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Figure II-3.3: Channel Installation

Figure II-3.4: Slope Installation



Notes:

1. Slope surface shall be smooth before placement for proper soil contact.
2. Stapling pattern as per manufacturer's recommendations.
3. Do not stretch blankets/mattings tight - allow the rolls to mold to any irregularities.
4. For slopes less than 3H:1V, rolls may be placed in horizontal strips.
5. If there is a berm at the top of the slope, anchor upslope of the berm.
6. Lime, fertilize, and seed before installation. Planting of shrubs, trees, etc. should occur after installation.

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Slope Installation

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BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.

- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. However, the relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for applications greater than six months.
- Due to rapid runoff caused by plastic covering, do not use this method upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Plastic sheeting may result in increased runoff volumes and velocities, requiring additional on- site measures to counteract the increases. Creating a trough with wattles or other material can convey clean water away from these areas.
- To prevent undercutting, trench and backfill rolled plastic covering products.
- Although the plastic material is inexpensive to purchase, the cost of installation, maintenance, removal, and disposal add to the total costs of this BMP.
- Whenever plastic is used to protect slopes, install water collection measures at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. Do not mix clean runoff from a plastic covered slope with dirty runoff from a project.

- Other uses for plastic include:

    - Temporary ditch liner.
    - Pond liner in temporary sediment pond.
    - Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored.
    - Emergency slope protection during heavy rains.
    - Temporary drainpipe (“elephant trunk”) used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:

    1. Run plastic up and down the slope, not across the slope.
    2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet.
    3. Provide a minimum of 8-inch overlap at the seams.
    4. On long or wide slopes, or slopes subject to wind, tape all seams.
    5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
    6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and tie them together with twine to hold them in place.
    7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil, which causes extreme erosion.
    8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.

- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- Completely remove and replace the plastic if it begins to deteriorate due to ultraviolet radiation.
- Completely remove plastic when no longer needed.
- Dispose of old tires used to weight down plastic sheeting appropriately.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C140: Dust Control

Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Conditions of Use

Use dust control in areas (including roadways) subject to surface and air movement of dust where on-site or off-site impacts to roadways, drainage ways, or surface waters are likely.

Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until the surface is wet. Repeat as needed. To prevent carryout of mud onto the street, refer to BMP C105: Stabilized Construction Access and BMP C106: Wheel Wash.
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust

suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.

- PAM (BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection) added to water at a rate of 0.5 pounds per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily trans- ported by wind. Adding PAM may reduce the quantity of water needed for dust control. Note that the application rate specified here applies to this BMP, and is not the same application rate that is specified in BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection, but the downstream protections still apply.

Refer to

BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body.

- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Techniques that can be used for unpaved roads and lots include:
    - Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
    - Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
    - Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
    - Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
    - Encourage the use of alternate, paved routes, if available.
    - Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
    - Limit dust-causing work on windy days.
    - Pave unpaved permanent roads and other trafficked areas.

Maintenance Standards

Respray area as necessary to keep dust to a minimum.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

Design and Installation Specifications

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.
- Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.
- Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose of process water in a manner that does not violate ground water or surface water quality standards.
- Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and/or vacuum trucks.

BMP C203: Water Bars

Purpose

A water bar is a small ditch or ridge of material that is constructed diagonally across a road or right- of-way to divert stormwater runoff from the road surface, wheel tracks, or a shallow road ditch. See Figure II-3.12: Water Bar.

Conditions of Use

Clearing right-of-way and construction of access for power lines, pipelines, and other similar installations often require long narrow right-of-ways over sloping terrain. Disturbance and compaction pro- motes gully formation in these cleared strips by increasing the volume and velocity of runoff. Gully formation may be especially severe in tire tracks and ruts. To prevent gullying, runoff can often be diverted across the width of the right-of-way to undisturbed areas by using small predesigned diversions.

Give special consideration to each individual outlet area, as well as to the cumulative effect of added diversions. Use gravel to stabilize the diversion where significant vehicular traffic is anticipated.

Design and Installation Specifications

- Height: 8-inch minimum, measured from the channel bottom to the ridge top.
- Side slope of channel: 2H:1V maximum; 3H:1V or flatter when vehicles will cross.
- Top width of ridge: 6-inch minimum.
- Locate water bars to use natural drainage systems and to discharge into well vegetated stable areas.
- See Table II-3.9: Water Bar Spacing Guidelines:

Table II-3.9: Water Bar Spacing Guidelines

Slope Along Road (%)	Spacing (ft)
< 5	125
5 - 10	100
10 - 20	75
20 - 35	50
> 35	Use rock lined ditch

Grade of water bar and angle: Select an angle that results in a ditch slope less than 2 percent.

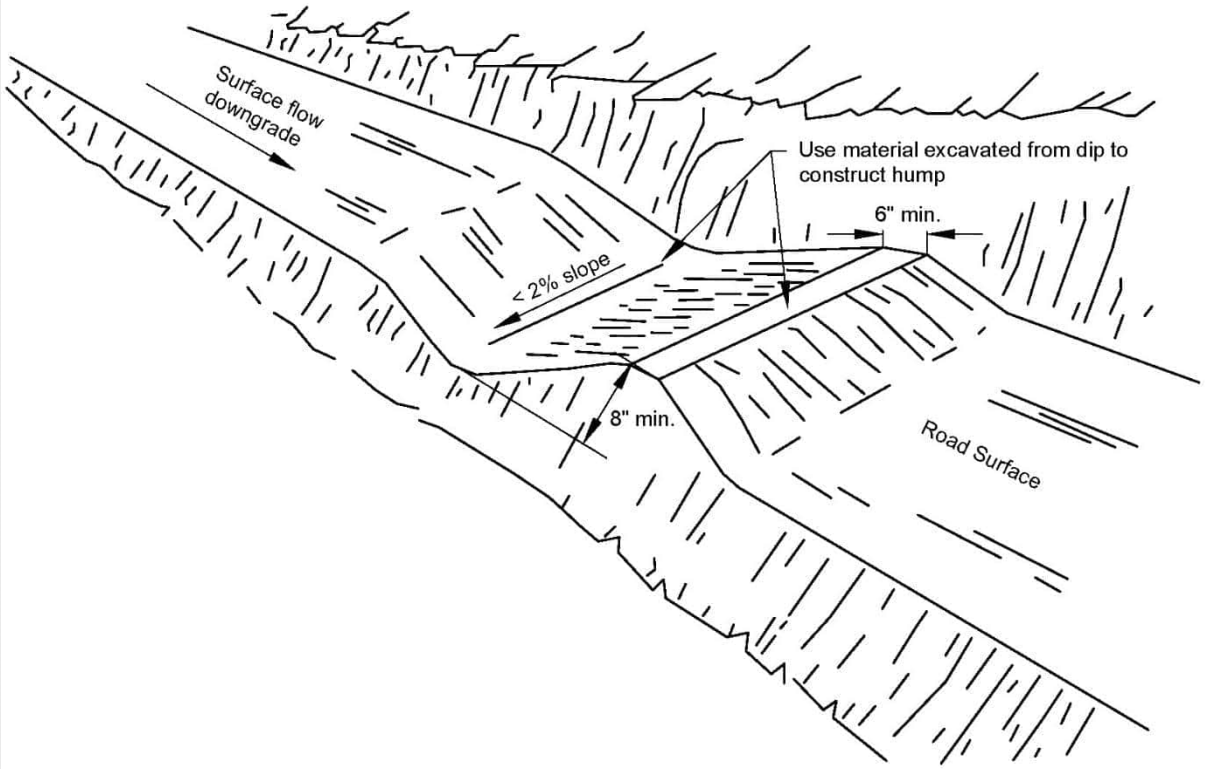
- Install the water bar as soon as the clearing and grading is complete. When utilities are being installed, reconstruct the water bar as construction is complete in each section.
- Compact the water bar ridge.
- Stabilize, seed, and mulch the portions that are not subject to traffic. Gravel the areas crossed by vehicles.
- Note that BMP C208: Triangular Silt Dike (TSD) can be used to create the ridge for the water bar.

Maintenance Standards

Periodically inspect water bars after every heavy rainfall for wear and erosion damage.

- Immediately remove sediment from the flow area and repair the dike.
- Check outlet areas and make timely repairs as needed.
- When permanent road drainage is established and the area above the temporary water bar is permanently stabilized, remove the dikes and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.

Figure II-3.12: Water Bar



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Water Bar

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BMP C209: Outlet Protection

Purpose

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions of Use

Use outlet protection at the outlets of all ponds, pipes, ditches, or other conveyances that discharge to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

Design and Installation Specifications

- The receiving channel at the outlet of a pipe shall be protected from erosion by lining a minimum of 6 feet downstream and extending up the channel sides a minimum of 1–foot above the maximum tailwater elevation, or 1-foot above the crown, whichever is higher. For pipes lar- ger than 18 inches in diameter, the outlet protection lining of the channel shall be four times the diameter of the outlet pipe.
- Standard wingwalls, tapered outlets, and paved channels should also be considered when appropriate for permanent culvert outlet protection (WSDOT, 2015).
- BMP C122: Nets and Blankets or BMP C202: Riprap Channel Lining provide suitable options for lining materials.
- With low flows, BMP C201: Grass-Lined Channels can be an effective alternative for lining material.
- The following guidelines shall be used for outlet protection with riprap:.
    - If the discharge velocity at the outlet is less than 5 fps, use 2-inch to 8-inch riprap. Minimum thickness is 1-foot.
    - For 5 to 10 fps discharge velocity at the outlet, use 24-inch to 48-inch riprap. Minimum thickness is 2 feet.
    - For outlets at the base of steep slope pipes (pipe slope greater than 10 percent), use an engineered energy dissipator.
    - Filter fabric or erosion control blankets should always be used under riprap to prevent scour and channel erosion. See BMP C122: Nets and Blankets.
- Bank stabilization, bioengineering, and habitat features may be required for disturbed areas. This work may require a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife. See I-2.11 Hydraulic Project Approvals.

Maintenance Standards

- Inspect and repair as needed.
- Add rock as needed to maintain the intended function.
- Clean energy dissipator if sediment builds up.

BMP C220: Inlet Protection

Purpose

Inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use inlet protection at inlets that are operational before permanent stabilization of the disturbed areas that contribute runoff to the inlet. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless those inlets are preceded by a sediment trapping BMP.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters can add significant amounts of sediment into the roof drain system. If possible, delay installing lawn and yard drains until just before landscaping, or cap these drains to prevent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

Table II-3.10: Storm Drain Inlet Protection

lists several options for inlet protection. All of the methods for inlet protection tend to plug and require a high frequency of maintenance. Limit contributing drain- age areas for an individual inlet to one acre or less. If possible, provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table II-3.10: Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding may occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area requirement: 30'x30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No	Paved or Earthen	Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.

Culvert Inlet Protection			
Culvert inlet sediment trap	N/A	N/A	18 month expected life.

Design and Installation Specifications

Excavated Drop Inlet Protection

Excavated drop inlet protection consists of an excavated impoundment around the storm drain inlet. Sediment settles out of the stormwater prior to entering the storm drain. Design and installation specifications for excavated drop inlet protection include:

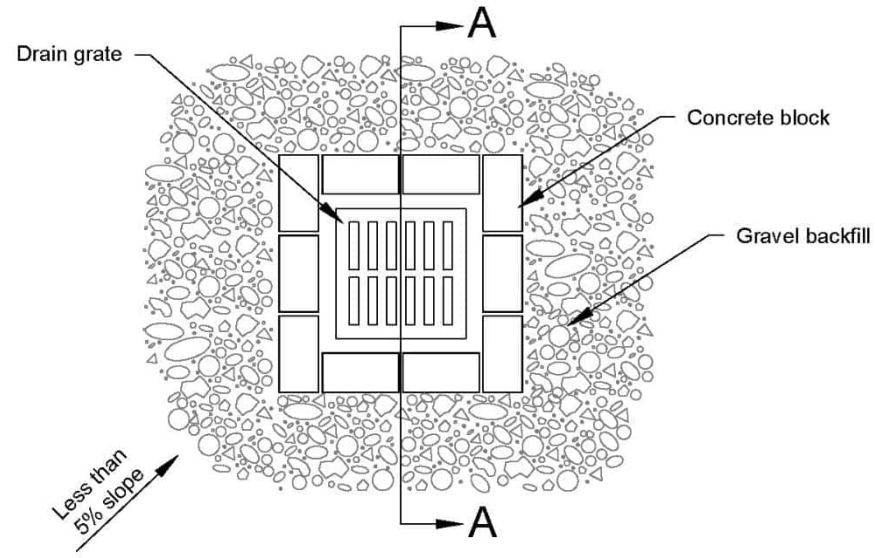
- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation should be no steeper than 2H:1V.
- Minimum volume of excavation is 35 cubic yards.
- Shape the excavation to fit the site, with the longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter

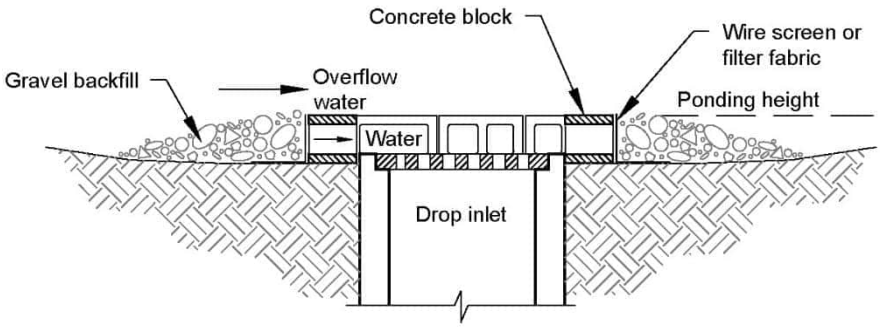
A block and gravel filter is a barrier formed around the inlet with standard concrete blocks and gravel. See Figure II-3.17: Block and Gravel Filter. Design and installation specifications for block gravel filters include:

- Provide a height of 1 to 2 feet above the inlet.
- Recess the first row of blocks 2-inches into the ground for stability.
- Support subsequent courses by placing a pressure treated wood 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side to allow for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel to just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel berm surrounding the inlet, as follows:
    - Provide a slope of 3H:1V on the upstream side of the berm.
    - Provide a slope of 2H:1V on the downstream side of the berm.
    - Provide a 1-foot wide level stone area between the gravel berm and the inlet.
    - Use stones 3 inches in diameter or larger on the upstream slope of the berm.
    - Use gravel ½- to ¾-inch at a minimum thickness of 1-foot on the downstream slope of the berm.

Figure II-3.17: Block and Gravel Filter



Plan View



Section A-A

Notes:

1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

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Block and Gravel Filter

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Gravel and Wire Mesh Filter

Gravel and wire mesh filters are gravel barriers placed over the top of the inlet. This method does not provide an overflow. Design and installation specifications for gravel and wire mesh filters include:

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
    - Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
    - Overlap the strips if more than one strip of mesh is necessary.

- Place coarse aggregate over the wire mesh.
    - Provide at least a 12-inch depth of aggregate over the entire inlet opening and extend at least 18-inches on all sides.

Catch Basin Filters

Catch basin filters are designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements, combine a catch basin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way. Design and installation specifications for catch basin filters include:

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catch basin filter in the catch basin just below the grating.

Curb Inlet Protection with Wooden Weir

Curb inlet protection with wooden weir is an option that consists of a barrier formed around a curb inlet with a wooden frame and gravel. Design and installation specifications for curb inlet protection with wooden weirs include:

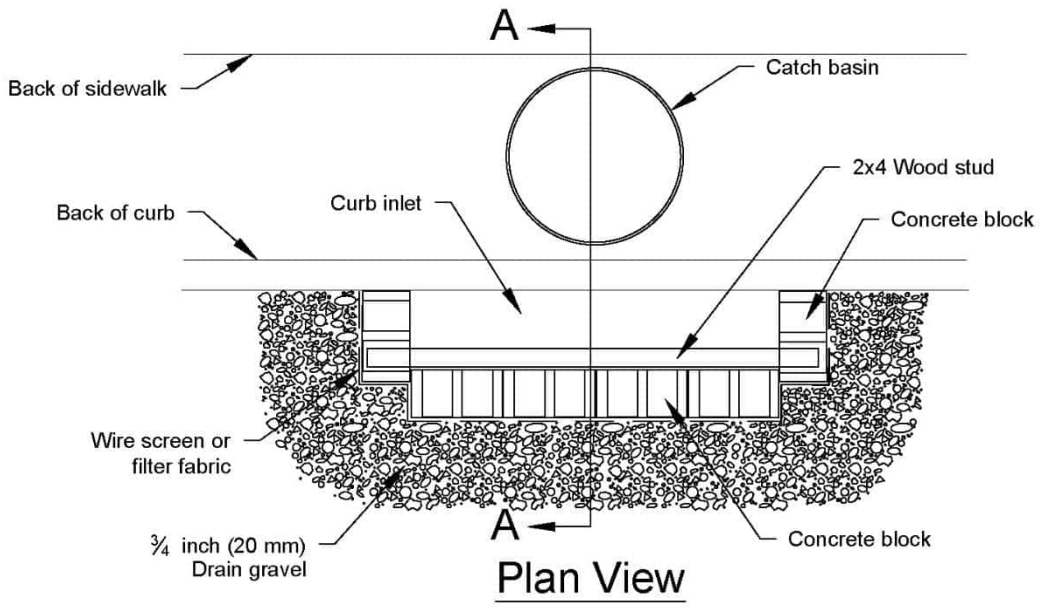
- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against the wire and fabric.
- Place weight on the frame anchors.

Block and Gravel Curb Inlet Protection

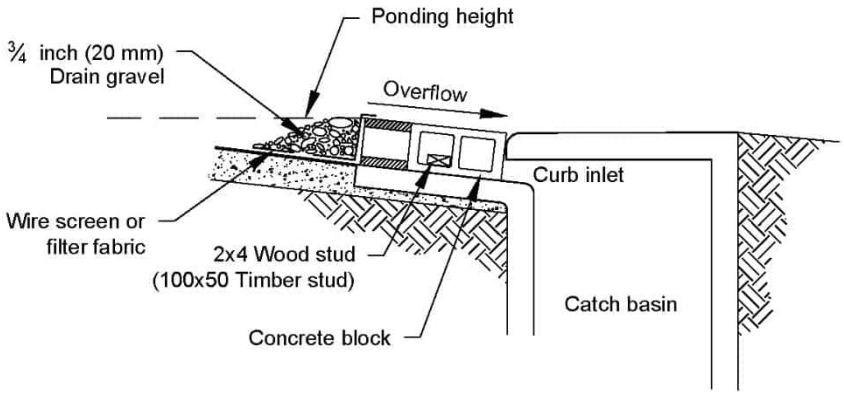
Block and gravel curb inlet protection is a barrier formed around a curb inlet with concrete blocks and gravel. See Figure II-3.18: Block and Gravel Curb Inlet Protection. Design and installation specifications for block and gravel curb inlet protection include:

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Figure II-3.18: Block and Gravel Curb Inlet Protection



Plan View



Section A-A

Notes:

1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Block and Gravel Curb Inlet Protection

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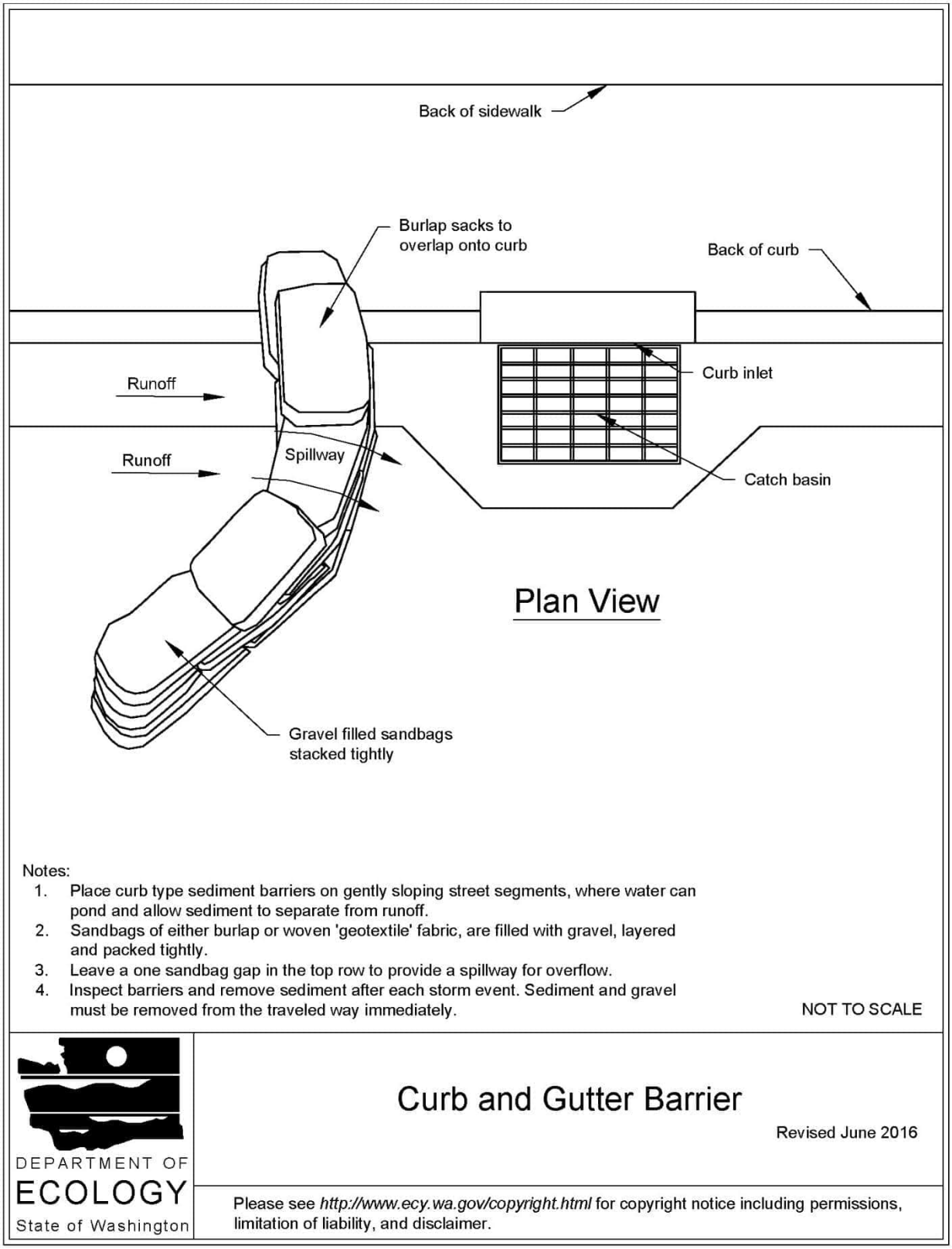
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Curb and Gutter Sediment Barrier

Curb and gutter sediment barrier is a sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure II-3.19: Curb and Gutter Barrier. Design and installation specifications for curb and gutter sediment barrier include:

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the upstream side of the berm. Size the trap to sediment trap standards for protecting a culvert inlet.

Figure II-3.19: Curb and Gutter Barrier



Notes:

1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Curb and Gutter Barrier

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Maintenance Standards

- Inspect all forms of inlet protection frequently, especially after storm events. Clean and replace clogged catch basin filters. For rock and gravel filters, pull away the rocks from the inlet and clean or replace. An alternative approach would be to use the clogged rock as fill and put fresh rock around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C233: Silt Fence

Purpose

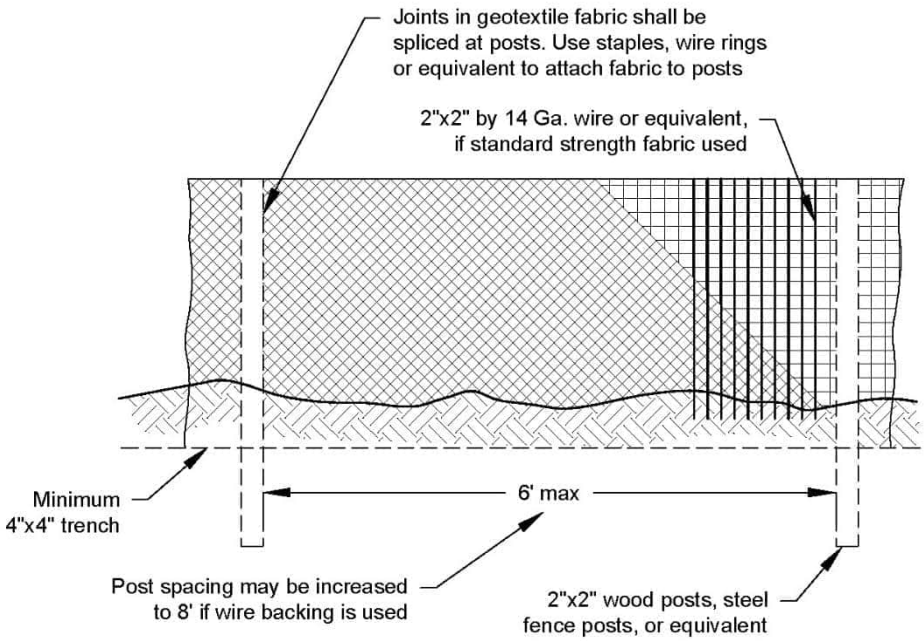
Silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

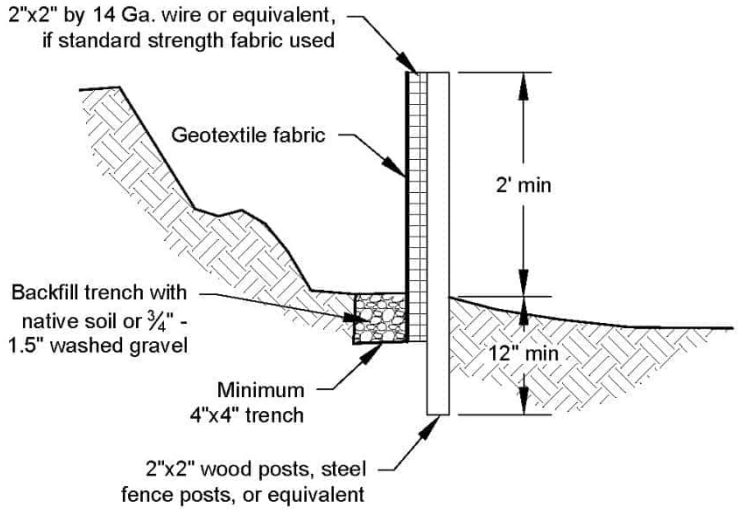
Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent sediment carried by runoff from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment trapping BMP.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

Figure II-3.22: Silt Fence





NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Silt Fence

Revised July 2017

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Design and Installation Specifications

- Use in combination with other construction stormwater BMPs.
- Maximum slope steepness (perpendicular to the silt fence line) 1H:1V.
- Maximum sheet or overland flow path length to the silt fence of 100 feet.
- Do not allow flows greater than 0.5 cfs.
- Use geotextile fabric that meets the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table I-3.11: Geotextile Fabric Standards for Silt Fence):

Table II-3.11: Geotextile Fabric Standards for Silt Fence

Geotextile Property	Minimum Average Roll Value
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film woven (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Support standard strength geotextiles with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the geotextile. Silt fence materials are available that have synthetic mesh backing attached.
- Silt fence material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F to 120°F.
- One-hundred percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by the local jurisdiction.
- Refer to Figure II-3.22: Silt Fence for standard silt fence details. Include the following Standard Notes for silt fence on construction plans and specifications:

1. The Contractor shall install and maintain temporary silt fences at the locations shown in the Plans.
2. Construct silt fences in areas of clearing, grading, or drainage prior to starting those activities.
3. The silt fence shall have a 2-feet min. and a 2½-feet max. height above the original ground surface.
4. The geotextile fabric shall be sewn together at the point of manufacture to form fabric lengths as required. Locate all sewn seams at support posts. Alternatively, two sections of silt fence can be overlapped, provided that the overlap is long enough and that the adjacent silt fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

5. Attach the geotextile fabric on the up-slope side of the posts and secure with staples, wire, or in accordance with the manufacturer's recommendations. Attach the geotextile fabric to the posts in a manner that reduces the potential for tearing.
6. Support the geotextile fabric with wire or plastic mesh, dependent on the properties of the geotextile selected for use. If wire or plastic mesh is used, fasten the mesh securely to the up-slope side of the posts with the geotextile fabric up-slope of the mesh.
7. Mesh support, if used, shall consist of steel wire with a maximum mesh spacing of 2-inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to the same level of ultraviolet radiation as the geotextile fabric it supports.
8. Bury the bottom of the geotextile fabric 4-inches min. below the ground surface. Backfill and tamp soil in place over the buried portion of the geotextile fabric, so that no flow can pass beneath the silt fence and scouring cannot occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the ground 3-inches min.
9. Drive or place the silt fence posts into the ground 18-inches min. A 12–inch min. depth is allowed if topsoil or other soft subgrade soil is not present and 18-inches cannot be reached. Increase fence post min. depths by 6 inches if the fence is located on slopes of 3H:1V or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.
10. Use wood, steel or equivalent posts. The spacing of the support posts shall be a maximum of 6-feet. Posts shall consist of either:

    - Wood with minimum dimensions of 2 inches by 2 inches by 3 feet. Wood shall be free of defects such as knots, splits, or gouges.
    - No. 6 steel rebar or larger.
    - ASTM A 120 steel pipe with a minimum diameter of 1-inch.
    - U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft.
    - Other steel posts having equivalent strength and bending resistance to the post sizes listed above.

11. Locate silt fences on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.
12. If the fence must cross contours, with the exception of the ends of the fence, place check dams perpendicular to the back of the fence to minimize concentrated flow and erosion. The slope of the fence line where contours must be crossed shall not be steeper than 3H:1V.

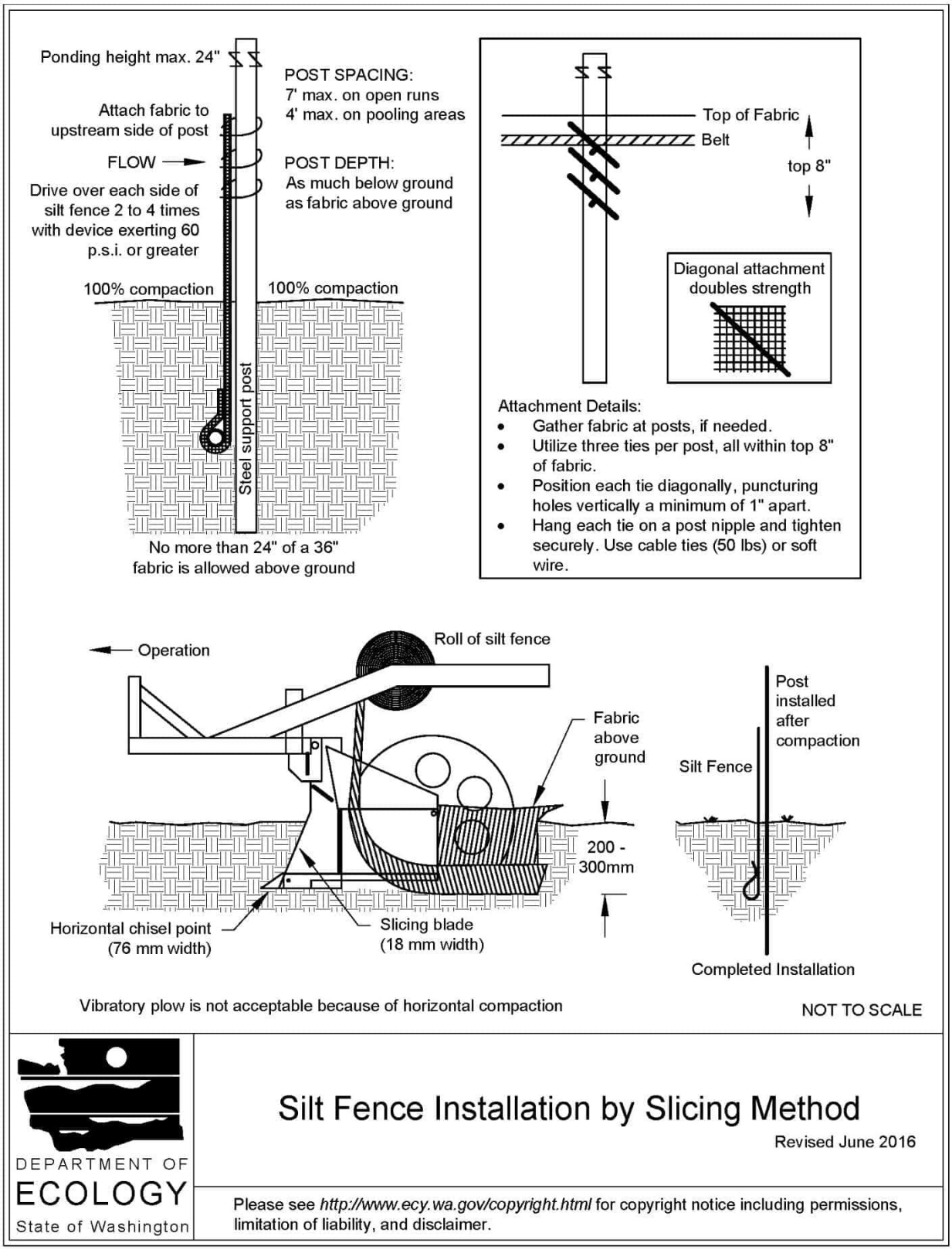
    - Check dams shall be approximately 1-foot deep at the back of the fence. Check dams shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence.
    - Check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. Check dams shall be located every 10 feet along the fence where the fence must cross contours.

- Refer to Figure II-3.23: Silt Fence Installation by Slicing Method for slicing method details. The following are specifications for silt fence installation using the slicing method:

1. The base of both end posts must be at least 2- to 4-inches above the top of the geo- textile fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

2. Install posts 3- to 4-feet apart in critical retention areas and 6- to 7-feet apart in standard applications.
3. Install posts 24-inches deep on the downstream side of the silt fence, and as close as possible to the geotextile fabric, enabling posts to support the geotextile fabric from upstream water pressure.
4. Install posts with the nipples facing away from the geotextile fabric.
5. Attach the geotextile fabric to each post with three ties, all spaced within the top 8- inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1-inch vertically apart. Each tie should be positioned to hang on a post nipple when tightening to prevent sagging.
6. Wrap approximately 6-inches of the geotextile fabric around the end posts and secure with 3 ties.
7. No more than 24-inches of a 36-inch geotextile fabric is allowed above ground level.
8. Compact the soil immediately next to the geotextile fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips. Check and correct the silt fence installation for any deviation before compaction. Use a flat-bladed shovel to tuck the fabric deeper into the ground if necessary.

Figure II-3.23: Silt Fence Installation by Slicing Method



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State of Washington

Silt Fence Installation by Slicing Method

Revised June 2016

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Maintenance Standards

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment trapping BMP.
- Check the uphill side of the silt fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence and remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace geotextile fabric that has deteriorated due to ultraviolet breakdown.

BMP C235: Wattles

Purpose

Wattles are temporary erosion and sediment control barriers consisting of straw, compost, or other material that is wrapped in netting made of natural plant fiber or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment.

Conditions of Use

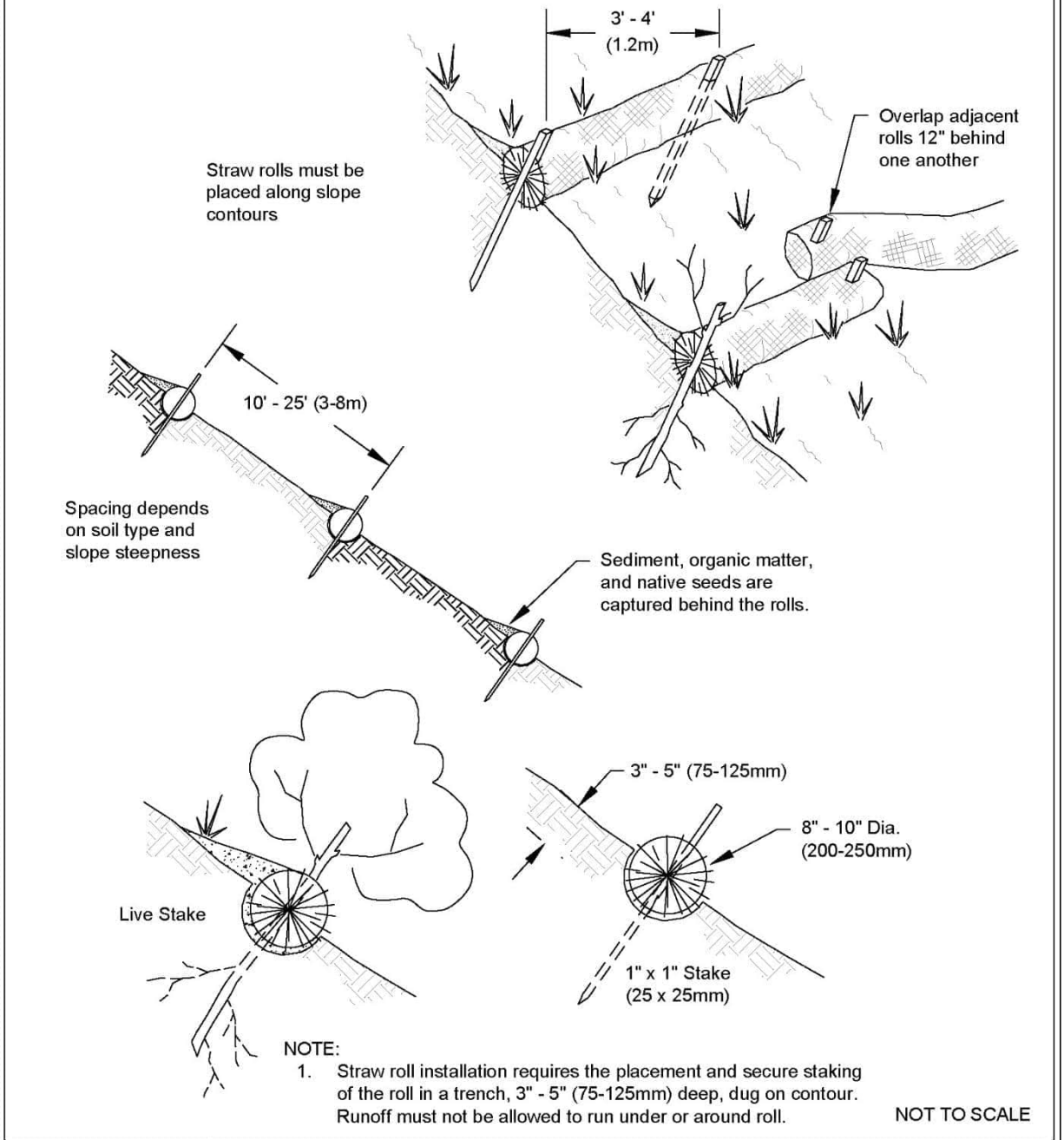
- Wattles shall consist of cylinders of plant material such as weed-free straw, coir, wood chips, excelsior, or wood fiber or shavings encased within netting made of natural plant fibers unaltered by synthetic materials.
- Use wattles:
    - In disturbed areas that require immediate erosion protection.
    - On exposed soils during the period of short construction delays, or over winter months.
    - On slopes requiring stabilization until permanent vegetation can be established.
- The material used dictates the effectiveness period of the wattle. Generally, wattles are effective for one to two seasons.
- Prevent rilling beneath wattles by entrenching and overlapping wattles to prevent water from passing between them.

Design Criteria

- See Figure II-3.24: Wattles for typical construction details.
- Wattles are typically 8 to 10 inches in diameter and 25 to 30 feet in length.
- Install wattles perpendicular to the flow direction and parallel to the slope contour.
- Place wattles in shallow trenches, staked along the contour of disturbed or newly constructed slopes. Dig narrow trenches across the slope (on contour) to a depth of 3- to 5-inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5- to 7- inches, or 1/2 to 2/3 of the thickness of the wattle.
- Start building trenches and installing wattles from the base of the slope and work up. Spread excavated material evenly along the uphill slope and compact it using hand tamping or other methods.
- Construct trenches at intervals of 10- to 25-feet depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches.

- Install the wattles snugly into the trenches and overlap the ends of adjacent wattles 12 inches behind one another.
- Install stakes at each end of the wattle, and at 4-foot centers along entire length of wattle.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the wattle and into the soil.
- Wooden stakes should be approximately 0.75 x 0.75 x 24 inches min. Willow cuttings or 3/8-inch rebar can also be used for stakes.
- Stakes should be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle.

Figure II-3.24: Wattles



DEPARTMENT OF ECOLOGY
State of Washington

Wattles

Revised December 2016

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Maintenance Standards

- Wattles may require maintenance to ensure they are in contact with soil and thoroughly entrenched, especially after significant rainfall on steep sandy soils.
- Inspect the slope after significant storms and repair any areas where wattles are not tightly abutted or water has scoured beneath the wattles.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

Alternative Construction Stormwater BMPs

BMP C106: Wheel Wash

Purpose

Wheel washes reduce the amount of sediment transported onto paved roads by washing dirt from the wheels of motor vehicles prior to the motor vehicles leaving the construction site.

Conditions of Use

- Use a wheel wash when BMP C105: Stabilized Construction Access is not preventing sediment from being tracked off site.
- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.
- Wheel wash wastewater is not stormwater. It is commonly called process water, and must be discharged to a separate on-site treatment system that prevents discharge to waters of the State, or to the sanitary sewer with local sewer district approval.
- Wheel washes may use closed-loop recirculation systems to conserve water use.
- Wheel wash wastewater shall not include wastewater from concrete washout areas.
- When practical, the wheel wash should be placed in sequence with BMP C105: Stabilized Construction Access. Locate the wheel wash such that vehicles exiting the wheel wash will enter directly onto BMP C105: Stabilized Construction Access. In order to achieve this, BMP C105: Stabilized Construction Access may need to be extended beyond the standard installation to meet the exit of the wheel wash.

Design and Installation Specifications

Suggested details are shown in Figure II-3.2: Wheel Wash. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.

Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.

Midpoint spray nozzles are only needed in extremely muddy conditions.

Wheel wash systems should be designed with a small grade change, 6- to 12-inches for a 10-foot-wide pond, to allow sediment to flow to the low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2- to 3-foot riser should be installed on the low side of the pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 - 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck can be used to change the wash water.

Maintenance Standards

The wheel wash should start out each day with fresh water.

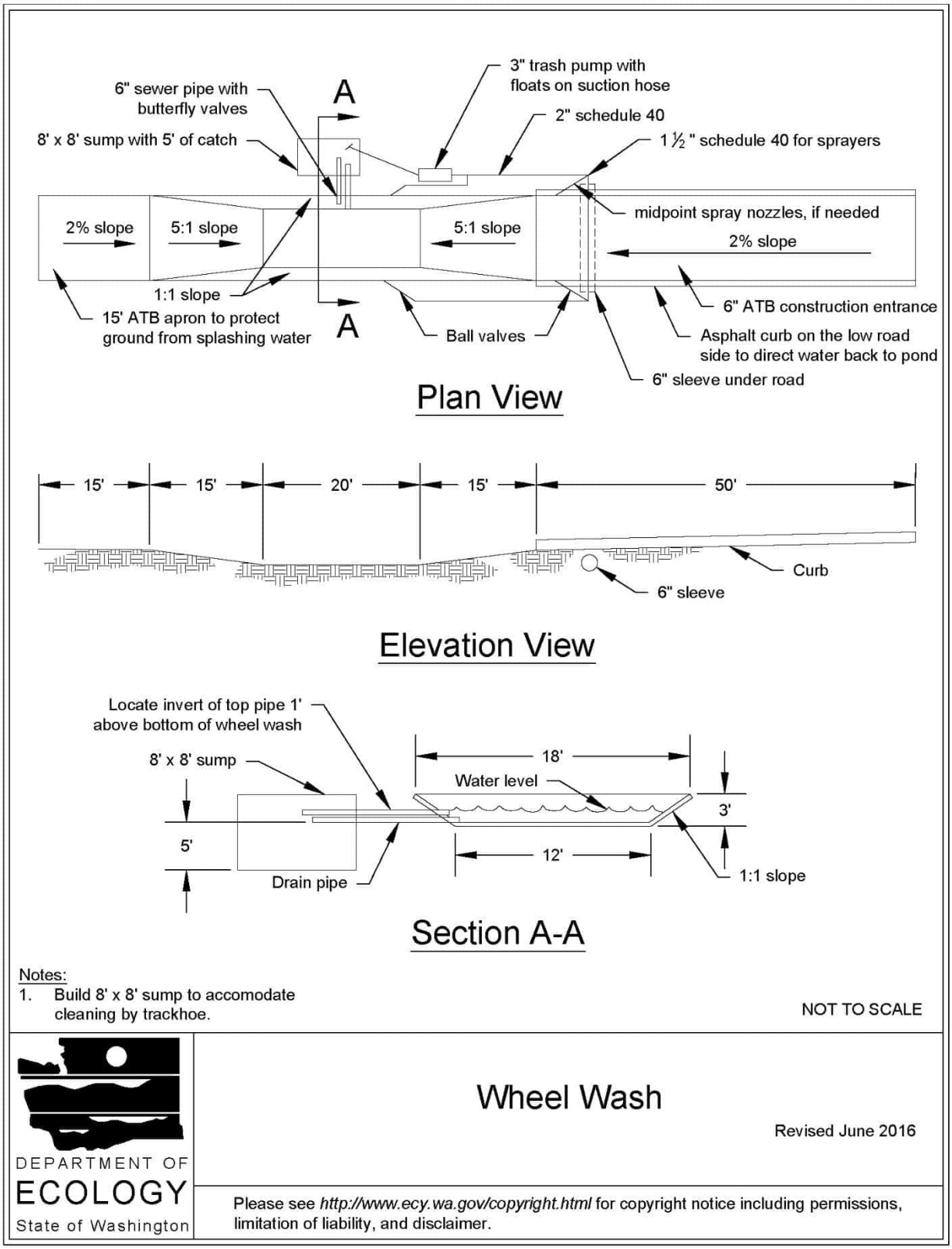
The wheel wash water should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the wheel wash water will need to be changed more often.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

Figure II-3.2: Wheel Wash



Notes:

1. Build 8' x 8' sump to accomodate cleaning by trackhoe.

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State of Washington

Wheel Wash

Revised June 2016

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BMP C124: Sodding

Purpose

The purpose of sodding is to establish turf for immediate erosion protection and to stabilize drainage paths where concentrated overland flow will occur.

Conditions of Use

Sodding may be used in the following areas:

- Disturbed areas that require short-term or long-term cover.
- Disturbed areas that require immediate vegetative cover.
- All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.

Design and Installation Specifications

Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength.

The following steps are recommended for sod installation:

1. Shape and smooth the surface to final grade in accordance with the approved grading plan. Consider any areas (such as swales) that need to be overexcavated below design elevation to allow room for placing soil amendment and sod.
2. Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. See https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Organic-materials/Managing-organics-compost for further information.
3. Fertilize according to the sod supplier's recommendations.
4. Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface.
5. Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip.
6. Roll the sodded area and irrigate.
7. When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.

Maintenance Standards

If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

BMP C125: Topsoiling / Composting

Purpose

Topsoiling and composting provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling and composting are an integral com- ponent of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Use this BMP in conjunction with other BMPs such as BMP C120: Temporary and Permanent Seeding, BMP C121: Mulching, or BMP C124: Sodding. Implementation of this BMP may meet the post-construction requirements of BMP T5.13: Post-Construction Soil Quality and Depth.

Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches including organic debris.

Conditions of Use

- Permanent landscaped areas shall contain healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetative health and vitality, improves hydrologic characteristics, and reduces the need for irrigation.
- Leave native soils and the duff layer undisturbed to the maximum extent practicable. Stripping of existing, properly functioning soil system and vegetation for the purpose of topsoiling during construction is not acceptable. Preserve existing soil systems in undisturbed and uncompacted conditions if functioning properly.
- Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.
- Restore, to the maximum extent practical, native soils disturbed during clearing and grading to a condition equal to or better than the original site condition's moisture-holding capacity. Use on-site native topsoil, incorporate amendments into on-site soil, or import blended topsoil to meet this requirement.
- Topsoiling is a required procedure when establishing vegetation on shallow soils, and soils of critically low pH (high acid) levels.
- Beware of where the topsoil comes from, and what vegetation was on site before disturbance. Invasive plant seeds may be included and could cause problems for establishing native plants, landscaped areas, or grasses.
  Topsoil from the site will contain mycorrhizal bacteria that are necessary for healthy root growth and nutrient transfer. These native mycorrhiza are acclimated to the site and will provide optimum conditions for establishing grasses. Use commercially available mycorrhiza products when using off-site topsoil.

Design and Installation Specifications

Meet the following requirements for disturbed areas that will be developed as lawn or landscaped areas at the completed project site:

- Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil shall have:

    - A minimum depth of 8-inches. Scarify subsoils below the topsoil layer at least 4-inches with some incorporation of the upper material to avoid stratified layers, where feasible. Ripping or re-structuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system.
    - A minimum organic content of 10% dry weight in planting beds, and 5% organic matter content in turf areas. Incorporate organic amendments to a minimum 8-inch depth except where tree roots or other natural features limit the depth of incorporation.
    - A pH between 6.0 and 8.0 or matching the pH of the undisturbed soil.
    - If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve.
- Mulch planting beds with 2 inches of organic material
- Accomplish the required organic content, depth, and pH by returning native topsoil to the site, importing topsoil of sufficient organic content, and/or incorporating organic amendments. When using the option of incorporating amendments to meet the organic content requirement, use compost that meets the compost specification for Bioretention (See BMP T7.30: Bioretention), with the exception that the compost may have up to 35% biosolids or manure.
- Sections 3 through 7 of *Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington* (Stenn et al., 2016), provides useful guidance for implementing whichever option is chosen. It includes guidance for pre-approved default strategies and guidance for custom strategies. Check with your local jurisdiction concerning its acceptance of this guidance.
- The final composition and construction of the soil system will result in a natural selection or favoring of certain plant species over time. For example, incorporation of topsoil may favor grasses, while layering with mildly acidic, high-carbon amendments may favor more woody vegetation.
- Allow sufficient time in scheduling for topsoil spreading prior to seeding, sodding, or planting.
- Take care when applying topsoil to subsoils with contrasting textures. Sandy topsoil over clayey subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to establish vegetation. The best method to promote bonding is to actually work the topsoil into the layer below for a depth of at least 6 inches.
- Field exploration of the site shall be made to determine if there is surface soil of sufficient quantity and quality to justify stripping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, and clay loam). Avoid areas of natural ground water recharge.
- Stripping shall be confined to the immediate construction area. A 4-inch to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All surface runoff control structures shall be in place prior to stripping.
- Do not place topsoil while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- In any areas requiring grading, remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas. Reapply stock- piled topsoil to other portions of the site where feasible.
- Locate the topsoil stockpile so that it meets specifications and does not interfere with work on the site. It may be possible to locate more than one pile in proximity to areas where topsoil will be used.
- Stockpiling of topsoil shall occur in the following manner:
    - Side slopes of the stockpile shall not exceed 2H:1V.

    - Between October 1 and April 30:
        - An interceptor dike with gravel outlet and silt fence shall surround all topsoil.
        - Within 2 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
    - Between May 1 and September 30:
        - An interceptor dike with gravel outlet and silt fence shall surround all topsoil if the stockpile will remain in place for a longer period of time than active construction grading.
        - Within 7 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- When native topsoil is to be stockpiled and reused the following should apply to ensure that the mycorrhizal bacterial, earthworms, and other beneficial organisms will not be destroyed:
    - Re-install topsoil within 4 to 6 weeks.
    - Do not allow the saturation of topsoil with water.
    - Do not use plastic covering.

Maintenance Standards

- Inspect stockpiles regularly, especially after large storm events. Stabilize any areas that have eroded.
- Establish soil quality and depth toward the end of construction and once established, protect from compaction, such as from large machinery use, and from erosion.
- Plant and mulch soil after installation.
- Leave plant debris or its equivalent on the soil surface to replenish organic matter.
- Reduce and adjust, where possible, the use of irrigation, fertilizers, herbicides and pesticides, rather than continuing to implement formerly established practices.

BMP C130: Surface Roughening

Purpose

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface. Horizontal depressions are created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Use this BMP in conjunction with other BMPs such as BMP C120: Temporary and Permanent Seeding, BMP C121: Mulching, or BMP C124: Sodding.

Conditions for Use

- All slopes steeper than 3H:1V and greater than 5 vertical feet require surface roughening to a depth of 2 to 4 inches prior to seeding.
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

Design and Installation Specifications

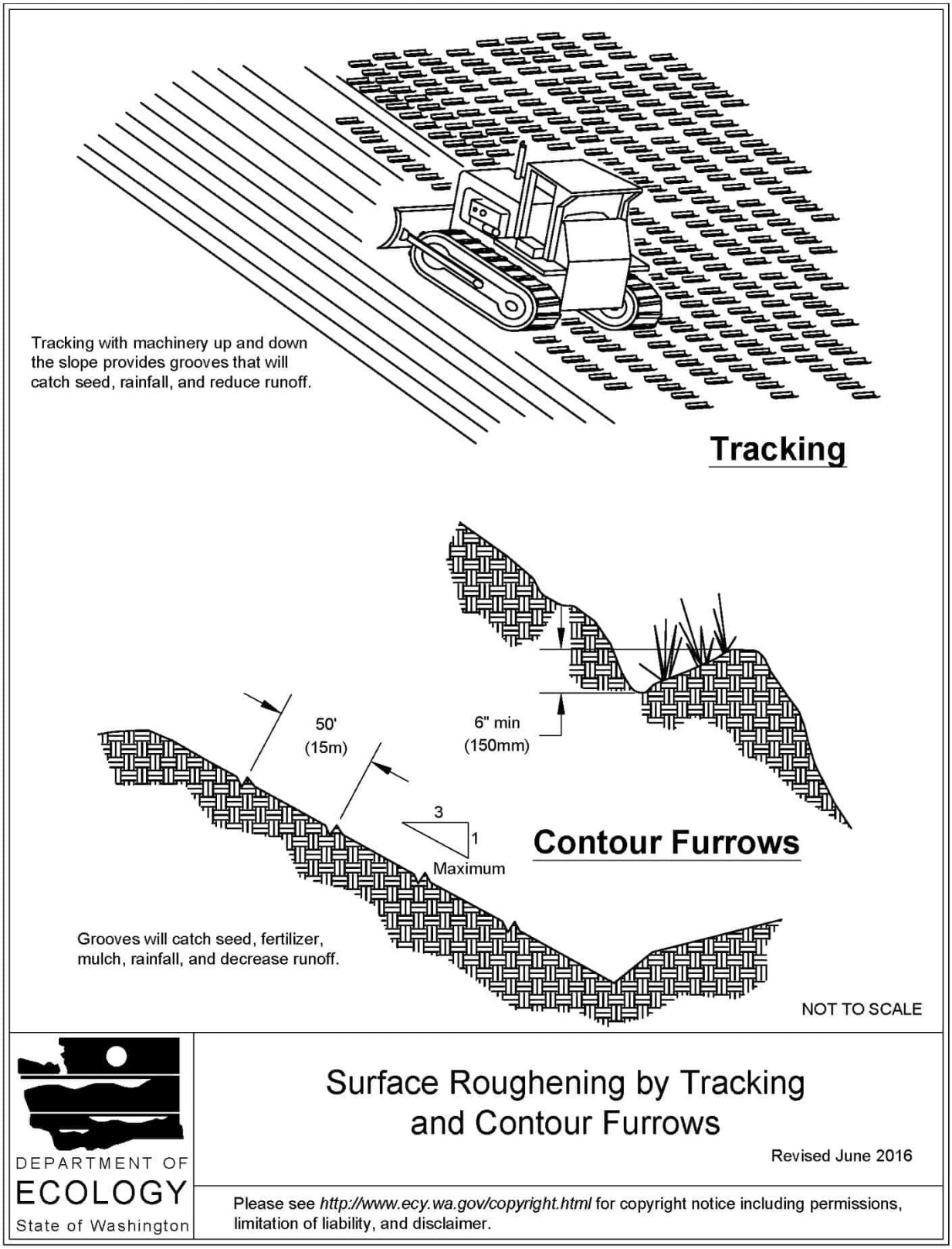
There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, contour furrows, and tracking. See Figure II-3.5: Surface Roughening by Tracking and Contour Furrows. Factors to be considered in choosing a roughening method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

- Disturbed areas that will not require mowing may be stair-step graded, grooved, or left rough after filling.
- Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material that sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment. Stair steps must be on contour or gullies will form on the slope.
- Areas that will be mowed (these areas should have slopes less steep than 3H:1V) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour.
- Graded areas with slopes steeper than 3H:1V but less than 2H:1V should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, leaving a pattern of cleat imprints parallel to slope contours.
- Tracking is done by operating equipment up and down the slope to leave horizontal depressions in the soil.

Maintenance Standards

- Areas that are surface roughened should be seeded as quickly as possible.
- Regular inspections should be made of the area. If rills appear, they should be re-roughened and re-seeded immediately.

Figure II-3.5: Surface Roughening by Tracking and Contour Furrows



BMP C150: Materials on Hand

Purpose

Keep quantities of erosion prevention and sediment control materials on the project site at all times to be used for regular maintenance and emergency situations such as unexpected heavy rains. Having these materials on-site reduces the time needed to replace existing or implement new BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible, pipe, sandbags, geotextile fabric and steel “T” posts.
- Materials should be stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or project proponent could keep a stockpile of materials that are available for use on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum list of items that will cover numerous situations includes:

- Clear Plastic, 6 mil
- Drainpipe, 6 or 8 inch diameter
- Sandbags, filled
- Straw Bales for mulching
- Quarry Spalls
- Washed Gravel
- Geotextile Fabric
- Catch Basin Inserts
- Steel "T" Posts
- Silt fence material
- Straw Wattles

Maintenance Standards

- All materials with the exception of the quarry spalls, steel “T” posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials as needed.

BMP C232: Gravel Filter Berm

Purpose

A gravel filter berm retains sediment by filtering runoff through a berm of gravel or crushed rock.

Conditions of Use

Use a gravel filter berm where a temporary measure is needed to retain sediment from construction sites.

Do not place gravel filter berms in traffic areas; gravel filter berms are not intended to be driven over.

Place gravel filter berms perpendicular to the flow of runoff, such that the runoff will filter through the berm prior to leaving the site.

Design and Installation Specifications

- Berm material shall be ¾ to 3 inches in size, washed well-grade gravel or crushed rock with less than 5 percent fines. Do not use crushed concrete.
- Spacing of berms:
  - Every 300 feet on slopes less than 5 percent
  - Every 200 feet on slopes between 5 percent and 10 percent
  - Every 100 feet on slopes greater than 10 percent
- Berm dimensions:
  - 1 foot high with 3H:1V side slopes
  - 8 linear feet per 1 cfs runoff based on the 10-year, 24-hour design storm
- See Figure II-3.21: Gravel Filter Berm for a photo of a gravel filter berm application.

Maintenance Standards

Regular inspection is required. Sediment shall be removed and filter material replaced as needed

Figure II-3.21: Gravel Filter Berm



DEPARTMENT OF ECOLOGY
State of Washington

Gravel Filter Berm

Revised July 2017

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BMP C234: Vegetated Strip

Purpose

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Vegetated strips may be used downslope of all disturbed areas.
- Vegetated strips are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to BMP C241: Sediment Pond (Temporary) or other sediment trapping BMP. The only circumstance in which overland flow can be treated solely by a vegetated strip, rather than by a sediment trapping BMP, is when the following criteria are met (see Table II-3.12: Contributing Drainage Area for Vegetated Strips):

Table II-3.12: Contributing Drainage Area for Vegetated Strips

Average Contributing Area Slope	ontributing Area Per- cent Slope	Max Contributing area Flowpath Length
1.5H : 1V or flatter	67% or flatter	100 feet
2H : 1V or flatter	50% or flatter	115 feet
4H : 1V or flatter	25% or flatter	150 feet
6H : 1V or flatter	16.7% or flatter	200 feet
10H : 1V or flatter	10% or flatter	250 feet

Design and Installation Specifications

- The vegetated strip shall consist of a continuous strip of dense vegetation with topsoil for a minimum of a 25-foot length along the flowpath. Grass-covered, landscaped areas are generally not adequate because the volume of sediment overwhelms the grass. Ideally, vegetated strips shall consist of undisturbed native growth with a well-developed soil that allows for infiltration of runoff.
- The slope within the vegetated strip shall not exceed 4H:1V.
- The uphill boundary of the vegetated strip shall be delineated with clearing limits.

Maintenance Standards

- Any areas damaged by erosion or construction activity shall be seeded immediately and protected by mulch.
- If more than 5 feet of the original vegetated strip width has had vegetation removed or is being eroded, sod must be installed.
- If there are indications that concentrated flows are traveling across the vegetated strip, storm-water runoff controls must be installed to reduce the flows entering the vegetated strip, or additional perimeter protection must be installed.

BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

- Sediment traps are intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the tributary area is permanently protected against erosion by vegetation and/or structures.
- Sediment traps are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.
- Projects that are constructing permanent Flow Control BMPs, or Runoff Treatment BMPs that use ponding for treatment, may use the rough-graded or final-graded permanent BMP footprint for the temporary sediment trap. When permanent BMP footprints are used as temporary sediment traps, the surface area requirement of the sediment trap must be met. If the surface area requirement of the sediment trap is larger than the surface area of the permanent BMP, then the sediment trap shall be enlarged beyond the permanent BMP footprint to comply with the surface area requirement.
- A floating pond skimmer may be used for the sediment trap outlet if approved by the Local Per- mitting Authority.
- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Design and Installation Specifications

- See Figure II-3.26: Cross Section of Sediment Trap and Figure II-3.27: Sediment Trap Outlet for details.
- To determine the sediment trap geometry, first calculate the design surface area (SA) of the trap, measured at the invert of the weir. Use the following equation:

$$SA = FS(Q_2/V_s)$$

where

Q_2 =

  - Option 1 - Single Event Hydrograph Method:

Q_2 = Peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 2-year, 24-hour frequency storm for the developed condition. The 10-year peak volumetric flow rate shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection.

- Option 2 - For construction sites that are less than 1 acre, the Rational Method may be used to determine Q_2.

V_S = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm3 has been selected as the particle of interest and has a settling velocity (Vs) of 0.00096 ft/sec.

FS = A safety factor of 2 to account for non-ideal settling.

Therefore, the equation for computing sediment trap surface area becomes: SA = 2 x

$$Q_2/0.00096$$

or

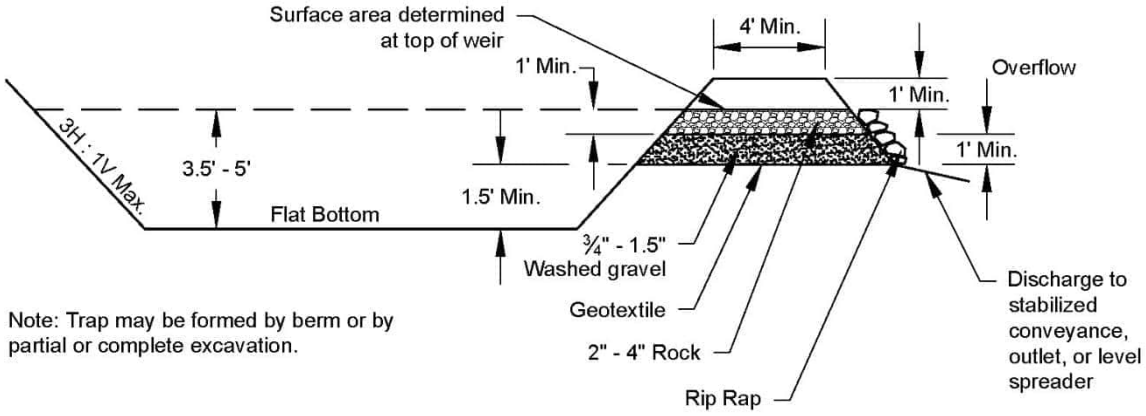
2080 square feet per cfs of inflow

- Sediment trap depth shall be 3.5 feet minimum from the bottom of the trap to the top of the overflow weir.
- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.
- Design the discharge from the sediment trap by using the guidance for discharge from temporary sediment ponds in BMP C241: Sediment Pond (Temporary).

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the trap embankments or slopes shall be repaired.

Figure II-3.26: Cross Section of Sediment Trap



Note: Trap may be formed by berm or by partial or complete excavation.

NOT TO SCALE

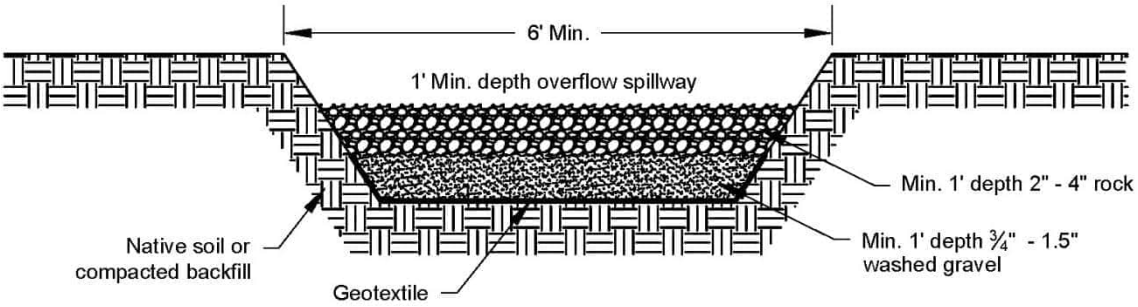
DEPARTMENT OF ECOLOGY
State of Washington

Cross Section of Sediment Trap

Revised June 2016

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Figure II-3.27: Sediment Trap Outlet



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DEPARTMENT OF
ECOLOGY
State of Washington

Sediment Trap Outlet

Revised June 2016

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BMP C251: Construction Stormwater Filtration

Purpose

Filtration removes sediment from runoff originating from disturbed areas of the site.

Conditions of Use

Traditional Construction Stormwater BMPs used to control soil erosion and sediment loss from construction sites may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5 µm). The reduction in turbidity will be dependent on the particle size distribution of the sediment in the stormwater. In some circumstances, sedimentation and filtration may achieve compliance with the water quality standard for turbidity.

The use of construction stormwater filtration does not require approval from Ecology as long as treatment chemicals are not used. Filtration in conjunction with BMP C250: Construction Stormwater Chemical Treatment requires testing under the Chemical Technology Assessment Protocol – Ecology (CTAPE) before it can be initiated. Approval from Ecology must be obtained at each site where chemical use is proposed prior to use. See https://-fortress.wa.gov/ecy/publications/SummaryPages/ecy070258.html for a copy of the Request for Chemical Treatment form.

Design and Installation Specifications

Two types of filtration systems may be applied to construction stormwater treatment: rapid and slow.

Rapid filtration systems are the typical system used for water and wastewater treatment. They can achieve relatively high hydraulic flow rates, on the order of 2 to 20 gpm/sf, because they have automatic backwash systems to remove accumulated solids.

Slow filtration systems have very low hydraulic rates, on the order of 0.02 gpm/sf, because they do not have backwash systems. Slow filtration systems have generally been used as post construction BMPs to treat stormwater (see V-6 Filtration BMPs). Slow filtration is mechanically simple in comparison to rapid filtration, but requires a much larger filter area.

Filter Types and Efficiencies

Sand media filters are available with automatic backwashing features that can filter to 50 µm particle size. Screen or bag filters can filter down to 5 µm. Fiber wound filters can remove particles down to 0.5 µm. Filters should be sequenced from the largest to the smallest pore opening. Sediment removal efficiency will be related to particle size distribution in the stormwater.

Treatment Process and Description

Stormwater is collected at interception point(s) on the site and diverted to an untreated stormwater sediment pond or tank for removal of large sediment, and storage of the stormwater before it is treated by the filtration system. In a rapid filtration system, the untreated stormwater is pumped from the pond or tank through the filtration media. Slow filtration systems are designed using gravity to convey water from the pond or tank to and through the filtration media.

Sizing

Filtration treatment systems must be designed to control the velocity and peak volumetric flow rate that is discharged from the system and consequently the project site. See Element 3: Control Flow Rates for further details on this requirement.

The untreated stormwater storage pond or tank should be sized to hold 1.5 times the volume of run-off generated from the site during the 10-year, 24-hour storm event, minus the filtration treatment system flowrate for an 8-hour period. For a chitosan-enhanced sand filtration system, the filtration treatment system flowrate should be sized using a hydraulic loading rate between 6-8 gpm/ft^2. Other hydraulic loading rates may be more appropriate for other systems. Bypass should be provided around the filtration treatment system to accommodate extreme storm events. Runoff volume shall be calculated using the methods presented in III-2.3 Single Event Hydrograph Method. Worst-case land cover conditions (i.e., producing the most runoff) should be used for analyses (in most cases, this would be the land cover conditions just prior to final landscaping).

If the filtration treatment system design does not allow you to discharge at the rates as required by Element 3: Control Flow Rates, and if the site has a permanent Flow Control BMP that will serve the planned development, the discharge from the filtration treatment system may be directed to the permanent Flow Control BMP to comply with Element 3: Control Flow Rates. In this case, all discharge (including water passing through the treatment system and stormwater bypassing the treatment system) will be directed into the permanent Flow Control BMP. If site constraints make locating the untreated stormwater storage pond difficult, the permanent Flow Control BMP may be divided to serve as the untreated stormwater storage pond and the post-treatment temporary flow control pond. A berm or barrier must be used in this case so the untreated water does not mix with the treated water. Both untreated stormwater storage requirements, and adequate post-treatment flow control must be achieved. The designer must document in the Construction SWPPP how the permanent. Flow Control BMP is able to attenuate the discharge from the site to meet the requirements of Element 3: Control Flow Rates. If the design of the permanent Flow Control BMP was modified for temporary construction flow control purposes, the construction of the permanent Flow Control BMP must be finalized, as designed for its permanent function, at project completion.

Maintenance Standards

- Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the untreated stormwater stored in the holding pond or tank, backwash return to the untreated stormwater pond or tank may be appropriate. However, other means of treatment and disposal may be necessary.
- Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged.
- Sediment shall be removed from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.
- Disposal of filtration equipment must comply with applicable local, state, and federal regulations.

Appendix D

Site Inspection Form

Erosion and Sediment Control Inspection Form

Project Name			**NPDES Permit Number**
CESCL or Qualified Inspector Name		**Inspection Location**	
Date	**Time**	**Type of Inspection**	**Precipitation in last 24 hours**
Current Weather	☐ Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog		

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
1. **Mark Clearing Limits:** Are high visibility and perimeter fences in good condition? Are natural resource areas protected with barriers or similar BMPs?	☐ OK ☐ Not OK ☐ N/A	
2. **Construction Access Stabilized:** Is track-out of sediment prevented?	☐ OK ☐ Not OK ☐ N/A	
3. **Control Flow Rates:** Are flow rates causing erosion in pond, outlets, etc.?	☐ OK ☐ Not OK ☐ N/A	
4. **Install Sediment Controls:** Are sediment controls in place & functioning properly?	☐ OK ☐ Not OK ☐ N/A	

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
5. **Stabilize Soils:** Has bare soil been protected and is erosion prevented? Are stockpiles stabilized from erosion?	☐ OK ☐ Not OK ☐ N/A	
6. **Protect Slopes:** Have slopes been protected and is erosion prevented?	☐ OK ☐ Not OK ☐ N/A	
7. **Protect Drain Inlets:** Existing storm drains inlets are protected?	☐ OK ☐ Not OK ☐ N/A	
8. **Stabilize Channels & Outlets:** Are conveyances (channels & outlets) stabilized?	☐ OK ☐ Not OK ☐ N/A	
9**. Control Pollutants:** Are all pollutants handled & disposed of in a way that does not contaminate stormwater? Has secondary containment been provided?	☐ OK ☐ Not OK ☐ N/A	

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
10.**Control Dewatering/Water Management:** Is dewatering being done in compliance with the SWPPP? Were there any clean non-turbid dewatering discharges?	☐ OK ☐ Not OK ☐ N/A	
11.**Maintain BMPs:** Are all BMPs maintained to assure continued performance of their intended function?	☐ OK ☐ Not OK ☐ N/A	
12.**Manage the Project:** Has the SWPPP been updated, implemented and records maintained?	☐ OK ☐ Not OK ☐ N/A	
13.**Protect LID BMPs:** Are LID BMPs protected from sedimentation?	☐ OK ☐ Not OK ☐ N/A	
Describe water discharging from site, if present. Note any suspended sediment, “cloudiness,” discoloration, or oil sheen.		
This site is in compliance with the TESC and SPCC plans and the NPDES permit.	☐ OK ☐ Not OK ☐ N/A	

Corrective Action List				
Element #	**Description and Location**	**Action Required**	**Completion Date**	**Initials**

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

Inspected by: (Print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____



EXPLANATION

FORMER SNOW MOUNTAIN LOG MILL

APPROXIMATE EXTENT OF SOLID WASTE

PARCEL LINES FROM SKAGIT COUNTY

N

0 200 400

APPROXIMATE SCALE IN FEET

PROJECT LOCATION
Demolition Project
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 11/18/21	Project No. PS21204410
wood.		Figure 1

Plot Date: 11/18/21 - 11:37am, Plotted by: adam stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design-CoverSheet_092921.dwg

A

PADILLA BAY

5,125 sqft

146 sqft

452 sqft

3,505 sqft

9,300 sqft

783 sqft

187 sqft

1,286 sqft

1,408 sqft

2,162 sqft

35,625 sqft
(INCLUDES 9,300 sqft & 2,162 sqft)

FENCE GATE

OUTFALL

BNSF RAILROAD

APPROXIMATE EXTENT OF SOLID WASTE

MHT (EL. 10.27')

PADILLA BAY
INNER LAGOON

APPROXIMATE EXTENT OF SOLID WASTE

S MARCH POINT RD

MHT (EL. 10.27')

EXPLANATION

- MEAN HIGH TIDE AVERAGE (MHT)(EL. 10.27')
- STORMWATER SWALE
- APPROXIMATE EXTENT OF SOLID WASTE
- 25 — ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD

TOTAL SQFT = 48,517

0 75 150
APPROXIMATE SCALE IN FEET

DEMOLITION PLAN
Demolition Project
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 11/18/21	Project No. PS21204410
wood.		Figure 2

Plot Date: 11/18/21 - 8:15am. Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_Design_100521.dwg

A

PADILLA BAY

BNSF RAILROAD

APPROXIMATE EXTENT OF SOLID WASTE

MHT (EL. 10.27')

PADILLA BAY
INNER LAGOON

EXISTING ROADWAY

EXISTING ROADWAY

GATE

EXISTING CULVERT

FORMER OUTFALL

EXISTING OR NEW SILT FENCE

APPROXIMATE EXTENT OF SOLID WASTE

EXISTING CULVERT

EXISTING CULVERT

S MARCH POINT RD

MHT (EL. 10.27')

EXPLANATION

- LIMIT OF WORK (4.53 ACRES)
- PARCEL LINE
- MEAN HIGH TIDE AVERAGE (MHT)(EL. 10.27')
- STORMWATER SWALE
- APPROXIMATE EXTENT OF SOLID WASTE (15.7 ACRES)
- 25 — ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- SURFACE FLOW ARROW
- SILT FENCE
- CONTAINMENT BERM
- STORMWATER INFILTRATION AREA
- CONSTRUCTION ENTRANCE

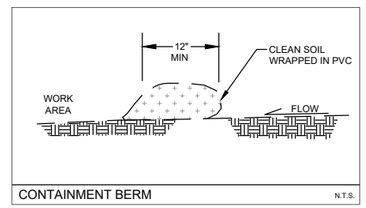
UTILITY LEGEND

- SS — SEWER DRAIN
- RD — ROOF DRAIN
- W — WATER LINE
- FIRE LINE
- P — POWER LINE

NOTES:

1. CAP ALL UTILITIES AND DRAINS AT THE GATE AND AT THE STRUCTURES.
2. PREVENT STORMWATER FROM LEAVING THE SITE.

0 75 150
APPROXIMATE SCALE IN FEET



CONTAINMENT BERM N.T.S.

TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC)
Demolition Project
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 11/18/21	Project No. PS21204410
wood.		Figure 3

Plot Date: 11/18/21 - 8:38am. Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design_100521.dwg

APPENDIX B
HERON
MANAGEMENT PLAN

Heron Management Plan

Whitmarsh Landfill Remediation and Shoreline Habitat Restoration Project
Anacortes, Washington
Skagit County

Wood Project # PS21204410.03

Prepared for:

Skagit County
Mount Vernon, Washington

February 17, 2022

Heron Management Plan

Whitmarsh Landfill Remediation and Shoreline Habitat Restoration Project
Anacortes, Washington
Skagit County

Prepared for:

Skagit County
Mount Vernon, Washington

Prepared by:

Wood Environment & Infrastructure Solutions, Inc.
4020 Lake Washington Blvd NE, Suite 200
Kirkland, Washington 98033
USA
T: 425-368-1000

Wood Project # PS21204410.03

February 17, 2022

Table of Contents

1.0 Introduction 1
1.1 Description of Site and Heronry 1
1.2 Background 2
1.3 Proposed Activities and Construction Schedule 2
1.3.1 Proposed Activities 2
1.3.2 Construction Schedule 3
1.3.3 2021 Vegetation Removal 3
2.0 Existing Conditions: Noise Monitoring 4
2.1 Sound Measurement Units 4
2.2 Noise Monitoring Methods 5
2.2.1 Noise Monitoring Periods 5
2.2.2 Noise Monitoring Locations 5
2.2.3 Sound Level Meter Deployment and Settings 5
2.2.4 Data Review and Processing 6
2.2.5 Sound Recordings 6
2.3 Noise Monitoring Results and Discussion 6
2.3.1 Observed Trends in Noise Level Metrics 7
2.3.2 Summary of Existing Noise Conditions 7
3.0 Existing Conditions: Biological Monitoring 8
3.1 Biological Monitoring Methods 8
3.2 Biological Monitoring Observations Summary 9
4.0 Construction Monitoring and Mitigation Plan 10
4.1 Construction Noise Modeling 10
4.2 Noise Monitoring 10
4.3 Equipment Noise Mitigation 11
4.4 Other Mitigation Measures 12
4.5 Biological Monitoring 13
4.5.1 Methods and Documentation 13
4.5.2 Significant Heron Disturbance 14
4.6 Biological Mitigation 15
4.7 Notifications and Reporting 15
5.0 References 16

List of Figures

Figure 1 Project Location
Figure 2 Construction Sequencing
Figure 3 Noise Monitoring Locations
Figure 4 Potential Heron Foraging Areas
Figure 5 Construction Noise Modeling Locations

List of Tables

Table 1: Approximate 2023 Construction Schedule
Table 2: Common Noise Environments
Table 3: Noise Monitoring Periods
Table 4: Average and Maximum Noise Levels during Daily Heron Occupancy Construction Window
Table 5: Recommended Allowable Noise Limits L_{eq} and L_{max} – Monitoring Periods 1 through 4
Table 6: Anticipated Construction Noise Levels
Table 7: Construction Equipment List and Estimated L_{max} Values

List of Appendices

Appendix A Site Photographs
Appendix B Development of Recommended Allowable Noise Limits
Appendix C Noise Monitoring Data Metrics
Appendix D 2021 Great Blue Heron Existing Conditions Biological Monitoring Summary and Data Tables
Appendix E Construction Noise Modeling
Appendix F March Point Heronry Behavioral Monitoring Log

Glossary

A-weighting: A method of processing measured sound to reflect how audible that sound is to people. The measured sound pressure in each frequency composing the sound is adjusted by a weighting factor to approximate human hearing sensitivity to that frequency.

A-weighted decibels (dBA): The most-commonly used measure of noise exposure among people, which uses a logarithmic scale (the decibel) to represent a wide range of sound pressure levels.

ambient noise levels: The level of noise arising from all sources, as measured at a location.

amplitude: The range representing the height (from peak to valley) of the waves that comprise sound at a given frequency (distance between peaks).

average (equivalent) sound level (L_{eq}): The constant sound level in a given time period that conveys the same sound energy as the actual time-varying sound.

background level: The constant equivalent A-weighted sound level that corresponds to the level which 90 percent of the sound levels exceed in the noise period measured.

decibels (dB): The sound level measured in decibels; a logarithmic scale that conveniently represents a wide range of pressure variation.

hertz (Hz): The frequency from peak to peak of sound waves (in cycles per second).

noise: The intensity, duration and character of sounds from any or all sources.

maximum sound level (L_{max}): The maximum sound level over a measurement interval determined by using a sound level meter set to "fast" response time.

octave band: An interval of the sound frequency spectrum, such that the center frequency of the octave band is at the logarithmic center of the frequency range for that band; the frequency spectrum is divided so that the upper limit of each band is twice the preceding center frequency. The commonly used center frequencies in octave band analysis are 63, 125, 250, 500, 1000, 2000, 4000 and 8,000 Hz.

1/3 octave band: A further subdivision of the sound frequency spectrum, such that each octave band is divided into three logarithmically-centered bands, where the center frequency is defined by 100.1N, where N is a whole number from 10 to 50.

sound: A wave-form disturbance of pressure propagating through a medium, such as the air.

sound level meter (SLM): An instrument for measuring sound levels that measures rapid variations in air pressure with time, using a microphone and signal processing electronics.

95 percent upper tolerance limit: the worst-case noise levels that are not exceeded more than 5 percent of the time, with 95 percent certainty.

List of Acronyms

dB	decibels
dBA	A-weighted decibels
$L_{2.5}$	noise level 2.5 percent of the time (1.5 minutes) out of one hour
L_{25}	noise level 25 percent of the time (15 minutes) out of one hour
L_{eq}	logarithmically averaged sound level
L_{max}	maximum sound level
SLM	sound level meter
Skagit County	Skagit County Solid Waste Division
SR	State Route
UTL_{95}	95 percent upper tolerance limit
WDFW	Washington Department of Fish and Wildlife
Wood	Wood Environment & Infrastructure Solutions, Inc.

1.0 Introduction

The Skagit County Solid Waste Division (Skagit County) requested Wood Environment & Infrastructure Solutions, Inc. (Wood) to prepare this Heron Management Plan for the remedial activities that Skagit County plans to conduct at the former Whitmarsh Landfill (the site), located in Anacortes, Washington (Figure 1), from May through November 2023, once the appropriate permits are issued. The objective of this plan is to establish allowable noise limits and propose monitoring and mitigation measures, if needed, for construction such that the great blue herons do not abandon the heronry. The following information is included in support of plan objectives:

- Existing conditions (site and March Point Heronry), including results of noise and biological monitoring conducted from April through July 2021 (during the great blue heron breeding season);
- Data analysis and determination of allowable noise levels for construction activities; and
- Recommendations for noise and biological observation monitoring and mitigation measures to maintain noise levels below the established allowable limits and limit overall disturbance to the heronry.

In this document, biological monitoring refers to observations of herons' behavior with respect to noise. The site is located within the 984-foot year-round buffer associated with the March Point Heronry, as established by the Anacortes Municipal Code 19.70.335.D.2.c.iv, dated December 13, 2021. Because it is located within the year-round buffer, the City of Anacortes requires preparation of a Heron Management Plan that addresses noise levels and protection of the heronry, consistent with the Washington Department of Fish and Wildlife (WDFW) Management Recommendations for Washington's Priority Habitats and Species – Great Blue Heron (Azerrad, 2012), per Anacortes Municipal Code 19.70.335.C.2.b.

1.1 Description of Site and Heronry

Whitmarsh Landfill: The site (delineated by a red line on Figure 1) is bordered by South March Point Road to the south and southwest, an active BNSF railway and Padilla Bay to the north and northeast, and the Swinomish Indian Reservation to the east and southeast (Figure 1). State Route (SR) 20 runs generally east/west approximately 800 feet southwest of the site beyond South March Point Road. The site is zoned as "Heavy Manufacturing" (City of Anacortes, 2019) and designated as Urban Shoreline (City of Anacortes, 2010). Adjacent land uses include the railway and a commercial steel fabrication facility at the T. Bailey property, which lies west of South March Point Road and the site. The Swinomish Indian Tribal Community has developed the area to the southeast of the site into a light industrial/commercial complex that includes a casino, hotel, RV campground, and fueling station. Additionally, the nearby Swinomish Channel is frequented by recreational boaters and fishermen. Due to the surrounding development and human activities, noise disturbance is typical and expected, including elevated noise from all forms of traffic (airplanes/helicopters, vehicles, trains, and boats), as well as nearby industrial activity.

March Point Heronry: The heronry is located south of the site and is bounded by South March Point Road to the north, the T. Bailey facility to the west, SR 20 to the south, and a variety of Salish Trust-owned properties to the east (Figure 1). Most of the properties on which the March Point Heronry is located are owned by the Skagit Land Trust. The heronry is elevated well above the site, on a fairly steep slope adjacent to South March Point Road (Figure 1 and Photos 1 and 2 in Appendix A). The heronry continues south over the top of the hill and down a gentler slope toward SR 20.

1.2 Background

The site was used as an informal public dump for solid waste from the 1950s until 1961, when Skagit County leased the property from the State of Washington to operate the site as a landfill. The County operated the landfill as a burn dump until approximately 1969 and then as a sanitary landfill until the landfill closed in 1973. At the time of closure, the landfill was covered with a 2- to 3-foot-thick layer of soil, consistent with the closure regulations at that time. A sawmill operated at the site from the late 1980s until approximately August 2011 on land partially owned by the sawmill and partially leased from Washington State Department of Natural Resources. At that time, wood waste up to 10 feet thick had accumulated over large portions of the landfill. In 2014, the Washington State Department of Natural Resources transported approximately 44,000 cubic yards of wood waste off site to a composting facility. Subsequently, Skagit County purchased the parcel of land near March Point Road previously owned by the sawmill operator.

Washington State Department of Ecology identified the site as a source that was releasing pollutants into Padilla Bay adjacent to the landfill via seeps on the shoreline. In 2007, the site was selected for remedial activities to minimize release of pollutants into Padilla Bay. A remedial investigation/ feasibility study was conducted on the site between 2008 and 2016. The proposed remediation measure selected for the site consisted of regrading and re-capping the landfill to meet the current standards for municipal landfills, in compliance with Washington Administrative Code 173-340.

The earliest known reporting of presence of herons within the wooded area across March Point Road to the south was in the mid-1950s. Since that time, herons have been present continuously and have increased in numbers to become the largest heronry in Washington. The State of Washington and the City of Anacortes have identified this heronry as a conservation area, requiring preparation of a Heron Management Plan for activities within the 984-foot buffer.

1.3 Proposed Activities and Construction Schedule

1.3.1 Proposed Activities

The proposed remedial activities will consist of:

- Clearing the vegetation on site, removing trees growing above the waste, and demolishing the structures and concrete slabs on site.
- Excavating the waste at the edges of the landfill and stockpiling the excavated soil near the middle of the landfill, to minimize the final landfill footprint and create a mound in the middle to promote future stormwater runoff away from the landfill. Along the Padilla Bay shoreline, the work will include removing the waste and flattening the shoreline slope so that the landfill footprint will be the same and the final slopes exposed to the bay will be stable in the long run, without the use of riprap.
- Grading and compacting the material moved toward the center of the site to create a stable base and a gradual, positive slope away from the landfill toward the perimeter.
- Constructing a multi-layer landfill cap system, consisting of sand to collect and vent landfill gas, a geosynthetic clay liner to minimize stormwater infiltration into the waste, a layer of sand and layer of crushed rock to drain the stormwater, and a cover of topsoil and sand on the shoreline up to the ordinary high tide line.
- Planting shrubs on the shoreline to create 1.6 acres of new habitat for wildlife and hydroseeding the entire landfill.

- Installing monitoring wells for groundwater and landfill gas monitoring, a perimeter access road of crushed rock around the landfill, and a perimeter security fence to control access.

During construction, groundwater collection and treatment will be necessary to control discharges into Padilla Bay. The earthwork specifically requires working during the dry months to minimize discharge of construction stormwater into Padilla Bay and to allow the excavation and capping on the shoreline to be conducted during low tides that occur in the mornings during the dry months (approximately late May through early September).

1.3.2 Construction Schedule

Table 1 and Figure 2 present the anticipated construction earthwork schedule in 2023 and the typical stages of the breeding season.

The proposed construction period partially coincides with the heron breeding season, which in general starts in mid-February and ends in late August (Azerrad, 2012). While this suggests that the fledging period ends at the end of August, the time frame can be variable and has commonly been recorded around the end of July for the March Point Heronry, according to Skagit County Land Trust observations.

The tasks generating the highest noise levels, as listed in the first bullet in Section 1.3.1, will include the use of chainsaws to cut trees and breakers to demolish concrete slabs. These tasks have been scheduled for late summer and early fall, outside of the heron breeding season. Site clearing and tree cutting were mostly completed in fall of 2021 and demolition is scheduled for later in 2022, after the end of the heron breeding season.

To minimize potential disturbance to the herons, construction sequencing is proposed in relation to the heron breeding season (Table 1 and Figure 2). Earthwork along the landfill edge at the northwest corner near the site entrance is planned to start in May (during earlier stages of the breeding season but after the courtship period); this is the part of the site furthest from the heronry. Earthwork will then proceed in a clockwise direction to the east, south, and west. Earthwork along the shoreline will begin during the low tides starting in June and be complete in late July, when work will be closest to the heronry but the breeding season will be furthest along. The majority of work activities on areas where taller vegetation was removed (across from the T. Bailey facility on the western portion of the site) will occur after the breeding season ends (Figure 2).

The work will be sequenced in a clockwise direction, according to the breeding season. This will keep the site work furthest from the heronry during the courtship and egg laying stages. As work gets closer to the heronry, the herons will be in the brooding and hatching stage, when adults are least likely to abandon their nests. Furthermore, as the earthwork along the shoreline approaches the south side of the site (and March Point Road), the existing trees will offer a visual barrier to the construction activities from the heronry, thus further minimizing possible impact to the herons.

1.3.3 2021 Vegetation Removal

Site clearing and tree cutting were largely completed during the fall of 2021 (outside the heron breeding season). Removed trees were all located within the site limits. Approximately 80 to 90 percent of the trees removed were estimated to be less than 4 inches diameter at breast height and under 6 feet tall (see Photos 2, 3, and 5 in Appendix A). The remainder of the removed trees ranged between 4 and 12 inches diameter at breast height and were located in the middle of the site, along the shoreline, and along the approximate extent of the solid waste adjacent to South March Point Road. Of these larger trees, most were located within the center of the site and along the shoreline, where they presented little visual screening from the heronry. However, a select number of trees along the southwestern side of the site

adjacent to South March Point Road were also removed (see Photos 5 and 6 in Appendix A). Given the relatively short stature and small diameter of most of the removed trees, they likely did not provide significant visual screening of the site from the heronry. Therefore, significant changes to line of sight from the heronry are not anticipated to have occurred from the vegetation removal completed to date.

2.0 Existing Conditions: Noise Monitoring

Wood measured and analyzed ambient noise levels at three monitoring locations in the vicinity of the March Point Heronry during the spring and summer of 2021, i.e., during the breeding season when herons occupy the site. The locations are shown in Figure 3 and represent the potential ambient noise levels at the nearest heronry perimeters southeast and southwest of the landfill along South March Point Road, and at one of the available local forage areas along Padilla Bay to the northeast. The focus of the measurements and analyses was to document the existing ambient noise environment during the breeding season. Ambient noise includes noise from all sources audible at a given location.

Monitoring was planned to measure noise levels during six rounds of noise level monitoring for seven consecutive days at all three locations, supplemented by an automatic short audio recording when clearly elevated noise levels occurred. The resulting noise data was analyzed to characterize the hourly-average noise levels at each location, including statistical noise level descriptors consistent with the Washington State noise standards for acceptable noise impacts on receiving properties. A statistical analysis of this data was used to establish the upper limits of normal ambient noise levels at the March Point Heronry. These limits represent the current level of noise that the herons are accustomed to and tolerate well, as can be deduced from their current breeding success at the heronry.

When possible, the gathered data was used to define how the herons responded to fluctuations in the noise environment. The objective of the existing conditions analysis was to establish criteria to be adhered to by Wood and others while performing site management activities for the Whitmarsh Landfill and surrounding properties.

2.1 Sound Measurement Units

Sound in a physical sense is a rapid fluctuation in ambient air pressure versus a reference level, transmitted through the air by spherical wave propagation. As the variations in air pressure become larger (the waves increase in amplitude), a sound increases in loudness. The loudness is measured in decibels (dB), a logarithmic scale that conveniently represents a wide range of pressure variation. Typical levels of some common sounds are shown in Table 2.

Ambient noise levels vary continuously with time. As various sources of noise occur, the ambient noise level is louder at some times, and quieter at others. Statistical descriptors have been developed to describe this variation. The maximum sound level (L_{max}) is the highest sound level recorded, including instantaneous sounds that last only milliseconds. The average (equivalent) sound level for any time interval (such as a minute or an hour) is the logarithmically averaged sound level (L_{eq}) over that time interval. Note that because perceived noise levels actually represent a very wide range of sound pressures, decibel mathematics are done in a logarithmic scale to correctly calculate and interpret noise data. The L_{eq} and other statistical values define the percentage of time that exceeds a specific sound level. For example, over the course of an hour, noise levels may be above a relatively quiet level 25 percent of the time (15 minutes) or may exceed a relatively loud level only 2.5 percent of the time (1.5 minutes), expressed as the L_{25} and $L_{2.5}$, respectively.

In general, the degree of a perceived noise impact depends, among other factors, on existing ambient sound levels versus the noise source in question, the frequency spectrum of the noise source, the timing and duration of the noise event, and the hearing abilities of the person (or wildlife) listening.

2.2 Noise Monitoring Methods

2.2.1 Noise Monitoring Periods

Continuous noise data was collected during six one-week noise monitoring periods that occurred over the six-month breeding season (Table 3). The monitoring weeks were divided between the two major heron nesting stages:

- Stage 1: courtship and pre-brooding (approximately February to May); and
- Stage 2: hatchling and young fledgling (approximately June through July).

Monitoring periods were randomized within each major nesting stage, except the week of the Fourth of July holiday was deliberately selected as one of the six monitoring periods, to take into consideration the associated annual celebratory and traffic sources of noise that might have otherwise been missed.

2.2.2 Noise Monitoring Locations

The heron population nesting area occupies several parcels in the wooded area southwest of Whitmarsh Landfill and north of SR 20. The critical nesting habitat for the herons includes portions of the following parcels (Figure 1):

- P104357 and P19765, owned by the Skagit Land Trust,
- P19763, owned by the Salish Trust,
- P19684, owned by the Charles Moon Credit Trust and M. Ellen Moon Trustee, and
- Portions of Parcels P19675, P19677, and P19675, owned by Quattro Properties LLC.

Wood installed sound level meters (SLMs) at the three noise monitoring sites shown on Figure 3. These sites were selected to represent varied sound exposure from local sound sources to which the March Point Heronry is exposed. The sites were approved by the Skagit Land Trust, Skagit County, and the Washington State Department of Ecology. During Monitoring Period 5, which included the Fourth of July holiday, the SE location was moved further east to a fourth location (Figure 3) to document the potentially higher noise levels over that weekend.

2.2.3 Sound Level Meter Deployment and Settings

Noise recordings were made using SLMs manufactured by Larson Davis, Model 831C. Each SLM was housed in an environmental case with a remote microphone positioned on a tripod at a height of approximately 5 feet above ground level. Each microphone was fitted with a manufacturer-approved wind screen with bird spikes. SLMs were calibrated before and after each monitoring period using a Larson Davis Cal 200. Equipment was left unattended for the entirety of the seven-day deployment except to change out batteries after three to four days.

For each monitoring week, each SLM was programmed to collect:

- L_{eq} and L_{max} (both A-weighted decibels [dBA] and fast response) in time intervals of one hour;
- L_{25}, $L_{8.3}$, and $L_{2.5}$ in time intervals of one hour, as per Washington Administrative Code Chapter 173-60-040;
- Spectral analysis in terms of 1/3 octave band analysis for the one-hour L_{eq} metric;
- Sound time histories for the all the above statistical metrics with a one-second resolution; and

- Audio recording of high sound level events that exceeded a trigger level of 10 dB above the background sound level at the time of the event.

2.2.4 Data Review and Processing

Sound level data collected were downloaded to a computer using processing software (LD G4 Utility) specific to the Larson Davis instruments. Once downloaded, the data was then exported to a spreadsheet format for further processing, tabulation, and review. During review, faulty data was identified and excluded. Methodology and justification for data selection and inclusion is discussed in Appendix B.

A primary objective of noise monitoring was to characterize the ambient noise environment to which the herons are accustomed. However, during Monitoring Periods 5 and 6 (in July) herons were no longer observed at the March Point Heronry. Possible reasons for the absence of the herons are discussed in Section 3.0. However, historically herons have remained in the area through the end of July. Due to the relocation of one SLM location for Monitoring Period 5, and absence of the herons during both Monitoring Periods 5 and 6, it was determined that only Monitoring Periods 1 through 4 would be valid as representative of the heronry during their occupancy. In addition to being most representative, these periods are also considered to be conservative because they do not include periods that typically have excessive noise such as the Fourth of July. Therefore, the sound levels only from the first four monitoring periods were used for evaluation. Further explanation of the statistical analysis and justification can be found in Appendix B. The L_{eq}, L_{max}, L_{25}, $L_{8.3}$, and $L_{2.5}$ were tabulated from the collected data for each monitoring location and the data are presented in Appendix C.

2.2.5 Sound Recordings

SLMs at monitoring locations were configured to capture audio recordings of sound level events that were at least 10 dB above background levels. On average, approximately 15 recordings were captured per hour of monitoring and typically lasted from five to 20 seconds in duration. Tables D-1 through D-9 in Appendix D summarize the distinguishable sound sources during the time the biological team was on site observing heron behavior.

2.3 Noise Monitoring Results and Discussion

Sections 2.3.1 through 2.3.3 discuss the observed trends, noise sources, and modeling for the noise monitoring. Where exceedance statistics are mentioned, these refer to sound levels that were above the allowable hourly exceedances of noise levels established under the Washington State environmental noise regulations found in the Washington Administrative Code Chapter 173-60. Those regulations aim to control noise impacts between properties, though most of the sound sources identified in this ambient monitoring are exempt from these regulations. Though WAC 173-60 does not apply to the majority of sound sources in the ambient environment and construction work at the March Point Landfill, Wood measured and tabulated the allowable exceedance data metrics (L_{25}, $L_{2.5}$, and $L_{8.3}$) to put the existing conditions and future noise impacts in context.

A qualitative review of the loudest captured sound recordings (L_{max} greater than 90 dBA) found that fireworks, particularly around the Fourth of July, were the loudest sources of noise. Other observable frequent sources of loud noises were motorcycles, loud vehicles, train horns (especially for the nearby foraging site) and aircraft.

Wood conducted a qualitative review of sound sources for times where there was a high L_{eq}. In general, the highest sound sources during these periods were a combination of multiple sources, which usually included loud motor vehicles or aircraft, bird chirping, and other wildlife activity. Secondary sources

observed included train horns, backup alarms, and metal clanking, which was believed to come from the T. Bailey operation and abandoned buildings on the landfill site during periods of high wind.

2.3.1 Observed Trends in Noise Level Metrics

The hourly average (L_{eq}) and the L_{25}, $L_{8.3}$, and $L_{2.5}$ for every hour throughout each monitoring period, as well as box plots of this data, can be found in Appendix C. The tables and box plots in Appendix C show that the highest L_{eq} and statistical exceedances occurred between 6:00 and 7:00 a.m. for Noise Monitoring Sites SE and SW, near the nesting area. Sound levels and exceedance statistics tended to drop afterward and slowly rise throughout the day until about 5:00 to 6:00 p.m. After 6:00 p.m. there was another gradual drop until 4:00 a.m., after which sound levels rose again until 7:00 a.m.

Replay of the sound recordings triggered by noise increases above background showed that the main sound sources from 6:00 to 7:00 a.m. were a combination of traffic sound and bird activity. Though not directly tallied, it was apparent that there is increased motor vehicle traffic on the nearby roads during the early morning and early evening hours, consistent with nearby commuter and industrial activity. The traffic, along with increased bird vocalization activity, are the key factors in the noticeable noise level increase between 6:00 and 7:00 a.m. Though louder noises were recorded throughout the day from trains and aircraft, the loudest average noise levels originated from the commuter motor vehicle traffic on South March Point Road.

Box plots of the L_{eq}, and noise statistics for Noise Monitoring Site NE in the foraging area (Appendix C) show lower overall noise levels and a more stable trend of sound throughout the day than those closer to the nesting areas. This confirms the traffic noise domination of the sound environment at the heronry.

2.3.2 Summary of Existing Noise Conditions

The loudest source of instantaneous noise events (L_{max}) was the discharge of fireworks near the Fourth of July weekend. The loudest L_{max} captured for the entirety of the noise monitoring was 121 dBA, which occurred on July 5 at 12:49 a.m. As discussed in Section 2.2.4, only sound recordings from the first four monitoring periods were used for evaluation and are discussed in this report. The available information for all six monitoring periods is presented in Appendix C.

The key objective of the baseline noise monitoring was to define the noise levels to which the herons are accustomed at this successful heronry location, particularly the levels they currently tolerate between 6:00 a.m. and 7:00 p.m., which generally defines the daily limit of proposed remedial construction activities on Whitmarsh Landfill. To that end, the large amount of hourly and daily data was narrowed down to the first four monitoring periods when the heronry was occupied, between 6:00 a.m. and 7:00 p.m.

2.3.2.1 Ambient Noise Conditions During Heron Occupancy

Table 4 presents the average L_{eq} and L_{max}. during the daily construction window during Monitoring Periods 1 through 4 (as defined in Table 3). Though these measurements do not account for the hourly variability and loudest peak (instantaneous) noises, the calculated averages provide an estimate of the ambient sound levels to which herons were accustomed in 2021.

2.3.2.2 Upper Noise Tolerance Limits

The 95 percent upper tolerance limit (UTL_{95}) is defined as the worst-case noise levels that are not exceeded more than 5 percent of the time, with 95 percent certainty. The UTL_{95} was calculated for two key noise metrics, the hourly L_{max} and hourly L_{eq}. The L_{max} measurement reported in Tables C-1 through C-3 in Appendix C is the highest one-second L_{max} over the entire one-hour period measured. The L_{eq} in these tables is the sound level averaged over the indicated hour. Wood's analysis presents the UTL_{95} as the

upper noise limits that the herons presently tolerate during construction hours when they are in residence at the heronry. Wood recommends that the UTL_{95} of the collected sound measurements be used as the defined allowable noise limits for remedial construction activities.

The calculated UTL_{95} values for the L_{eq} and L_{max} metrics represent our recommended limit for allowable hourly noise levels at the March Point Heronry (Table 5). Wood also recommends that the maximum L_{max} should be the maximum "do not exceed" limit at any time during the construction window when herons are present. However, although the 1-second maximum noise levels at the heronry sites on occasion exceeded it, Wood recommends adhering to the 92 dBA maximum noise level guideline adopted by WDFW for heronries, be used at the heronry boundary.

3.0 Existing Conditions: Biological Monitoring

The purpose of the existing conditions biological monitoring was to characterize great blue heron behavior in their ambient noise environment. The pre-project monitoring occurred during the same periods as the noise monitoring, from April to July 2021, in order to establish baseline conditions that could be used to determine whether increased response to disturbance would occur due to upcoming planned construction activities at the Whitmarsh Landfill. A detailed summary of the monitoring and results is provided in Appendix D.

3.1 Biological Monitoring Methods

Each period consisted of monitoring over a block of time during two different days of that week, producing a total of twelve monitoring periods completed over the full course of the biological monitoring. Observations occurred for a total of three hours each day, broken into two equal periods focused on both the heronry and lagoon foraging site.

Only Monitoring Periods 1 through 4 were analyzed for the apparent impact of surrounding noise and visual events on the herons, as they were not observed at the March Point Heronry after July 3. Possible reasons for the heron absence include:

- Aggressive eagle predation following hatching;
- A region-wide heat wave[1] stressing the chicks or adults;
- The region-wide heat wave coupled with minus tides in Padilla Bay affecting foraging;
- Human disturbance (people entering heronry during the nesting season; firework discharges, a drone flying low etc.); and/or
- Some combination of the above.

In response to this absence, a Wood biologist searched nearby areas and found juvenile and adult herons using Fidalgo Bay to the northwest (Figure 4). The other known foraging sites identified in the surrounding area could have been available to the herons as well. A Skagit Heron Foraging Study identified these sites based on feeding concentrations of great blue herons observed over multiple seasons (https://wildlifeconservationtrustpnw.org/herons/). Many of the sites are located near the March Point Heronry and within the ranges identified by WDFW (Azerrad, 2012) as those used by most great blue heron colonies for foraging: 3 kilometers for colonies with less than 100 nests and 10 kilometers for colonies with 100 nests or more. This includes what appears to be the largest concentration of herons

1. A record heat wave occurred across the region for approximately four days (June 25 through June 28) directly after the last day of Monitoring Period 4. Daily high temperatures recorded for this duration exceeded the average high temperature for the area. (https://www.accuweather.com/en/us/anacortes/98221/june-weather/2253970?year=2021).

observed during the foraging study, which is located within Padilla Bay a short distance north of the Whitmarsh Landfill.

3.2 Biological Monitoring Observations Summary

For this analysis, only perceived reactions involving flushing and/or circling were included, since those behaviors could be considered more indicative of a potential response to a disturbance than other observed behaviors (i.e., vocalizations of brief duration). Observers recorded a total of 272 unique noise or visual events and 67 total perceived reactions, although a unique event could not be specifically identified for 35 of those perceived reactions. For the events that could be identified, the herons exhibited perceived response behavior at a rate of 11.8 percent (32 total perceived reactions to 272 total events). A summary of perceived reactions and noise or visual events recorded is provided in Table D-1 of Appendix D.

Events that appeared to elicit the highest rate of reactions included unknown/unidentified events (52.2 percent) and avian predator presence (22.4 percent). The remaining events eliciting perceived reactions included avian predator vocalizations (7.5 percent), noise from the neighboring T Bailey facility (7.5 percent), people walking/talking (3 percent), aircraft (1.5 percent), boats (visual only) (1.5 percent), helicopters (1.5 percent), motorcycles (1.5 percent), and semi-trucks (1.5 percent). Many of these events can be classified as either a noise or visual event, or a combination of the two. Also, of the 272 events, there were 32 when no clear response behavior was observed; these instances occurred for seven event types; boat horns/engines, facility alarms/sirens (from area industry other than the T Bailey site), general traffic, vehicle horns, emergency vehicle sirens, trains/train horns, and wind.

Most heron behaviors were observed in and around the heronry itself, with few observations of flushing and/or circling at the foraging site. Observations recorded at the foraging site more frequently involved use of the lagoon area north of the railroad tracks and closer to the islands located within Padilla Bay than to the lagoon area south of the railroad tracks or even the Whitmarsh Landfill site itself. Overall, the herons appeared to react less frequently during recorded noise or visual events while using the foraging site than the heronry, apart from disturbances from avian predators like bald eagles. Herons flushing from the northern lagoon area generally flew towards the heronry or northwest towards Fidalgo Bay, where another known foraging area is located. For the lagoon area closest to the site, there was only one instance observed of a small group of herons taking flight. This instance may have been simply standard nesting behavior by the herons, as they flew towards the heronry carrying nesting material.

As shown by these results, the March Point Heronry experiences multiple types of sudden noise and visual events throughout the day and night, including from traffic (South March Point Road), Swinomish Channel, military jets, commercial and small airplanes, and helicopters), trains/train horns, and surrounding industrial facilities. The heronry also experiences continuous noise and visual activity from various sources such as SR 20, local roads, and surrounding industrial facilities, as well as seasonal events like the Fourth of July fireworks from the nearby Swinomish Reservation. Large-scale behavioral reactions to these events seemed limited to those loudest activities that also included movement near the heronry, such as air traffic in proximity to the heronry. The most recorded source of apparent disturbance from an identifiable event was from the presence of avian predators such as bald eagles and red-tailed hawks. There were also several behaviors observed where no noise or visual event was identified, as well as noise events recorded where no apparent response behavior was observed.

In an environment with events occurring simultaneously and/or repeating on a regular basis, combined with potential simultaneous reactions of various types by individuals or groups of herons, it can be difficult to record all information thoroughly at all times. For example, the number of events identified may be underrepresented for specific event types, such as industrial noise from the T. Bailey facility and traffic. These events tended to persist throughout the entire monitoring period, and therefore may not

have been recorded for all instances, depending on the circumstances of the monitoring period. Also, in the case of behaviors observed where no event was identified by the observer, it is reasonable to assume that the herons could have been reacting to something that was out of the viewpoint or hearing range of the observer or that what was observed was general behavior not in response to any particular event of interest, or possibly reactions to other herons. This is especially probable considering the elevated audible and line-of-sight vantage point of the herons, uphill from the observers and within the tree canopy.

While it's likely that not all noise or visual events were recorded, as possibly evidenced by the unknown/ unidentified events responsible for 52.2 percent of the perceived responses, 46 unique noise events were recorded from the T. Bailey facility (backup alarms and general industry noise) and only five perceived reactions (involving flushing and/or circling) to these noise events were observed. Given the similarities between the T. Bailey facility noise and the noise anticipated from construction activities at the Whitmarsh Landfill, a similar level and rate of reactions could be anticipated to occur during the remediation and associated construction noises on the landfill site. The construction will produce an increase in visible activity on the site. As described in Section 1.3, the proposed construction has been sequenced taking into account the heron breeding season and considering the visual screening capability of remaining vegetation to minimize potential disturbance. Based on the size, quantity, and location of most of the removed trees, visibility of the site from the heronry is anticipated to be similar to that which existed prior to the 2021 clearing activities. Based on these two considerations and the other data presented from the noise and biological monitoring completed in 2021, a monitoring and mitigation plan to be implemented during construction, including biological monitoring focused on noise and visual disturbance, is presented in Section 4.0.

4.0 Construction Monitoring and Mitigation Plan

4.1 Construction Noise Modeling

The proposed construction activity closest to the heronry during the breeding season would be the earthwork on the edge of the landfill at the south swale (Figure 5). The demolition activities were not included in the modeling, since that work is scheduled to be completed outside of the breeding season in December 2021. The anticipated activities and equipment and associated noise levels when the landfill remediation work is closest to the heronry during the breeding season were used to model the anticipated noise levels that would be expected to reach the monitoring points on the south side of South March Point Road. The modeling revealed the anticipated construction noise levels with all anticipated equipment operating at the same time, will be within the allowable noise limits as shown in Table 6. The complete modeling results are included in Appendix E.

4.2 Noise Monitoring

The noise levels and the herons' reaction will be monitored during construction activities while the heronry is occupied. Wood recommends the calculated allowable noise limits listed in Table 5 and summarized below should be used as a boundary limit for allowable noise levels at the March Point Heronry during the construction.

Nesting area (SE and SW monitoring sites) allowable noise levels from construction noise sources are as follows:

- Hourly L_{eq} should not exceed 63.6 dBA more than 5 percent of the time;
- Maximum hourly L_{max} should not exceed 85.8 dBA more than 5 percent of the time; and

- Maximum one-second fast response L_{max} measurement should not exceed 92 dBA (to be consistent with WDFW recommendations for nesting areas).

The details of the monitoring and reporting are discussed in this section. It should be noted that the foraging area has not been included, due to the proposed construction activities along the shoreline and because alternate foraging locations in the surrounding area are available to the herons.

The proposed construction activities are planned to begin as early as April and last through November. Wood recommends the following noise monitoring be conducted during the heronry occupancy (February through July):

- Periodic construction noise monitoring at multiple areas along accessible areas of the heronry boundary when construction equipment is operating for the remedial work at the landfill site. On-site noise monitoring should include the following sound level measurements:
  - Roving monitoring of the L_{max} (one-second duration) and L_{eq} noise measurements along the heronry boundary to capture instantaneous noises and average sound levels, respectively.
  - Construction-period noise monitoring at designated locations along the nesting area boundary to capture hourly metrics. To achieve this, a stationary SLM will be placed at a location near the heronry and a roving SLM will be utilized around the construction activities. The noise monitoring locations for hourly metrics should be the same as the baseline monitoring locations or should be based on the latest observed location of heron activity and planned construction activity. They also should be selected to represent the impacts on the observed location(s) of heron activity relative to the planned construction activity each day.
  - Construction-period noise monitoring using SLMs from Monday to Friday at the SE and SW baseline monitoring locations at the heronry boundary, with subsequent evaluation of data to characterize noise metrics at the site for comparison with the results from the 2021 existing conditions monitoring.
- Supplemental noise monitoring should be conducted if a change in site conditions or utilized equipment could lead to levels above the recommended allowable noise limit at the heronry boundary, or if levels at the heronry boundary are found to be above the recommended allowable noise limits.

4.3 Equipment Noise Mitigation

The project goal is to avoid noise impacts at the heronry that exceed the upper tolerance limits of noise for the herons summarized in Table 5.

Table 7 lists equipment expected to be used at the Whitmarsh Landfill and their average maximum noise levels at 50 feet.

These are standard data representing noise emissions from actual in-use construction equipment prior to the cited report. Actual construction equipment noise levels are frequently lower than these data, but these values and the associated numbers of equipment and expected positioning were used in a noise modeling effort (Figure 5) to predict the potential worst-case impacts on the heronry. The results of the noise modeling are included in Appendix E.

The modeling found that the maximum noise levels at Noise Monitoring Sites SE and SW along the heronry boundary would not exceed an L_{max} of 69 dBA at the SE site, and 62 dBA at the SW site. Because these levels are well below the UTL_{95} for the heronry, it is expected that the remedial construction activities will not adversely affect the heron's success in continued utilization of the heronry. However, the

following mitigation measures may be utilized if the noise generated reaches the maximum allowable levels:

- Conduct the perimeter construction activities in clockwise direction starting at the site entrance, so that the majority of the perimeter work closest to the heronry will be conducted later in or after the breeding season;
- Stage heavy equipment at points furthest from heron nesting areas.
- Implement a no-idling policy.
- Operate at a steady rate to minimize equipment power demands and reduce the associated engine revving, when possible.
- Install more efficient engine exhaust silencers.
- Apply sound dampening material and sound absorption layers to vibrating panels and covers.
- Limit run times to reduce hourly sound level averages.
- Limit the number of trips across the site and the number of pieces of equipment running at the same time.
- Avoid tracked equipment. If tracked equipment must be used, avoid driving over surfaces that may create higher noise levels, such as concrete, pavement, and packed gravel.
- Install modified/ambient sensitive backup warning devices or use backup observers on all vehicles/heavy equipment.
- Require well-maintained bed liners for all trucks performing import/export haul. Bed liners dampen noise from materials that are loaded and unloaded from the truck bed.
- Ensure truck loading methods involve careful placement of material in the beds versus dropping the material from higher distances.
- Prohibit truck tailgate banging. All truck tailgates shall be secured to prevent excessive noise from banging.

Some of these mitigation measures could also be used to address concerns regarding potential visual disturbance due to construction activities.

Noise mitigation techniques for generators/pumps/other small equipment are as follows:

- Locate equipment within a sound dampening enclosure;
- Install more efficient engine exhaust silencers; and
- Apply sound dampening material and sound absorption layers to vibrating panels and covers.

4.4 Other Mitigation Measures

Other mitigation measures to eliminate, reduce, and/or avoid significant disturbance and adverse impacts to the herons could include:

- Locate on-site activities as far away from the heronry and heron activity (including the lagoon) as practical by scheduling activities to accommodate their breeding season patterns.
- Exclude/limit the portion of South March Point Road next to the heronry as a site access/haul route to the extent practicable. Direct haul routes and site traffic (workers, vendors, etc.) to/from the north and northwest, away from the portion of South March Point Road adjacent to the heronry.

- Avoid louder work activities on windy, cool, or rainy days to the extent practical.
- Prevent loud noises and refrain from large equipment moves during large vocalizations (chortles/clucks) by the herons and/or observed disturbances to the colony by predator activity (bald eagles, red-tailed hawks, etc.).
- If lighting is needed, use covered and down-shielded lights and direct away from the heronry, foraging areas, and existing trees on the project site.
- Produce a schedule for periodic monitoring, and a contingency plan with corrective actions if conservation or mitigation actions do not lead to a desired outcome as recommended by Azerrad (2012).

4.5 Biological Monitoring

Biological monitoring is proposed following the recommendations in Azerrad (2012), as part of the Heronry Management Plan requirements (Anacortes Municipal Code 19.70.335.C.2.b). The purpose of biological monitoring is to detect any significant behavioral changes in the herons that result from noise or visual disturbances from construction activities and confirm that the recommended allowable construction noise does not adversely affect the herons during their nesting period. Biological monitoring during construction will be limited to heron behavior and implemented concurrent with the noise monitoring. Observers will be present on site during mutually agreed-upon designated portions of the noise monitoring efforts to detect behavioral changes in the herons resulting from specific disturbance. Disturbance is a human activity that changes the contemporaneous behavior or physiology of one or more individuals within a breeding colony and can include visitor activities surrounding the nesting area and vehicle activities (road, boat, and air traffic) through, near, and over the heronry (Nisbet, 2000).

Biological monitoring will be performed during staging and site setup activities and throughout the entirety of the first week of earth-moving construction. Biological monitors will be on site to observe the herons and ensure there are no adverse behaviors observed. Afterwards, biological monitoring will be reduced to once per week during construction. The once-a-week biological monitoring will be scheduled to coincide with planned noise measurements and changes occurring on the site, such as changes in construction activities, when new equipment or multiple pieces of equipment will be in use (generating a potential change in noise level and/or general activity level), or when there is a change in the proximity of work to the heronry. Frequency of biological monitoring can be reevaluated if there are indications that the herons are responding negatively to work activities.

4.5.1 Methods and Documentation

Each biological observation monitoring period will begin at the start of the work day (e.g., 6:00 a.m.) before construction activity occurs, yet late enough for heron reactions to disturbances to be readily observable. The biological monitor will be positioned at a location where several occupied heron nests are visible without changing vantage location or positioning. Observation locations will be maintained unless work activities require relocation. For monitoring during construction, the contractor will provide information regarding the types of activities and equipment that will be operating that day (this information can be transmitted for a week at a time). The monitor can use this information to determine the best day and vantage point for monitoring.

Activities on the site that could potentially disturb the herons will be monitored. Throughout the observation period, the biological monitor will make note of any behaviors that could indicate disturbance, which could include:

- Audible chortles or clucks, which could indicate early stage or low level of disturbance;

- Audible screams/sharp cries, which could indicate late stage or high level of disturbance;
- Adults flushing from nests (with duration of time from flush to nest return recorded); and
- Herons circling nests from above.

Using a standard data form (Appendix F), the biological monitor will record observations at a minimum of every 10 minutes. This ensures monitoring continues without long periods of interruption. Herons will be observed using a spotting scope or binoculars.

As shown in Figure 4 and described in Section 3.1, other forage areas in proximity to the March Point Heronry besides the tidal flats adjacent to the Whitmarsh Landfill are available. Therefore, while the main focus of the biological monitoring is reaction activity from the heronry, data also will be recorded periodically for the foraging monitoring site.

Data also will be recorded for events that occur without a perceived reaction from the herons. For example, if an excavator is operating at the construction site and the herons do not appear to react to the activity (both sound and visual), this shall be recorded as shown in the chart below:

Time	Activity	Response Code	Number of Herons
1210	LF/E/S/V	N/N	0

Abbreviations:
E = equipment
LF = landfill
N = none
S = sound
V = visual

If there is a response to equipment, for example, an excavator on the construction site drops the bucket onto the ground making a loud noise and two herons flush from their nest to adjacent trees, but then return within one minute, a new entry line would read:

Time	Activity	Response Code	Number of Herons
1215	LF/E/S/V/IN	FL/RE (1)	2

Abbreviations:
E = equipment
FL = flush
IN = instantaneous noise
LF = landfill
RE = return
S = sound
V = visual

This indicates that the instantaneous noise flushed two herons, but both returned to the heronry within one minute.

Further information can be provided in the notes section of the data form to identify the equipment, activity being performed, location on the project site, and proximity to the heronry; to clarify recorded data; to record changes in conditions; and/or to note other species within the monitoring area.

4.5.2 Significant Heron Disturbance

Certain behavioral responses to disturbance are of concern because they have potential to cause reproductive failure (nest abandonment and loss of eggs and/or young). The effects of brief flushes from the nest may not be adverse unless prolonged enough to result in loss of eggs or chicks (e.g., through reduced egg incubation and opportunistic predation) or metabolic costs to a parent.

For the Whitmarsh Landfill project, the following shall be considered a significant heron disturbance:

- Multiple herons exhibiting distress and/or abnormal nesting behaviors, including:
  - Excessive vocalization (distress calls);
  - Excessive agitation; or
  - Excessive circling.
- A large-scale flush event (e.g., more than 25 herons) with a prolonged absence from the nest (more than three minutes).

These are considered significant behavior changes and disturbance requiring notification and possible contingency actions.

4.6 Biological Mitigation

During construction, if monitoring or other verifiable observation reveals a significant heron disturbance, appropriate contingency actions to mitigate the disturbance shall be implemented immediately. If contingency actions cannot be implemented immediately, halt the disturbance-causing activity until the contingency actions can be implemented.

The aspect of construction suspected of causing the significant heron disturbance shall be suspended for the time recommended by the biological monitor (i.e., until behaviors normalize, etc.) or until contingency actions can be implemented to mitigate the disturbance.

If the significant heron disturbance appears to coincide with a noise or other disturbance event not related to site construction activities or there is evidence that behavior is in response to predator activity, then monitoring should continue and construction activities could proceed with caution, based on recommendations by the biological monitor. If heron behaviors do not normalize, then construction should be suspended, or other contingency actions should be implemented to mitigate site noise and disturbance in order to reduce these additional potential disturbances to the herons.

Additional contingency actions may include the following:

- Immediate suspension of activities suspected of causing disturbance until such time as mitigation has been implemented;
- Increased frequency of the monitoring events;
- Extension of the monitoring period;
- Alteration of construction activities or schedule;
- Change in use of equipment and/or schedules to minimize disturbance; and
- Modifications to construction equipment.

4.7 Notifications and Reporting

If noise or biological monitoring reveals significant disturbance to the herons from construction, including any significant cumulative effect on the herons (i.e., increased agitation in response to disturbance identified through data analysis), the information will be presented immediately to the site superintendent/foreman, the Project Manager, and the Skagit County Project Manager to immediately implement appropriate contingency actions in order to mitigate the disturbance. Notifications will include the time, disturbance, response, and the likelihood of repeated response to the same disturbance based on the monitor's judgement. The biological monitor should not abandon monitoring activities until the birds' behaviors have

normalized. All parties involved will agree on an immediate and near-term course of action to mitigate the disturbance and prevent repeated disturbance. Skagit County representatives or their designee will be responsible for reporting information to the Washington State Department of Ecology or other State and local agencies as needed.

The data will be reviewed regularly to help assess whether the monitoring protocol is effective and to elicit questions or suggestions for ongoing activities to help create an adaptive approach to the monitoring efforts.

Monitoring results will be discussed in the weekly progress calls/meetings. Monthly reports will be provided to Skagit County in memorandum format. Results will include summary noise data collected, frequency of disturbance and response patterns and compared to available sound data.

5.0 References

Azerrad, J. M. 2012. Management recommendations for Washington's priority species: Great Blue Heron. Washington Department of Fish and Wildlife, Olympia, Washington.

City of Anacortes. 2010. Official Shoreline Environments Designation Map, City of Anacortes, Washington. Shoreline Master Program.

City of Anacortes. 2019. City of Anacortes Zoning Map. Codified by Ordinance 3040.

Nisbet, Ian C. T. 2000. Disturbance, Habituation, and Management of Waterbird Colonies. *Waterbirds* 23(2): 312-332.

U.S. Environmental Protection Agency. 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. 550/9-74-004. Office of Noise Abatement and Control.

Washington State Department of Transportation (WSDOT). 2020. *Biological Assessment Preparation Manual*.

Figures



EXPLANATION

FORMER SNOW MOUNTAIN LOG MILL

APPROXIMATE EXTENT OF SOLID WASTE

PARCEL LINES FROM SKAGIT COUNTY

N

0 200 400

APPROXIMATE SCALE IN FEET

PROJECT LOCATION
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/11/22	Project No. PS21204410
wood.		Figure 1

Plot Date: 02/11/22 - 1:25pm, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design-CoverSheet_011022.dwg

PADILLA BAY

MAY 1-15, 2023

MAY 15-31, 2023

EXISTING ROADWAY

EXISTING ROADWAY

GATE

EXISTING CULVERT

REGRADING:
MAY THROUGH AUGUST
CAPPING:
AUGUST THROUGH SEPTEMBER

APPROXIMATE EXTENT OF SOLID WASTE

BNSF RAILROAD

PADILLA BAY
INNER LAGOON

JUNE 1-15, 2023

JUNE 15-30, 2023

WATER TREATMENT:
MAY THROUGH SEPTEMBER

GROUNDWATER
EXTRACTION TRENCH

AUGUST 1-15, 2023

JULY 1-15, 2023

JULY 15-31, 2023

NOISE MONITORING SITE: SW

EXISTING CULVERT

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

MONITORING POINTS ALONG PROPERTY LINE

HERONRY
NESTING
AREA

STATE ROUTE 20

EXPLANATION

- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL)
  (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE
  (15.3 ACRES)
- GROUNDWATER EXTRACTION TRENCH
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- HERONS BREEDING SEASON
- OUTSIDE HERONS BREADING SEASON

0 75 150
APPROXIMATE SCALE IN FEET

CONSTRUCTION SEQUENCING
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/15/22	Project No. PS21204410
wood.		Figure 2

Plot Date: 02/15/22 - 10:48am, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\WoodWhitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_012822.dwg

PADILLA BAY

NOISE MONITORING SITE: N

APPROXIMATE EXTENT OF SOLID WASTE

BNSF RAILROAD

PADILLA BAY
INNER LAGOON

EXISTING ROADWAY

EXISTING ROADWAY

P19713

GATE

P19687

EXISTING CULVERT

P19712

P19676

SWINOMISH INDIAN TRIBAL LANDS

PARCEL#:
P19677
QUATTRO
PROPERTIES
LLC

PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC

P19761

P19684

NOISE MONITORING SITE: SW

EXISTING CULVERT

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

PARCEL#:
P104357
SKAGIT LAND
TRUST

MONITORING POINTS ALONG PROPERTY LINE

NOISE MONITORING SITE: SE ALTERNATE

HERONRY
NESTING
AREA

PARCEL#:
P19684
MOON CHARLES
CREDIT TRUST &
M ELLEN MOON
TRUSTEE

PARCEL#: P19763
SALISH TRUST

PARCEL#:
P19763
SALISH
TRUST

PARCEL#:
P19765
SKAGIT
LAND
TRUST

PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC

STATE ROUTE 20

EXPLANATION

- PARCEL LINE
- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD

NOTE:

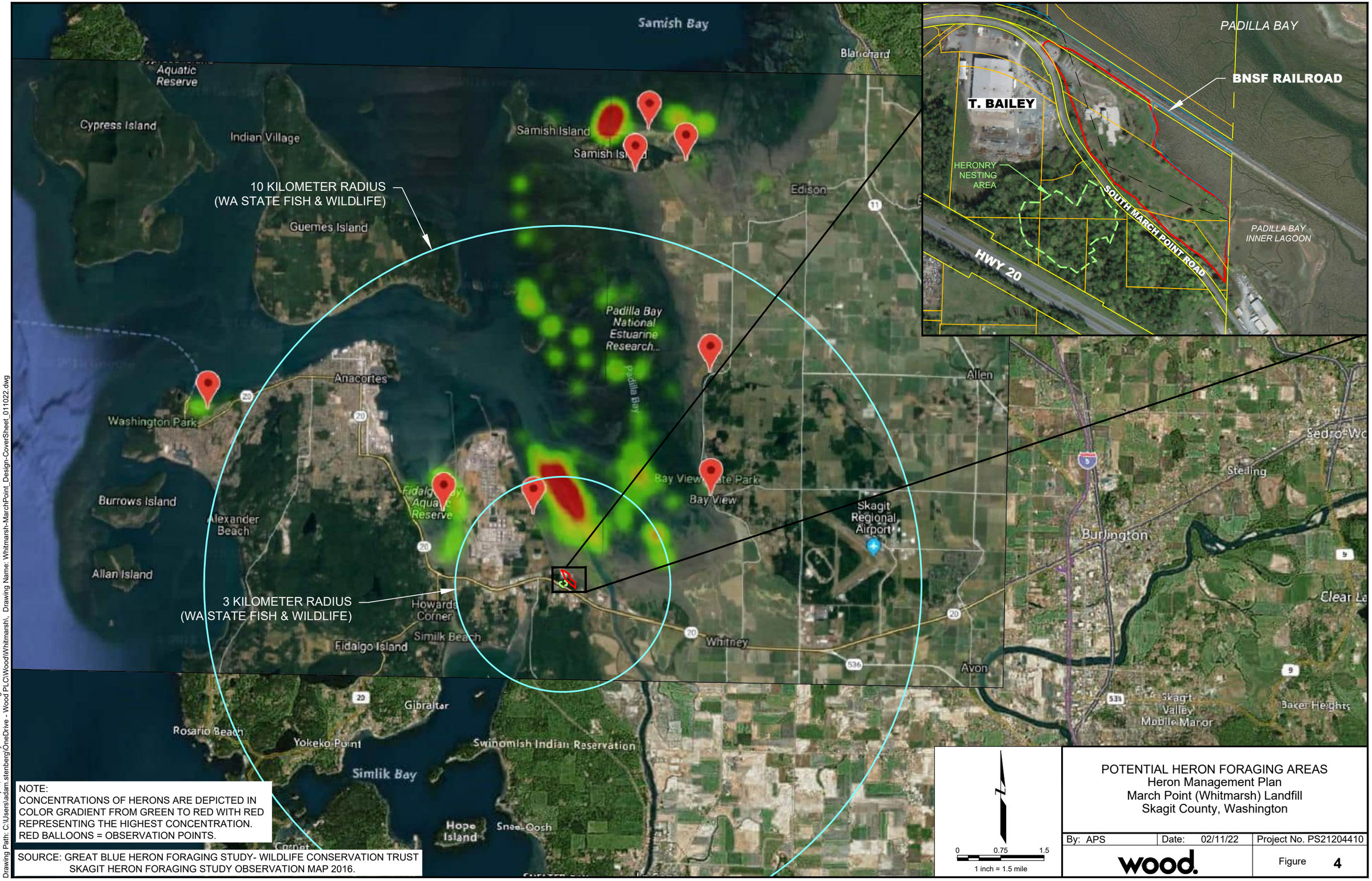
1. THE PROPOSED NOISE MONITORING POINTS ARE APPROXIMATE AND MAY CHANGE. ADDITIONAL LOCATIONS MAY ALSO BE CONSIDERED BY WOOD.

0 75 150
APPROXIMATE SCALE IN FEET

NOISE MONITORING LOCATIONS
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/11/22	Project No. PS21204410
wood.		Figure 3

Plot Date: 02/11/22 - 2:16pm Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design_012822.dwg



NOTE:
CONCENTRATIONS OF HERONS ARE DEPICTED IN COLOR GRADIENT FROM GREEN TO RED WITH RED REPRESENTING THE HIGHEST CONCENTRATION. RED BALLOONS = OBSERVATION POINTS.

SOURCE: GREAT BLUE HERON FORAGING STUDY- WILDLIFE CONSERVATION TRUST SKAGIT HERON FORAGING STUDY OBSERVATION MAP 2016.

0 0.75 1.5
1 inch = 1.5 mile

POTENTIAL HERON FORAGING AREAS
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/11/22	Project No. PS21204410
wood.		Figure 4

Plot Date: 02/11/22 - 2:18pm Plotted by: adam stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design-CoverSheet_011022.dwg

PADILLA BAY

STAGING AREA GENERATOR 5kva

EXISTING ROADWAY

EXISTING ROADWAY

GATE

EXISTING CULVERT

APPROXIMATE EXTENT OF SOLID WASTE

BNSF RAILROAD

PADILLA BAY
INNER LAGOON

DELIVERY TRUCK

DOZER

DUMP TRUCK

TREATMENT AREA WITH PUMPS

GROUNDWATER EXTRACTION TRENCH

SWINOMISH INDIAN TRIBAL LANDS

EXCAVATOR

JULY 15-31, 2023

232

S MARCH POINT RD

NOISE MONITORING SITE: SW

EXISTING CULVERT

NOISE MONITORING SITE: SE

EXISTING CULVERT

MONITORING POINTS ALONG PROPERTY LINE

HERONRY NESTING AREA

STATE ROUTE 20

NOTE:

FIGURE SHOWS CONSTRUCTION ZONE CLOSEST TO THE HERONRY DURING THE HERONS' BREEDING SEASON.

EXPLANATION

- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- GROUNDWATER EXTRACTION TRENCH
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- CONSTRUCTION ZONE

0 75 150

APPROXIMATE SCALE IN FEET

CONSTRUCTION NOISE MODELING LOCATIONS
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/16/22	Project No. PS21204410
wood.		Figure 5

Plot Date: 02/16/22 - 9:45am, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_012822.dwg

Tables

Table 1: Approximate 2023 Construction Schedule

Whitmarsh Landfill Heron Management Plan, Anacortes, WA

No.	Task	March		April		May		June		July		August		September	
		1st	Mid	1st	Mid	1st	Mid	1st	Mid	1st	Mid	1st	Mid	1st	Mid
1	Mobilization														
2	Site Setup				X										
Refuse Excavation and Grading[1]															
3	Northwest (Site Entrance)					X	X								
4	North (along BNSF Tracks)						X								
5	Northeast							X	X						
6	East								X						
7	Southeast									X					
8	South (Swale)										X				
9	Southwest (Swale)											X	X		
10	Water Treatment					X	X	X	X	X	X	X	X		
11	Waste Grading						X	X	X	X	X	X	X		
12	Gas Venting System									X	X	X	X	X	
13	GCLL Capping							X	X	X	X	X			
14	GCL Capping								X	X	X	X	X	X	
15	Ditch Construction											X	X		
16	Placement and Grading Cover Soil								X	X	X	X	X		
17	Topsoil Import and Placement											X	X	X	
18	Hydroseeding													X	
19	Plants													X	
20	Perimeter road													X	
21	Security Fence													X	
22	Demobilization													X	X
Heronry Breeding Stage[2]		Pre-nesting, Courtship				Egg Laying, Incubation		Brooding		Large Active Young		Fledging		Non-Breeding	

Notes:

1. Intertidal zone, averging 50 to 60 linear feet per work day.
2. Approximate breeding stage schedule for heronry from Azerrad (2012). The end of the breeding season is variable, typically considered to occur between late July and mid August. Observations by the Skagit Land Trust for the March Point Heronry indicate fledgling period often ends around the end of July.

Table 2: Common Noise Environments
Whitmarsh Landfill Heron Management Plan, Anacortes, WA

Typical Noise Environment	Sound Pressure Level (dB)	Typical Noise Environment	Sound Pressure Level (dB)
Jet aircraft takeoff at 100 feet	120	Conversational speech	60
Motorcycle at 25 feet	90	Television at 10 feet	55
Heavy truck at 50 feet	85	Typical office	50
Garbage disposal	80	Living room	40
City street corner	70	Quiet bedroom at night	30
Large store	65	NA	NA

Source: U.S. Environmental Protection Agency (1974).

Abbreviations
dB = decibels
NA = not applicable

Table 3: Noise Monitoring Periods
Whitmarsh Landfill Heron Management Plan, Anacortes, WA

Monitoring Period	Nominal Start Date & Time	Nominal End Date & Time	Hours of Continuous Noise Data Collected per Site[1, 2]
1	4/9/2021 2:30 p.m.	4/15/2021 3:00 p.m.	145.5
2	4/29/2021 1:00 p.m.	5/7/2021 12:00 p.m.	190
3	5/28/2021 12:00 p.m.	6/4/2021 1:00 p.m.	171
4	6/18/2021 11:00 a.m.	6/25/2021 11:00 a.m.	169
5[3]	7/2/2021 11:00 a.m.	7/9/2021 1:00 p.m.	172
6	7/23/2021 10:00 a.m.	7/30/2021 11:00 a.m.	170

Notes
1. All three sound level meters ran out of battery power before the end of the first deployment period. Subsequent monitoring periods included a battery replacement visit after three to four days of deployment. Continuous monitoring was briefly interrupted by battery replacements.
2. The sound level meter at the southeast monitoring location failed to record any measurements past May 7, 2021, during Monitoring Period 2 or before May 28, 2021, during Monitoring Period 3.
3. The southeast sound level meter was deployed at a location further east on South March Point Road to the alternate location, for Monitoring Period 5, to represent worst-case noise impacts from traffic and nearby fireworks sales and discharges.

Table 4: Average and Maximum Noise Levels during Daily Heron Occupancy Construction Window
Whitmarsh Landfill Heron Management Plan, Anacortes, WA

Noise Monitoring Site	Average L_{eq} [1]	Average L_{max} [1]	Number of Hourly Measurements
SE (Nesting Area)	58.5	79.4	281
SW (Nesting Area)	59.9	80.2	364
NE (Foraging Area)	48.2	67.6	359

Note
1. Average (arithmetic mean) L_{max} and L_{eq} were calculated from data collected from Monitoring Periods 1 through 4 (see Table 3), between 6:00 a.m. and 7:00 p.m, reported in decibels.

Abbreviations
L_{eq} = average (equivalent) sound level
L_{max} = maximum sound level
NE = northeast
SE = southeast
SW = southwest

Table 5: Recommended Allowable Noise Limits L_{eq} and L_{max} – Monitoring Periods 1 through 4
Whitmarsh Landfill Heron Management Plan, Anacortes, WA

Results reported in dBA

Noise Monitoring Site	L_{eq}[1]		L_{max}[1]		Number of Hourly Measurements
	Allowable Limit	Max Recorded	Allowable Limit	Max Recorded	
SE (Nesting Area)	63.6	64.6	86.2	97.6[2]	281
SW (Nesting Area)	64.9	66.1	85.8	97.6[2]	364
NE (Foraging Area)	56.1	62.3	82.4	94.1	359

Notes
1. UTL and maximum L_{max} and L_{eq} were calculated from data collected from Monitoring Periods 1 through 4, between 6:00 a.m. and 7:00 p.m.
2. Although the 1-second maximum noise levels at the heronry sites exceeded it, Wood recommends adhering to the 92 dBA maximum noise guideline adopted by Washington Department of Fish and Wildlife for the heronry boundary.

Abbreviations
dBA = decibels
L_{eq} = average (equivalent) sound level
L_{max} = maximum sound level
NE = northeast
SE = southeast
SW = southwest

Table 6: Anticipated Construction Noise Levels
Whitmarsh Landfill Heron Management Plan, Anacortes, WA
Results reported in dBA

Noise Monitoring Site	Allowable Limit (L_{max} , UTL_{95})	Anticipated L_{max} Construction Noise
SE (Nesting Area)	86.2	69
SW (Nesting Area)	85.8	62
NE (Foraging Area)	82.4	56

Note:
1. The results are based on all equipment operating at the same time.

Abbreviations
L_{max} = maximum sound level
NE = northeast
SE = southeast
SW = southwest
UTL_{95} = 95 percent upper tolerance limit

Table 7: Construction Equipment List and Estimated L_{max} Values
Whitmarsh Landfill Heron Management Plan, Anacortes, WA
Results reported in dBA

Equipment Description	L_{max} at 50 feet
Backhoe	84
Backup/Movement Alarm	80
Dump Truck	91
Excavator	87
Flatbed Truck	81
Pick Up Truck	75
Generator (5KVA)	73
Trash Pumps	74

Source: Chapter 7.0, Construction Noise Impact Assessment, of the *Biological Assessment Preparation Manual* (WSDOT 2020).
Abbreviations
KVA = volt amps
Lmax = maximum sound level

Appendix A

Site Photographs

Appendix A. Site Photographs



Photo 1 View west from the Swinomish Casino & Lodge toward the approximate location of the March Point Heronry (in red) and the Whitmarsh Landfill (in yellow), showing the general elevated position of the trees/nests within the heronry compared to the landfill. Photo taken prior to vegetation removal.



Photo 2 View southeast from the Whitmarsh Landfill toward the March Point Heronry, showing the general elevated position of the trees/nests within the heronry compared to the landfill. Photo taken prior to vegetation removal.



Photo 3 Whitmarsh Landfill prior to vegetation and tree removal. View toward the northeastern half of the project site and the March Point Heronry. Note the short stature and small diameter of the vegetation present on the landfill.



Photo 4 Whitmarsh Landfill post-vegetation and tree removal. Photo taken near Photo 3 location, view toward the northeastern half of the project site and the March Point Heronry. Much of the tall vegetation along South March Point Road, between the landfill and the heronry, remains.



Photo 5 Whitmarsh Landfill prior to vegetation and tree removal. View toward T. Bailey facility (white building in background) and the western half of the project. Note the tall trees in front of the T. Bailey facility but behind the landfill, along South March Point Road.



Photo 6 Whitmarsh Landfill post-vegetation and tree removal. View toward the western half of the project site and the T. Bailey facility. Note the remaining tall trees in front of T. Bailey (compare to Photo 5).



Photo 7 Whitmarsh Landfill post-vegetation and tree removal. View toward the southwestern half of the project site. Note the remaining tall trees and vegetation (right side of photo) between the site and heronry.

Appendix B

Development of Recommended Allowable Noise Limits

Appendix B – Development of Recommended Allowable Noise Limits

B.1 Introduction

This appendix summarizes the Wood Environment & Infrastructure Solutions, Inc. (Wood) review of potentially applicable noise regulations and the use of noise monitoring data from the heronry area to establish existing conditions, and then summarizes those existing conditions to develop recommended allowable noise limits that the herons appear tolerant of during the nesting season.

B.2 Review of Existing Regulations

There are two sources of noise impact criteria in Washington State: one is established by the Washington State Department of Ecology to regulate the impacts of a noise source on receiving properties, and the other is a recommended guideline from the Washington Department of Fish and Wildlife (WDFW) to protect migratory bird species.

B.2.1 Washington State Department of Ecology Regulations

B.2.1.1 Washington Administrative Code 173-60 Criteria

Washington Administrative Code (WAC) Chapter 173-60 establishes maximum permissible environmental noise levels at receiving property boundaries. The established maximum permissible noise levels in WAC 173-60-040 depend on the environmental designation for noise abatement (EDNA) for both the property that produces the noise source and the receiving property. There are three EDNA designations:

- Class A EDNA – Residential zones, which also include such areas as campgrounds and parks;
- Class B EDNA – Commercial zones, typically including areas that contain community services, commercial dining, and retail services; and
- Class C EDNA – Industrial zones.

Wood has used the definitions found in WAC 173-60-030 to designate the March Point Heronry as a Class A EDNA and the March Point Landfill as a Class C EDNA. Table B-1, taken from WAC 173-60-040, presents the maximum permissible noise level for property limits.

Table B-1: Maximum Permissible Environmental Noise Levels
March Point Heronry Management Plan, Anacortes WA
Noise Levels in dBA

EDNA of Nosie Source	EDNA of Receiving Property		
	Class A	Class B	Class C
Class A	55	57	60
Class B	57	60	65
Class C	60	65	70

Source: U.S. Environmental Protection Agency (1974).

Abbreviation(s)
dBA = A-weighted decibels
EDNA = environmental designation for noise abatement

In addition, WAC 173-60-040 provides for the following:

- Between the hours of 10:00 p.m. and 7:00 a.m., the noise limitations shown in Table B-1 shall be reduced by 10 A-weighted decibels (dBA) for a receiving property within Class A EDNAs.
- At any hour of the day or night, the applicable noise limitations in Table B-1 or in the bullet above may be exceeded for any receiving property by no more than:
  - 5 dBA for a total of 15 minutes in any one-hour period; or
  - 10 dBA for a total of 5 minutes in any one-hour period; or
  - 15 dBA for a total of 1.5 minutes in any one-hour period.

B.2.1.2 Washington Administrative Code 173-60 Exemptions

The exemptions to WAC 173-60-040 listed in WAC 173-60-50 include the following;

- WAC 173-60-50 (3) - The following shall be exempt from the provisions of WAC 173-60-040, except insofar as such provisions relate to the reception of noise within Class A EDNAs between the hours of 10:00 p.m. and 7:00 a.m.:
  - Sounds originating from temporary construction sites as a result of construction activity; and
  - Sounds originating from forest harvesting and silvicultural activity.
- WAC 173-60-050 (4) - The following shall be exempt from all provisions of WAC 173-60-040:
  - Sounds created by motor vehicles when regulated by Chapter 173-62 WAC;
  - Sounds originating from aircraft in flight and sounds that originate at airports that are directly related to flight operations;
  - Sounds created by surface carriers engaged in interstate commerce by railroad;
  - Sounds created by warning devices not operating continuously for more than five minutes, or bells, chimes, and carillons;
  - Sounds created by safety and protective devices where noise suppression would defeat the intent of the device or is not economically feasible;
  - Sounds created by emergency equipment and work necessary in the interests of law enforcement or for health safety or welfare of the community;
  - Sounds originating from motor vehicle racing events at existing authorized facilities;
  - Sounds originating from officially sanctioned parades and other public events;
  - Sounds emitted from petroleum refinery boilers during startup of said boilers, provided that the startup operation is performed during daytime hours whenever possible;
  - Sounds created by the discharge of firearms in the course of hunting;
  - Sounds caused by natural phenomena and unamplified human voices; and
  - Sounds created by motor vehicles, licensed or unlicensed, when operated off public highways except when such sounds are received in Class A EDNAs.

B.2.1.3 Washington Administrative Code 173-60 Applicability

The noise sources for most of the sounds that dominate the existing ambient noise environment at the March Point Heronry are listed exemptions in WAC 173-60-050(4) and (5). Temporary construction is also

exempt from these regulations per 173-60-050(4)(a) during the hours of 7 a.m. to 10 p.m. With the main exception of six days of shoreline construction that must occur at extreme low tides which occur in the early morning hours in 2022, the noise-producing construction activities at the March Point Landfill are not expected to occur before 7 a.m. or after 10 p.m.

Though WAC 173-60 does not apply to the majority of sound sources in the ambient environment and construction work at the March Point Landfill, Wood measured and tabulated the allowable exceedance data metrics (L_{25}, $L_{2.5}$, and $L_{8.3}$) to put the existing conditions and future noise impacts in context.

B.2.2 Washington Department of Fish and Wildlife Recommendations and City of Anacortes Municipal Code

The federal Migratory Bird Treaty Act of 1918 protects certain migratory bird species, including great blue herons. In Washington State, great blue herons are classified as protected wildlife and as a Priority Species. Heron nesting habitat is considered Priority Habitat, with protection provided through local city and county wildlife habitat or critical area ordinances. WDFW can advise local governments how to best protect heron colonies through consultation and Priority Species Management recommendations (Azerrad, 2012).

The WDFW management recommendations for the great blue heron include year-round buffers of various distances based on the percent-built environment within a quarter mile of a nest colony, as well as a seasonal buffer zone of 656 feet from "unusually loud activities." Unusually loud activities are defined as sounds exceeding 92 decibels when the sound reaches the outer boundary of the nesting colony. The recommended buffer zone should be established during the breeding season from February to September. The 92-decibel recommendation is used in the Heron Management Plan as the "do-not exceed" maximum noise level for the nesting areas.

For the March Point Heronry, the Anacortes Municipal Code 19.70.335, dated December 13, 2021, requires the 656-foot seasonal buffer width mentioned above for unusually loud activities during the breeding season. The Anacortes Municipal Code also sets a year-round buffer width of 984 feet; this is equivalent to the WDFW-recommended buffer width for nesting colonies located in an undeveloped setting (0–2 percent built within a quarter mile of the nest colony). Proposed developments within 1,000 feet, or that are likely to affect the colony, require a habitat management plan that follows, at a minimum, the guidelines provided by WDFW's recommendations.

B.3 Development of Noise Impact Recommendations

As described in the report, data collection was performed six times for seven consecutive days of 24-hour noise measurements during randomly-selected weeks within the heron breeding period. During each round, ambient noise was measured, and sounds recorded with Type 1 sound level meters (SLMs) at three primary sites (two along the heronry boundary and one near Padilla Bay to represent the nearest heron foraging area). For the week that included the Fourth of July weekend, Noise Monitoring Site SE along the heronry boundary was moved east to a fourth site, representative of the forested area potentially suitable for heronry habitat but nearer to the Swinomish Casino, to assess the effect of potential holiday traffic and celebration noise. These data were reviewed, summarized, and analyzed to arrive at recommended noise limits that the herons appear to tolerate during the breeding season.

B.3.1 Data Completeness Review

An external battery pack containing eight D-cell batteries was used to power the SLM during the monitoring periods. Based on guidance from the SLM manufacturer, the external power was initially expected to last the duration of the monitoring period. The first monitoring period was planned to last seven continuous days from April 9 to16; however, after demobilizing the equipment, it was found that

the battery power failed for all three instruments between April 14 and 15, resulting in a sampling duration for each that ranged from five to six days, rather than all seven days. Consequently, Monitoring Periods 2 through 6 included a battery change-out on the fourth or fifth day to ensure a complete seven-day sampling period.

During Monitoring Periods 2 and 3 (April 29 to May 7 and May 28 to June 4, 2021), the SLM located at Noise Monitoring Site SE failed to capture seven consecutive days of data. The SLM did not record any measurements before May 3 during Monitoring Period 2 or before May 28 during Monitoring Period 3. When Wood staff performed battery change-outs, the SLM was found to be off and was turned back on and set to record the remainder of the monitoring period. The cause of this failure has not been determined. These issues resulted in a relatively minor reduction in the number of hours of data collection for some of the sites.

B.3.2 Corrupt Data

A review of the data for Monitoring Period 2 (April 29 to May 7, 2021) showed that some of the periods had been affected by instrument setting or electrical faults (as indicated by momentary static and octave band overloads or impossible results for key data markers). Thus, a review and filtering of the data was necessary to identify and exclude the affected data. The review process was implemented based on three methods of detection of potentially affected data:

- The first method used was to filter out data recorded during calibration activities and any data below the SLM noise floor (which was lowered to eliminate this problem);
- The second method used was to filter out any missing data likely caused by a data buffer overload situation, represented in the data files by values of -99 dB or blank entries; and
- The third method used was to filter any data that has a significant difference between LAS_{max} and LAF_{max}, which corresponds with a possible data buffer overload that was characterized by momentary static in the noise recordings.

The review process identified data that were clearly unrepresentative. Aside from an hour each for two SLMs that were inadvertently left in calibration mode, the data affected typically consisted of a few to a few dozen seconds of an hour during this week of data. These periods of time were therefore removed from the 1-second time history and the hourly metrics were re-calculated. Review of subsequent monitoring periods found occasional rare occurrences of static noise recordings and octave band overloads. The data were removed from the 1-second time history and the metrics re-calculated as needed.

The Wood noise staff worked with Larson Davis support team to find the cause of the faulty data and octave band overloads. The SLMs were adjusted to automatically save the data locally to the SLM, in order to reduce the amount of data that was being stored in the data buffer of the SLM before it was saved at the end of the seven-day monitoring periods. This change eliminated further recurrence of the faulty data and octave band overload issues for subsequent monitoring periods.

B.3.3 Monitoring Periods Representing Existing Conditions

With the validated data, further analysis was conducted to determine whether the ambient noise conditions when herons had finished their occupancy were different than the prior periods when they were mating and raising their young. A statistical difference in the measured sound metrics between the periods with and without herons present would indicate the latter noise environment may not be representative of the environment herons are accustomed to. Hourly data was used to individually compare Monitoring Periods 5 (July 2 to July 9) and 6 (July 23 to July 30), when herons had dispersed

from the heronry versus Monitoring Periods 1 through 4, when they were occupying it and raising their young.

A nonparametric statistical test was utilized to compare the two sets of data, because the overall data did not follow a particular distribution (additional non-measured factors such as diurnal traffic and human activity clearly influence the overall noise levels). The nonparametric statistical test is appropriate for such conditions (USEPA, 2013).

Results of this test showed that the noise metrics for both Monitoring Periods 5 and 6 were statistically different (i.e. louder) from Monitoring Periods 1 through 4. Therefore, it is appropriate and conservative to exclude the noise levels during non-occupancy periods from the data used to establish the herons' upper tolerance limit for noise.

Overall review of the data showed that average Monitoring Period 5 sound measurements were louder than those for Monitoring Periods 1 through 4. This is likely due to fireworks and Fourth of July traffic and activities. Monitoring Period 6 sound metrics were found to be on average lower than the Monitoring Period 1 through 4 metrics, which may be due to decreased wildlife and bird activity, and could also reflect changes in weather patterns (less rain and wind).

Monitoring Period 6 data was therefore not included in the data to calculate the heron's upper tolerance limit for noise and the associated maximum values. Monitoring Period 5 data, representing the Fourth of July holiday week, was used to separately calculate statistical descriptors for a presumed worst-case sound exposure scenario.

B.3.4 Time Periods Selected

Remediation construction activities at the March Point Landfill are expected to be performed on only six days any earlier than 6:00 a.m., and none are expected after 7:00 p.m. in the evening. Therefore, only hourly metrics (L_{eq} and L_{max}) during expected work time hours were used to calculate statistical descriptors of tolerated noise during remedial construction time frames.

B.3.5 Wind Speed Data

WAC 173-58 establishes standardized procedures for the measurement of environmental noise. WAC 173-58 states that ambient environmental noise should not be collected when wind speeds exceed 12 miles per hour. Wind speed data was collected from a nearby weather station owned and maintained by the National Estuarine Research Reserve System. The weather station is located near the coast on the Padilla Bay Farm at the Padilla Bay Reserve. Wind speed data from the station is reported every 15 minutes. The four measurements taken every hour were averaged to calculate the average windspeed for a given hour during monitoring periods. The calculated hourly wind speed is presented in Appendix C.

Though there were several instances where the wind speed did exceed the 12 miles per hour limit, the data for these times was still retained, since it was representative of the ambient environment that herons are commonly exposed to at the heronry.

B.4 Calculation of the Upper Tolerance Limit of L_{eq} and L_{max}

The 95 percent upper tolerance limit (UTL_{95}) is a statistical estimate of an upper bound on the reasonably worst-case noise levels (95th percentile value), with a certain level of confidence (95 percent confidence). The UTL_{95} accounts for the inherent variability in sound levels throughout the monitoring periods. In this instance the UTL_{95} for L_{max} estimates the L_{max} noise level that one would not expect to be exceeded more than 5 percent of the time in a given hour. Similarly, the UTL_{95} for the L_{eq} estimates the upper bound for the hourly average sound level that would not be expected to be exceeded more than 5 percent of the

time by any future hourly average L_{eq}. The UTL is commonly used in many applications, including determining an upper confidence limit for background environmental data values (USEPA, 2013).

The most common way to estimate the UTL_{95} is to use a distributional model for the collected data. Data distribution models can be tested for a goodness of fit in a multitude of methods. The Wood noise staff utilized statistical computing software that follows U.S. Environmental Protection Agency guidance in finding appropriate distribution models for calculating statistical descriptors for environmental data. Based on the guidance, Wood determined that the distributions for all L_{eq} and L_{max} data sets did not follow a parametric distribution model; therefore, the UTL_{95} was estimated assuming a nonparametric distribution for the data.

The UTL_{95} was calculated for two key noise metrics, the hourly L_{max} and hourly L_{eq}, as shown in Table B-2. The L_{max} measurements reported in Appendix C were the highest 1-second L_{max} over each 1-hour period measured. The L_{eq} in the same tables is the sound level averaged over the indicated hour. The UTLs for these values, and the maximum values observed are presented below.

Table B-2: Maximum and Upper Tolerance Limit of L_{eq} and L_{max}
March Point Heronry Management Plan, Anacortes, WA

Results reported in dBA

Noise Monitoring Site	L_{eq}		L_{max}		Number of Hourly Measurements
	UTL	Maximum Recorded	UTL	Maximum Recorded	
SE (Nesting Area)	63.3	64.6	86.7	98.4	347
SW (Nesting Area)	63.5	66.1	86.1	97.6	448
NE (Foraging Area)	56.4	62.9	83.9	94.7	443

Note(s)
1. UTL and Maximum L_{max} and L_{eq} were calculated from data collected during Monitoring Periods 1 through 4, between 6:00 a.m. and 10:00 p.m.

Abbreviation(s)
L_{eq} = average (equivalent) sound level measured over a one-hour period
L_{max} = maximum sound level measured on fast response for 1-second duration
NE = northeast
SE = southeast
SW = southwest
UTL = upper tolerance limit

B.5 Instantaneous Maximum Noise Levels

The loudest source of instantaneous maximum noise events (L_{max}) was the discharge of fireworks near the Fourth of July holiday weekend. The loudest L_{max} captured for the entirety of the monitoring period was 121 dBA, which occurred on July 5 at 12:49 a.m. Sound data from this monitoring period was not included in the UTL calculations due to the absence of herons during this period. However, historically herons have remained in the area through the end of July. To characterize the upper conditions of the ambient environment that the herons may experience on an annual basis, the statistical descriptors of sound measurements from the Fourth of July weekend were calculated separately from the other monitoring periods and are presented in Table B-3.

Table B-3: Fourth of July Weekend Maximum and Upper Tolerance Limit of L_{eq} and L_{max}
March Point Heronry Management Plan, Anacortes, WA

Results reported in dBA

Noise Monitoring Site	L_{eq}		L_{max}		Number of Hourly Measurements
	UTL	Maximum Recorded	UTL	Maximum Recorded	
SE (Nesting Area)	60.8	62.8	86.6	98.6	172
SW (Nesting Area)	63.3	78.7	94.2	121.5	171
NE (Foraging Area)	58.6	71.7	89.3	101.9	171

Note(s)
1. UTL and Maximum L_{max} and L_{eq} were calculated from data collected between 7/2/2021 and 7/9/2021.
2. All hours were included in the data set to include the loudest instances of instantaneous noises.

Abbreviation(s)
L_{eq} = average (equivalent) sound level measured over a one-hour period
L_{max} = maximum sound level measured on fast response for 1-second duration
NE = northeast
SE = southeast
SW = southwest
UTL = upper tolerance limit

B.6 Monitoring Period Six Noise Levels

Sound data from this monitoring period was not included in the UTL calculations due to the absence of herons during this period. The statistical descriptors of sound measurements from monitoring period six were calculated separately from the other monitoring periods and are presented in Table B-4.

Table B-4: Period Six Maximum and Upper Tolerance Limit of L_{eq} and L_{max}
March Point Heronry Management Plan, Anacortes, WA

Results reported in dBA

Noise Monitoring Site	L_{eq}		L_{max}		Number of Hourly Measurements
	UTL	Maximum Recorded	UTL	Maximum Recorded	
SE (Nesting Area)	60.6	61.2	81.7	83.0	93
SW (Nesting Area)	65.3	65.8	85.6	90.7	93
NE (Foraging Area)	50.1	50.4	74.3	76.7	93

Note(s)
1. UTL and Maximum L_{max} and L_{eq} were calculated from data collected between 7/23/2021 and 7/30/2021, between 6:00 a.m. and 7:00 p.m.

Abbreviation(s)
L_{eq} = average (equivalent) sound level measured over a one-hour period
L_{max} = maximum sound level measured on fast response for 1-second duration
NE = northeast
SE = southeast
SW = southwest
UTL = upper tolerance limit

B.7 References

Azerrad, J. M. 2012. Management recommendations for Washington's Priority Species: Great Blue Heron. Washington Department of Fish and Wildlife, Olympia, Washington. March.

U.S. Environmental Protection Agency (USEPA). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. 550/9-74-004. Office of Noise Abatement and Control.

USEPA. 2013. ProUCL Version 5.1 User Guide: Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations. Office of Research and Development.

Appendix C

Noise Monitoring Data Metrics

Appendix C – Noise Monitoring Data Metrics

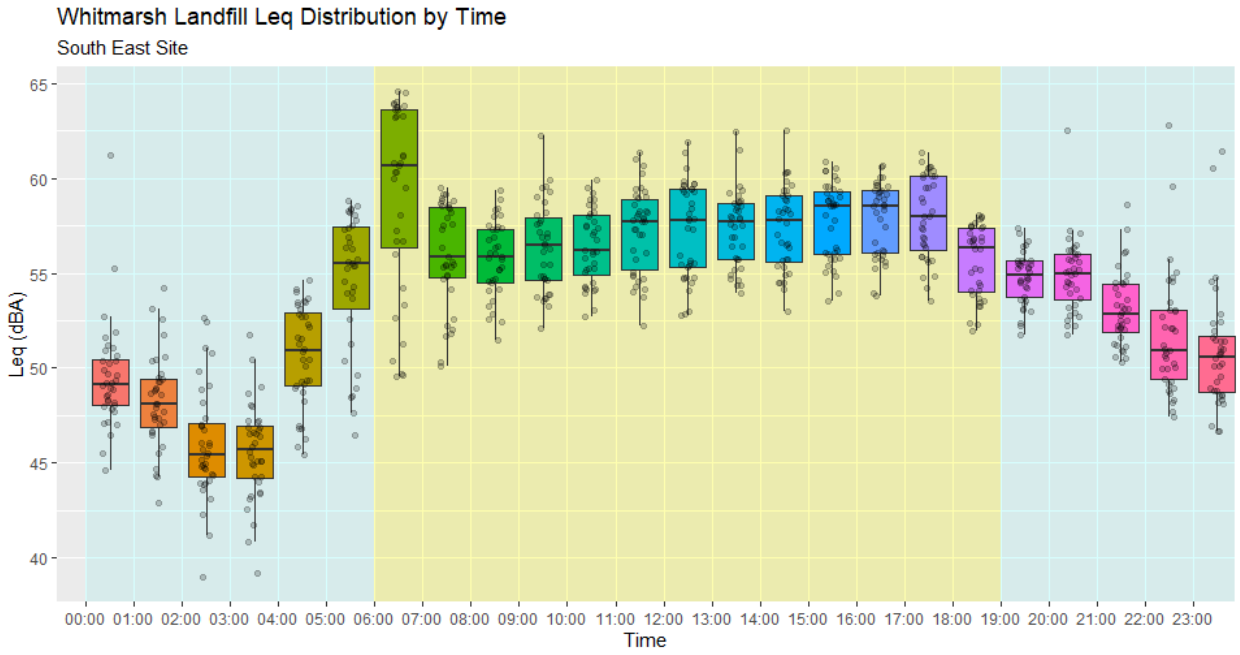
C.1 Hourly Noise Level Data Box and Whisker Plots

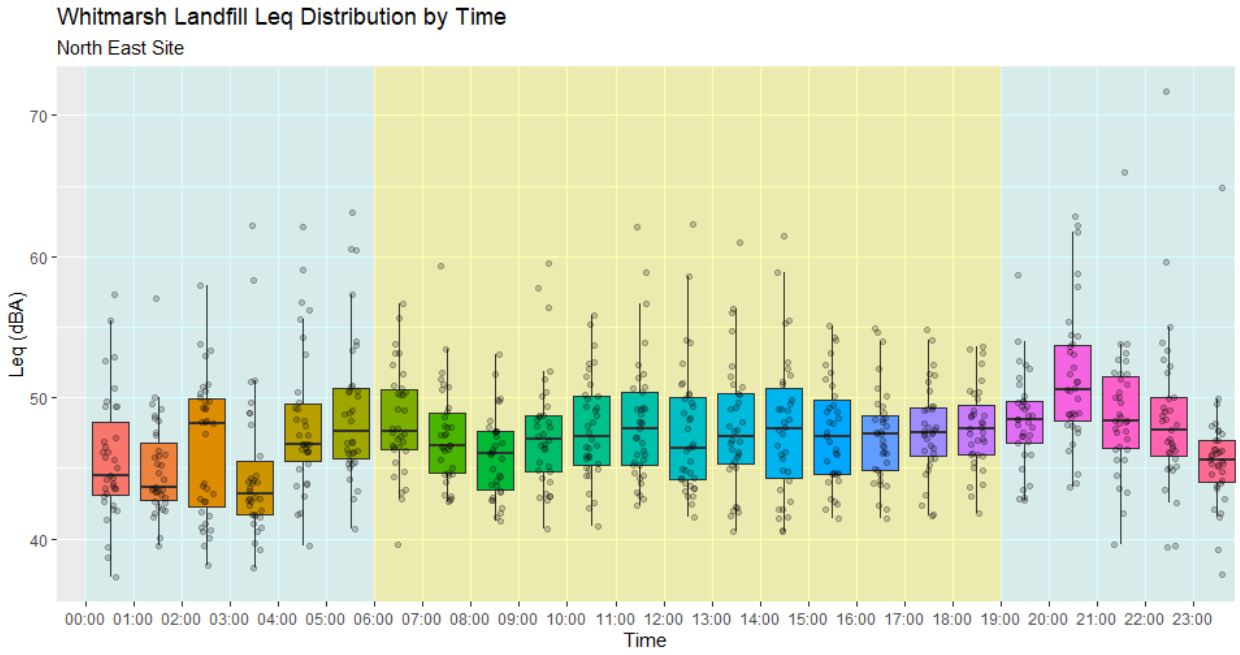
The box and whisker plots presented in this appendix show the L_{eq}, L_{25}, $L_{8.3}$, and $L_{2.5}$ metrics for each of the noise monitoring sites. These metrics are comparable to the Washington State Administrative Code (WAC) 173-60 maximum permissible sound levels and allowable exceedances (i.e., L_{25}, $L_{8.3}$, and $L_{2.5}$ are comparable to the maximum permissible sound levels and allowable exceedances for 15 minutes, 5 minutes, and 1.5 minute, respectively). Each individual transparent dot on the box plot figures represents an individual hourly observation for the metric (such as L_{eq}). The horizontal line in each box represents the median of the data set. The upper and lower boundaries of the box define the middle 50 percent of the data (between the 25th and 75th percentiles). The upper and lower "whisker" lines extending from the box represent the upper and lower extremes. The upper and lower extremes are the largest or smallest measured values no further than 1.5 times the inter-quartile range (the difference between the top and bottom of the box). Measurements outside these extremes are candidates for consideration as outliers.

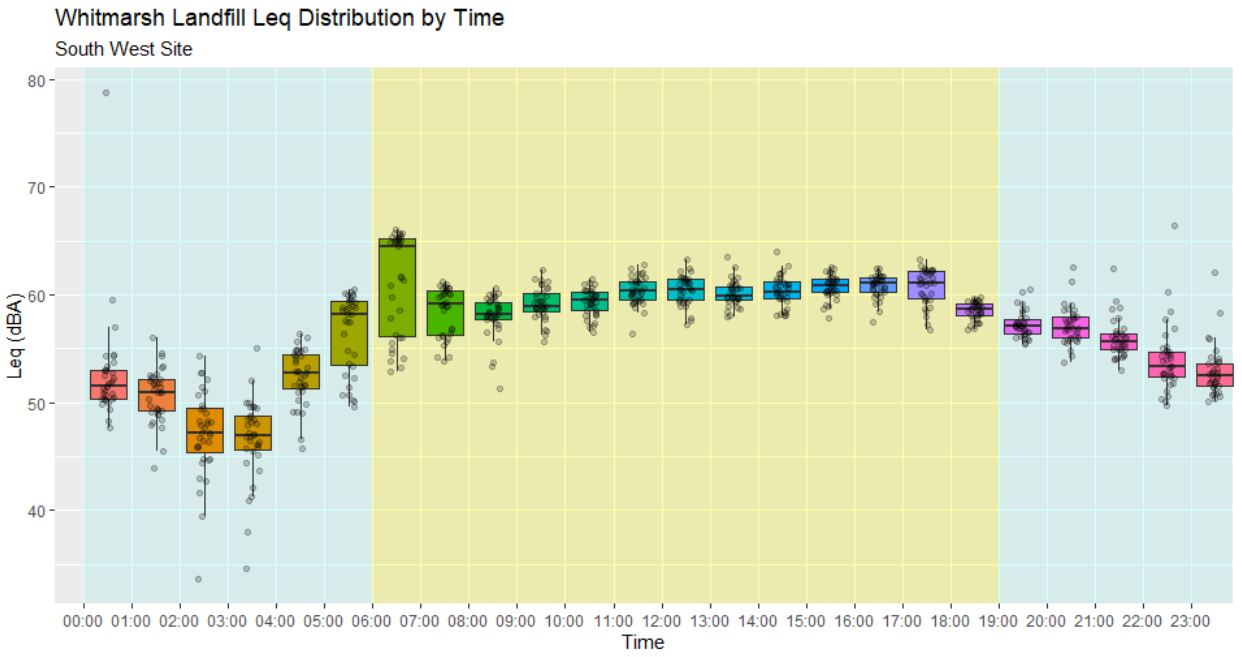
Daytime and nighttime hours are depicted by the change in background color at 6:00 a.m. and 7:00 p.m. No monitoring period or selected time periods were excluded in the plotting of the box plots. The representation of L_{eq}, L_{25}, $L_{8.3}$, and $L_{2.5}$ metrics was reviewed for qualitative understanding of the ambient environment. Qualitative findings are discussed further in Heron Management Plan.

C.1.1 Box Plots of Hourly Average Sound Level (L_{eq})

The box plots below present a graphical representation of the hourly average sound level (L_{eq}) at each noise monitoring location.

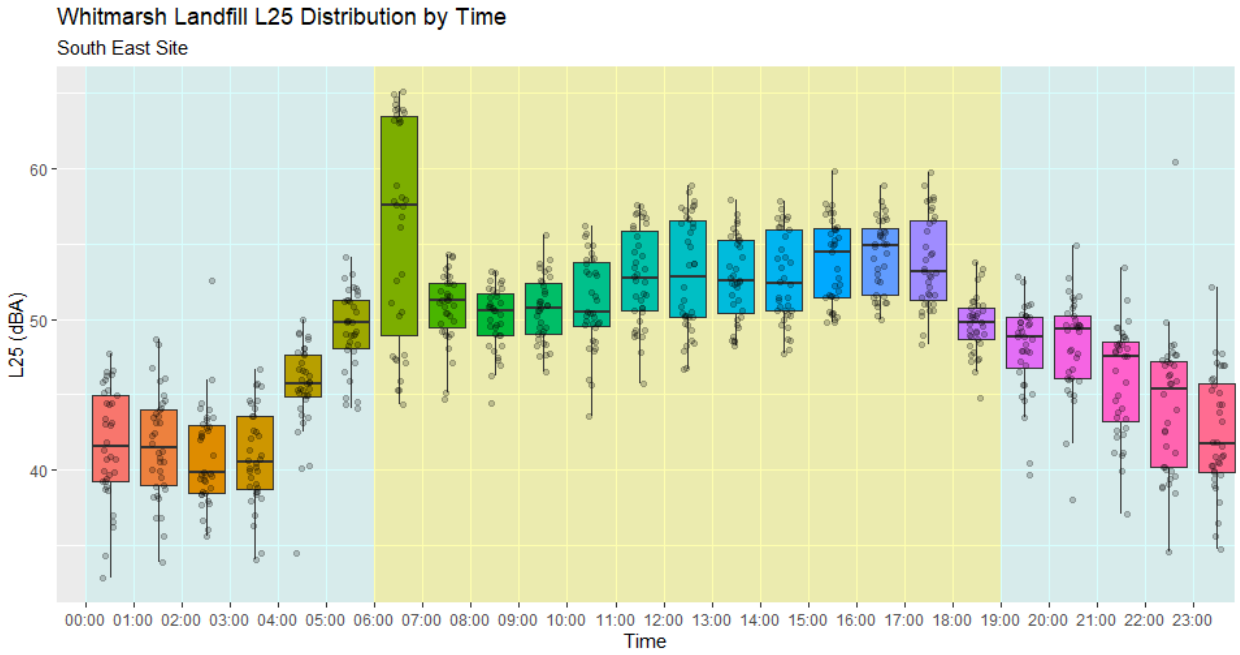


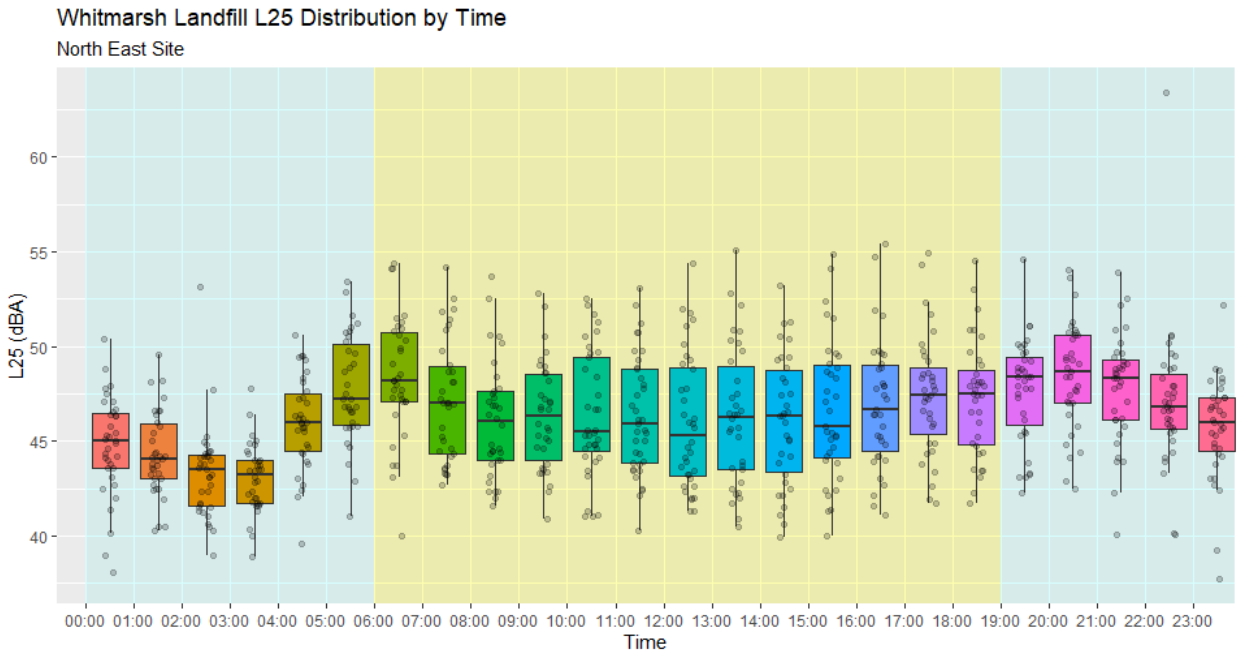


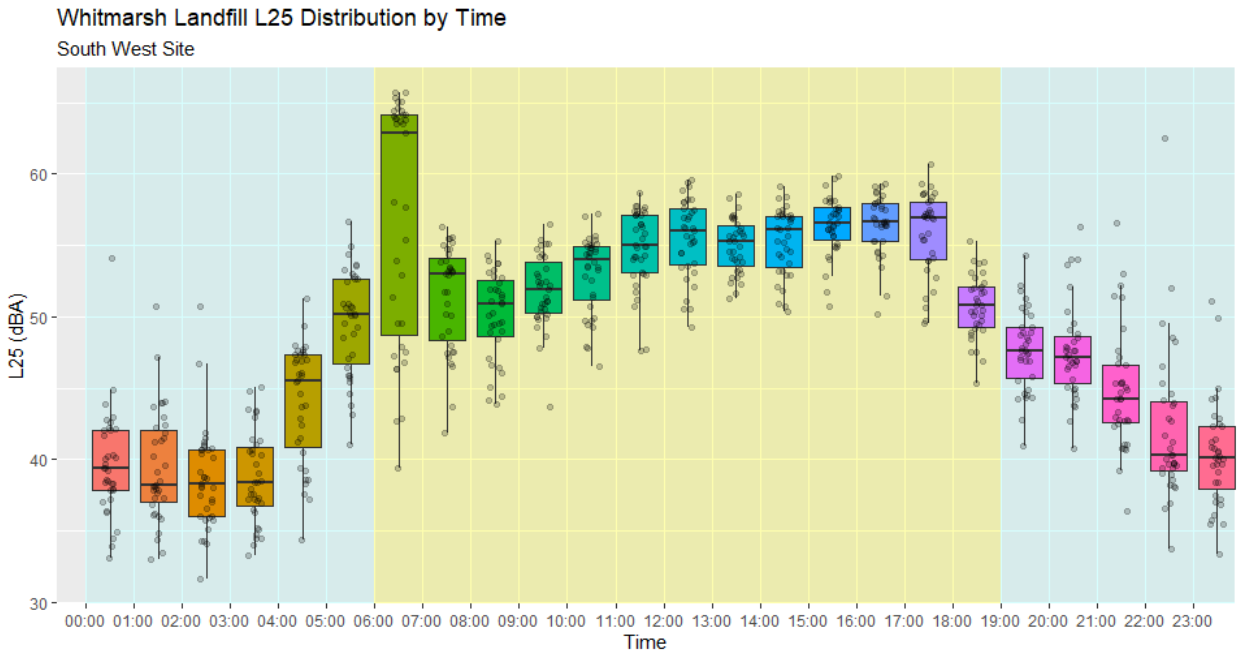

Whitmarsh Landfill Leq Distribution by Time
South West Site
Leq (dBA)
80
70
60
50
40
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
Time

C.1.2 Box Plots of Hourly L_{25}

The box plots below present a graphical representation of the statistical descriptor of the sound level exceeded 25 percent of the time in an hour (L_{25}) at each noise monitoring location.

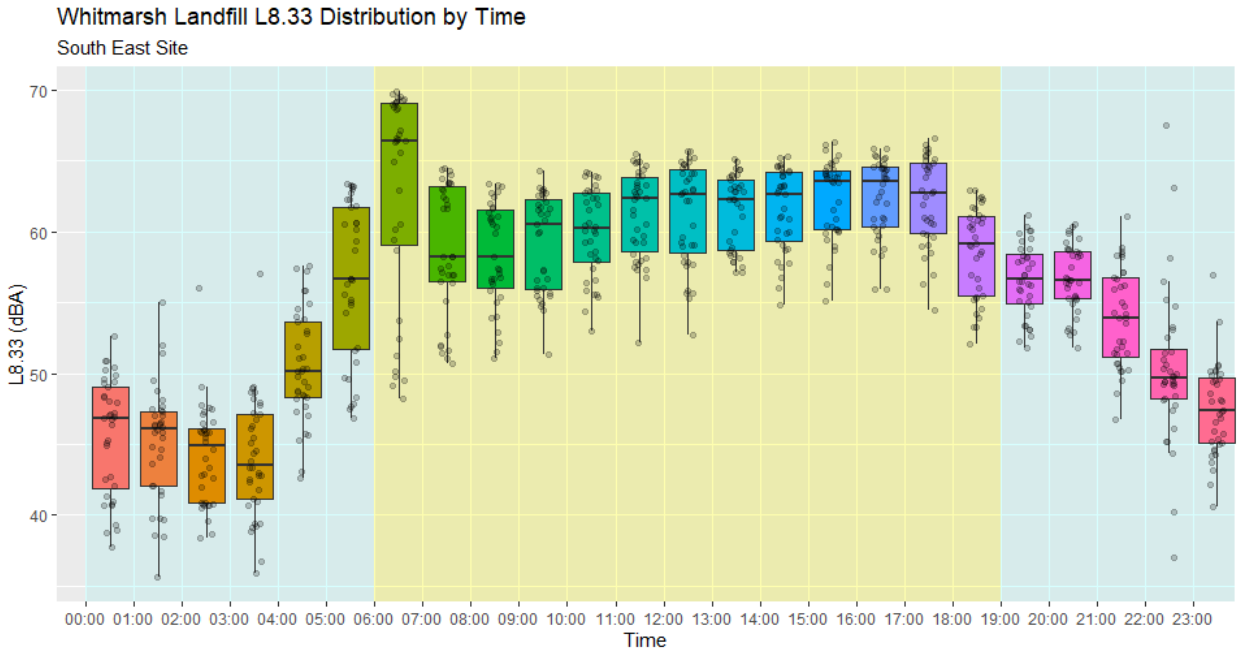


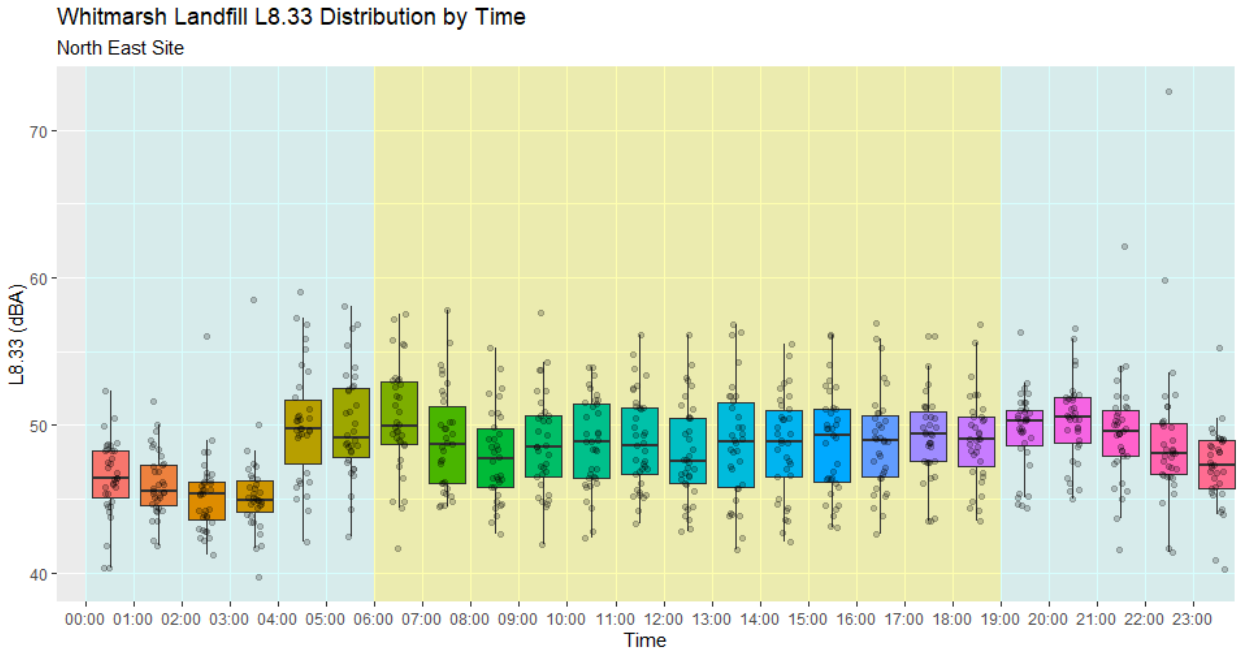


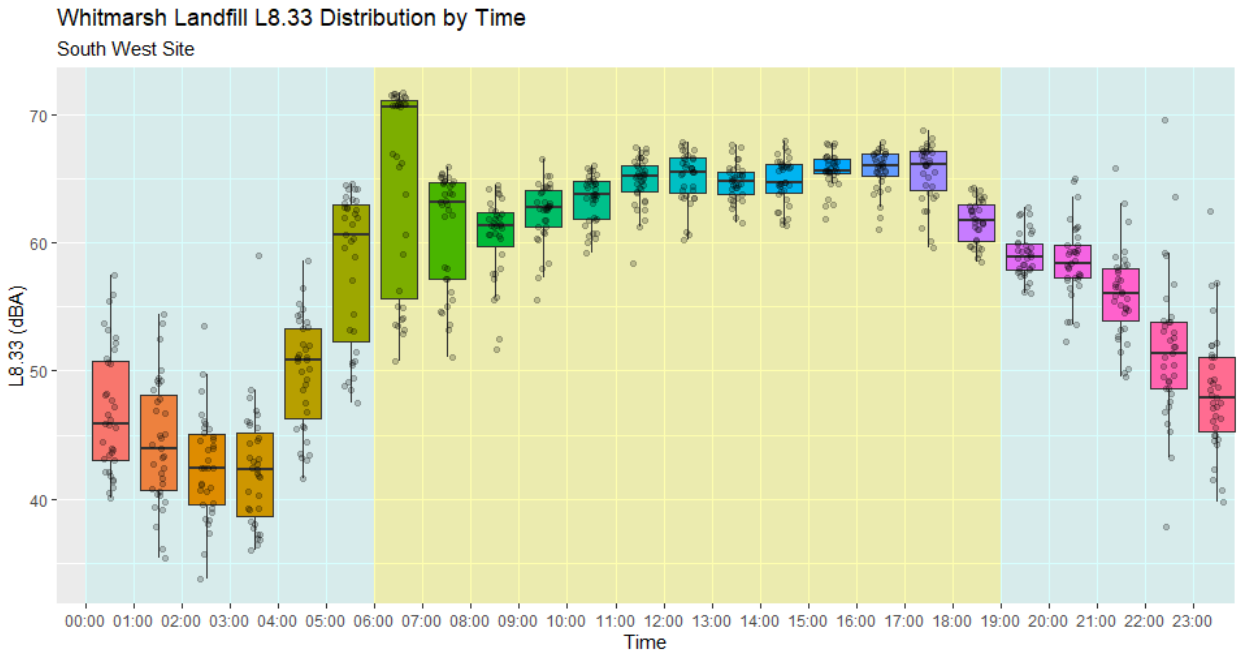

Whitmarsh Landfill L25 Distribution by Time
South West Site
L25 (dBA)
60
50
40
30
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
Time

C.1.3 Box Plots of Hourly $L_{8.33}$

The box plots below present a graphical representation of the statistical descriptor of the sound level exceeded 8.33 percent (equivalent to 5 minutes per hour) of the time in an hour ($L_{8.33}$) at each noise monitoring location.

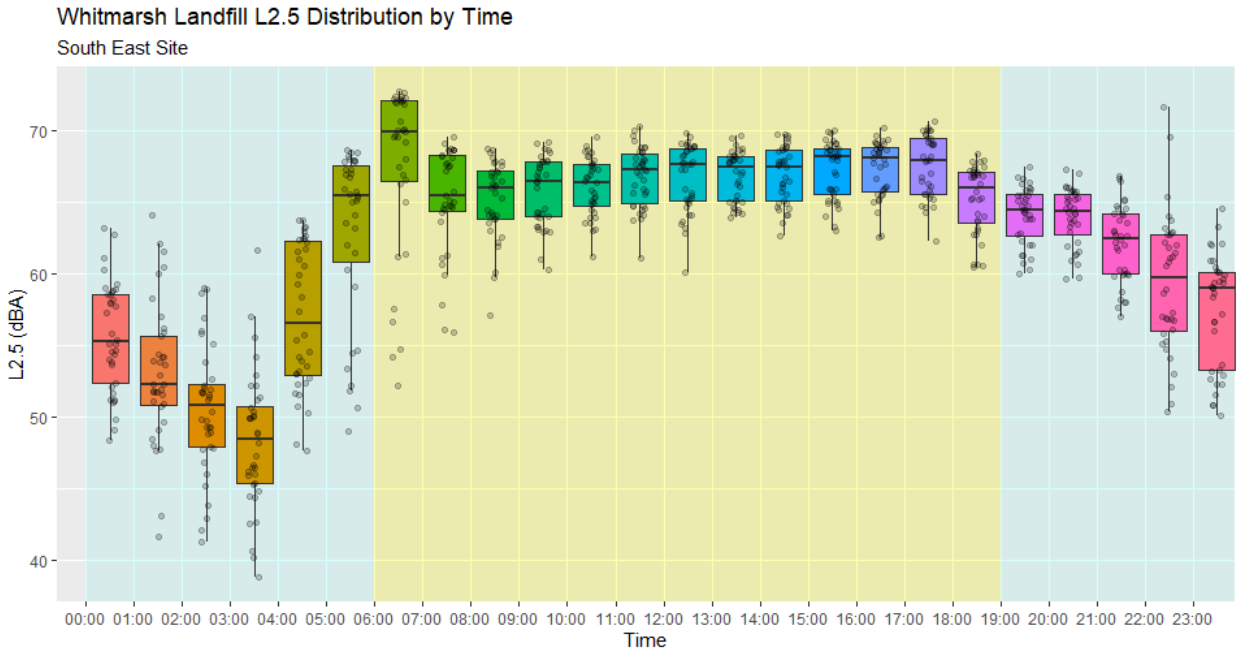


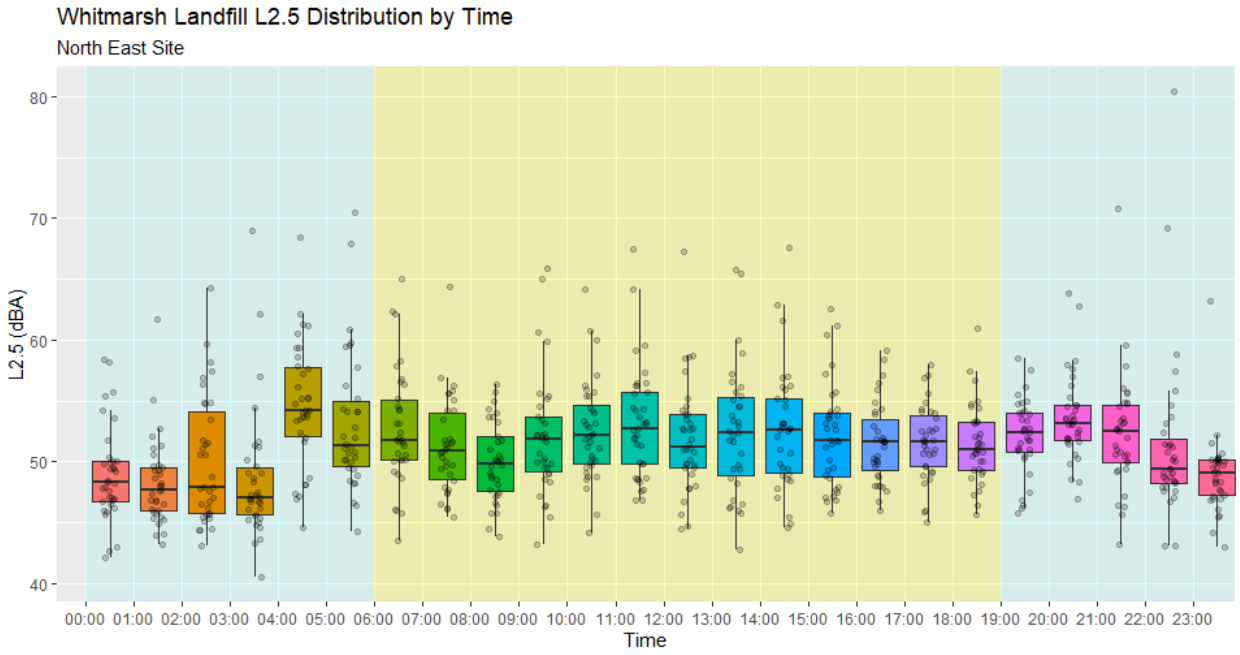


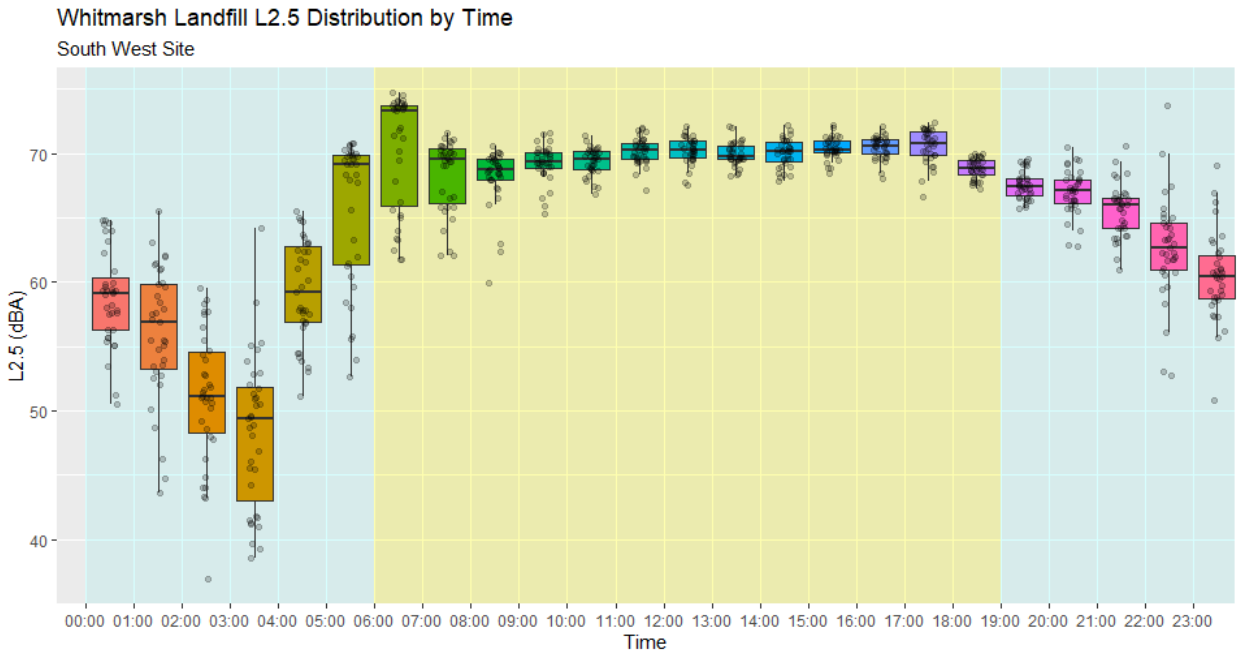

Whitmarsh Landfill L8.33 Distribution by Time
South West Site
L8.33 (dBA)
70
60
50
40
00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
Time

C.1.4 Box Plots of Hourly $L_{2.5}$

The box plots below present a graphical representation of the statistical descriptor of the sound level exceeded 2.5 percent (equivalent to 1.5 minutes per hour) of the time in an hour ($L_{2.5}$) at each noise monitoring location.







C.2 Hourly Noise Level Data Tables

The hourly L_{eq}, L_{max}, L_{25}, $L_{8.3}$, and $L_{2.5}$ values were tabulated from the collected data for each monitoring location, and are presented in Tables C-1 through C-3. These metrics are comparable to the WAC 173-60 maximum permissible sound levels and allowable exceedances (i.e., L_{25}, $L_{8.3}$, and $L_{2.5}$ are comparable to the maximum permissible sound levels and allowable exceedances for 15 minutes, 5 minutes, and 1.5 minute, respectively).

If the sound level exceeds the maximum permissible sound levels in WAC 173-60, they were highlighted in red. Although the WAC does not apply to many of the sources of sound that are contributing to the ambient noise level, the metrics can be used for comparison with future measurements when construction activities begin. Applicability of WAC 173-60 is discussed in Appendix B.

Wind speed data is also presented in the last column of the tables. WAC 173-58 states that ambient environmental noise should not be collected when wind speeds exceed 12 miles per hour. Though there were several instances where the wind speed did exceed the 12 miles per hour limit, the data for these times was still retained because it was representative of the ambient environment that herons are commonly exposed to at the heronry. Values above the 12 miles per hour limit are highlighted in the table.

TABLE C-1: Hourly Noise Level Data, SE Site

Whitmarsh Heronry, Anacortes, WA

Date	Time	Hourly Ambient Noise Levels (dBA)					
		L_{eq}	L_{25}	$L_{8.33}$	$L_{2.5}$	L_{max}	Wind Speed
4/9/2021	2:32 PM	60.2	56.7	65.3	69.7	77.0	6.9
4/9/2021	3:00 PM	60.5	57.7	66.1	70.0	77.8	5.8
4/9/2021	4:00 PM	60.6	58.9	65.8	69.4	79.2	7.2
4/9/2021	5:00 PM	59.6	55.8	64.8	69.1	79.4	8.9
4/9/2021	6:00 PM	57.4	52.6	61.2	66.9	76.4	9.5
4/9/2021	7:00 PM	55.1	52.5	57.4	64.3	75.4	11.5
4/9/2021	8:00 PM	56.2	52.7	59.5	65.7	74.7	12.0
4/9/2021	9:00 PM	54.5	49.1	56.8	64.8	75.0	11.8
4/9/2021	10:00 PM	55.7	45.7	56.5	65.3	82.3	14.7
4/9/2021	11:00 PM	52.8	40.5	46.8	62.1	76.4	13.9
4/10/2021	12:00 AM	55.2	43.0	52.6	63.1	82.0	14.7
4/10/2021	1:00 AM	54.2	48.7	55.0	64.1	76.9	14.7
4/10/2021	2:00 AM	52.4	52.5	56.0	59.0	71.9	19.0
4/10/2021	3:00 AM	47.2	45.6	49.0	52.2	71.2	22.2
4/10/2021	4:00 AM	45.8	43.6	48.7	54.2	69.9	19.4
4/10/2021	5:00 AM	51.3	44.4	47.9	59.0	77.1	11.8
4/10/2021	6:00 AM	54.2	44.4	53.8	64.9	76.8	7.8
4/10/2021	7:00 AM	54.7	49.2	57.6	64.5	74.8	5.5
4/10/2021	8:00 AM	54.6	44.4	57.1	65.6	74.8	16.1
4/10/2021	9:00 AM	56.5	48.3	61.3	66.8	75.8	20.7
4/10/2021	10:00 AM	56.2	48.0	60.4	66.3	76.4	20.5
4/10/2021	11:00 AM	57.7	51.6	62.9	67.8	77.6	15.5
4/10/2021	12:00 PM	58.1	51.3	63.0	67.8	82.9	15.3
4/10/2021	1:00 PM	58.5	52.4	63.6	68.7	78.5	12.6
4/10/2021	2:00 PM	57.6	51.2	63.2	67.8	75.9	10.3
4/10/2021	3:00 PM	59.0	53.3	64.3	69.1	79.3	11.7
4/10/2021	4:00 PM	59.2	55.8	64.8	69.1	78.2	11.1
4/10/2021	5:00 PM	57.7	50.5	62.8	67.9	77.4	9.2
4/10/2021	6:00 PM	57.4	47.3	61.7	68.3	77.0	6.9
4/10/2021	7:00 PM	55.5	39.7	56.9	66.3	78.0	8.1
4/10/2021	8:00 PM	56.5	41.7	56.8	65.3	83.7	11.5
4/10/2021	9:00 PM	57.3	41.1	58.4	66.5	82.3	6.4
4/10/2021	10:00 PM	51.2	38.8	49.2	61.8	73.3	9.7
4/10/2021	11:00 PM	51.0	41.9	45.4	59.9	75.6	7.5
4/11/2021	12:00 AM	48.5	43.1	50.4	54.3	73.4	5.8
4/11/2021	1:00 AM	52.6	41.7	47.6	62.1	75.8	5.3
4/11/2021	2:00 AM	47.4	39.8	41.9	51.9	75.0	6.9
4/11/2021	3:00 AM	51.7	40.0	57.1	61.6	77.6	2.3
4/11/2021	4:00 AM	48.3	40.1	42.6	52.8	75.1	2.2
4/11/2021	5:00 AM	48.9	44.5	47.7	54.5	74.6	1.7
4/11/2021	6:00 AM	53.3	45.9	51.2	61.4	81.7	2.0
4/11/2021	7:00 AM	52.6	47.1	50.7	61.1	75.9	2.0
4/11/2021	8:00 AM	55.8	46.2	58.2	66.4	76.9	1.7
4/11/2021	9:00 AM	56.5	47.7	61.3	66.4	80.8	1.7
4/11/2021	10:00 AM	56.1	45.6	59.9	66.4	83.1	3.2
4/11/2021	11:00 AM	57.3	45.7	61.2	67.3	79.2	8.6
4/11/2021	12:00 PM	57.3	50.1	63.0	67.3	76.6	4.3
4/11/2021	1:00 PM	57.5	50.5	63.0	67.7	78.0	2.0
4/11/2021	2:00 PM	58.2	52.7	62.9	67.9	78.1	2.0
4/11/2021	3:00 PM	58.0	52.2	63.4	68.3	76.9	2.0
4/11/2021	4:00 PM	59.4	54.4	64.5	68.8	79.8	1.7
4/11/2021	5:00 PM	56.9	48.3	61.9	67.0	75.9	1.7
4/11/2021	6:00 PM	57.1	44.7	59.1	66.2	84.9	5.5
4/11/2021	7:00 PM	55.4	40.4	56.9	65.9	77.6	10.0
4/11/2021	8:00 PM	54.4	38.0	52.7	63.6	82.3	11.5

4/11/2021	9:00 PM	53.2	37.1	46.8	62.3	77.3	13.0
4/11/2021	10:00 PM	48.8	34.6	37.0	50.9	75.6	13.3
4/11/2021	11:00 PM	51.6	35.6	44.5	60.9	78.4	13.9
4/12/2021	12:00 AM	49.2	34.3	38.8	58.0	74.1	13.0
4/12/2021	1:00 AM	53.1	39.9	51.4	60.4	82.7	12.8
4/12/2021	2:00 AM	42.3	36.7	38.7	41.3	72.6	11.7
4/12/2021	3:00 AM	45.3	39.0	40.7	42.6	73.5	9.7
4/12/2021	4:00 AM	52.1	42.5	45.3	61.0	77.1	10.3
4/12/2021	5:00 AM	56.4	47.9	60.7	67.0	77.1	7.8
4/12/2021	6:00 AM	64.0	63.9	69.9	72.6	78.9	5.5
4/12/2021	7:00 AM	58.7	51.5	63.4	68.7	78.4	3.1
4/12/2021	8:00 AM	56.7	47.5	61.1	66.8	77.4	1.4
4/12/2021	9:00 AM	57.1	49.0	61.7	67.8	75.3	3.5
4/12/2021	10:00 AM	58.9	54.9	64.2	68.9	76.9	0.3
4/12/2021	11:00 AM	58.0	51.5	63.1	68.0	76.4	3.4
4/12/2021	12:00 PM	59.3	55.2	64.6	69.0	79.0	0.6
4/12/2021	1:00 PM	62.5	55.5	64.9	69.5	90.0	2.6
4/12/2021	2:00 PM	60.3	55.5	65.2	69.7	81.6	2.5
4/12/2021	3:00 PM	60.4	57.4	65.7	69.9	79.1	3.7
4/12/2021	4:00 PM	59.6	55.5	65.2	69.1	77.7	4.9
4/12/2021	5:00 PM	60.4	54.4	64.5	69.7	87.5	10.0
4/12/2021	6:00 PM	56.5	48.7	60.3	66.7	75.6	9.2
4/12/2021	7:00 PM	54.5	48.8	55.1	64.0	78.3	15.3
4/12/2021	8:00 PM	53.4	47.5	51.8	61.4	77.3	19.6
4/12/2021	9:00 PM	52.5	42.3	49.5	62.7	75.4	20.2
4/12/2021	10:00 PM	47.7	38.4	40.2	50.4	75.0	17.8
4/12/2021	11:00 PM	50.7	34.8	42.1	59.5	76.1	15.3
4/13/2021	12:00 AM	47.8	36.6	38.9	53.6	75.5	13.6
4/13/2021	1:00 AM	49.5	39.5	45.8	56.2	76.0	12.8
4/13/2021	2:00 AM	47.0	38.4	40.5	45.2	75.7	9.7
4/13/2021	3:00 AM	42.6	39.5	41.2	42.6	72.8	6.1
4/13/2021	4:00 AM	53.5	40.2	43.0	62.2	77.6	6.9
4/13/2021	5:00 AM	56.6	52.7	60.6	66.7	75.0	6.4
4/13/2021	6:00 AM	63.8	64.3	69.5	72.2	78.6	6.4
4/13/2021	7:00 AM	58.6	51.9	63.5	68.6	81.1	8.1
4/13/2021	8:00 AM	58.4	52.0	63.2	68.4	79.2	10.3
4/13/2021	9:00 AM	59.9	51.7	62.7	68.7	86.2	9.5
4/13/2021	10:00 AM	55.3	50.4	60.3	65.4	74.4	7.2
4/13/2021	11:00 AM	59.4	57.0	65.0	68.8	76.3	4.3
4/13/2021	12:00 PM	59.4	56.6	65.2	68.9	76.0	4.4
4/13/2021	1:00 PM	59.2	54.8	64.5	68.5	84.7	4.6
4/13/2021	2:00 PM	59.4	54.1	63.9	68.8	81.4	3.1
4/13/2021	3:00 PM	59.9	57.5	65.4	69.4	79.5	4.0
4/13/2021	4:00 PM	59.7	56.5	65.4	69.2	77.8	6.7
4/13/2021	5:00 PM	59.0	53.9	64.2	69.0	76.6	9.2
4/13/2021	6:00 PM	56.7	47.4	60.6	66.9	80.0	10.0
4/13/2021	7:00 PM	54.2	43.5	56.2	64.7	75.6	12.6
4/13/2021	8:00 PM	54.5	44.6	56.6	64.2	79.9	16.7
4/13/2021	9:00 PM	52.0	42.7	50.2	62.6	74.0	17.5
4/13/2021	10:00 PM	51.0	39.6	45.1	60.5	74.6	18.1
4/13/2021	11:00 PM	54.5	37.8	45.1	59.0	87.7	17.2
4/14/2021	12:00 AM	49.9	36.2	49.4	57.7	72.8	16.7
4/14/2021	1:00 AM	49.3	44.6	46.3	48.5	78.2	15.3
4/14/2021	2:00 AM	48.9	39.8	42.9	52.0	76.7	17.8
4/14/2021	3:00 AM	39.2	38.8	41.0	44.4	64.0	17.8
4/14/2021	4:00 AM	53.1	45.4	53.0	62.3	76.4	14.1
4/14/2021	5:00 AM	58.2	51.9	63.3	67.9	77.9	11.8
4/14/2021	6:00 AM	63.6	63.3	69.3	72.1	78.9	9.2
4/14/2021	7:00 AM	59.2	54.2	64.3	68.6	81.0	6.1
4/14/2021	8:00 AM	57.5	50.5	62.7	67.7	77.0	6.7
4/14/2021	9:00 AM	59.6	49.0	62.6	69.2	82.9	5.8
4/14/2021	10:00 AM	57.0	50.2	62.1	67.2	76.6	4.3
4/14/2021	11:00 AM	59.0	56.7	64.3	68.5	77.7	3.2

4/14/2021	12:00 PM	59.2	56.8	64.9	68.7	79.4	0.3
4/14/2021	1:00 PM	58.8	55.7	64.4	68.2	77.3	1.7
4/14/2021	2:00 PM	58.8	54.7	64.3	68.5	79.7	1.7
4/14/2021	3:00 PM	59.3	57.0	64.8	68.8	75.7	0.3
4/14/2021	4:00 PM	60.7	57.8	65.8	70.1	79.2	4.6
4/14/2021	5:00 PM	60.1	54.8	65.4	70.0	80.3	6.1
4/14/2021	6:00 PM	57.5	49.2	62.2	67.8	79.9	9.2
4/14/2021	7:00 PM	54.6	44.9	57.9	65.5	75.6	16.9
4/14/2021	8:00 PM	55.8	46.1	58.3	65.0	80.4	16.4
4/14/2021	9:00 PM	51.3	39.9	48.6	59.8	78.6	16.7
4/14/2021	10:00 PM	53.0	41.2	50.3	63.7	75.5	17.5
4/14/2021	11:00 PM	51.4	41.0	45.0	60.1	77.0	16.7
4/15/2021	12:00 AM	50.3	39.9	50.9	58.2	73.0	16.1
4/15/2021	1:00 AM	44.3	36.8	38.6	43.1	73.0	12.4
4/15/2021	2:00 AM	43.6	38.5	40.9	43.8	70.1	11.5
4/15/2021	3:00 AM	44.0	40.6	42.5	45.2	71.2	6.1
4/15/2021	4:00 AM	54.6	47.8	57.4	63.7	79.2	4.9
4/15/2021	5:00 AM	58.1	51.2	63.2	68.0	80.2	2.5
4/15/2021	6:00 AM	63.6	63.6	69.4	72.3	78.2	0.3
4/15/2021	7:00 AM	59.2	53.5	64.5	69.1	78.7	1.7
4/15/2021	8:00 AM	58.0	52.4	62.4	67.8	79.7	2.5
4/15/2021	9:00 AM	56.9	49.2	60.8	67.3	76.5	1.1
4/15/2021	10:00 AM	57.1	43.6	60.0	67.3	82.7	1.4
4/15/2021	11:00 AM	59.3	57.1	64.8	68.8	76.6	1.7
4/15/2021	12:00 PM	59.3	57.4	64.7	68.6	78.6	2.5
4/15/2021	1:00 PM	59.3	56.0	65.1	69.0	76.4	1.5
4/15/2021	2:00 PM	59.6	56.6	64.6	69.2	80.3	0.6
4/15/2021	3:00 PM	58.8	54.9	64.1	68.6	77.3	1.4
5/3/2021	3:14 PM	60.9	59.8	66.3	69.8	77.1	6.6
5/3/2021	4:00 PM	58.6	55.5	63.7	68.0	75.8	8.9
5/3/2021	5:00 PM	60.6	57.8	65.6	70.0	81.3	8.6
5/3/2021	6:00 PM	56.9	48.4	61.0	67.1	77.2	8.9
5/3/2021	7:00 PM	54.3	45.6	56.5	64.3	77.0	9.7
5/3/2021	8:00 PM	53.7	44.9	56.0	63.7	74.1	9.7
5/3/2021	9:00 PM	52.5	41.1	53.9	62.0	75.2	7.8
5/3/2021	10:00 PM	50.2	40.0	45.2	58.9	77.5	9.2
5/3/2021	11:00 PM	49.5	36.5	40.6	59.1	75.1	8.9
5/4/2021	12:00 AM	49.3	32.8	37.7	58.9	72.6	8.9
5/4/2021	1:00 AM	47.0	33.9	35.6	54.4	72.4	8.9
5/4/2021	2:00 AM	45.7	35.6	38.4	55.1	71.9	7.5
5/4/2021	3:00 AM	41.7	34.5	36.7	44.8	67.9	6.7
5/4/2021	4:00 AM	53.5	34.5	49.8	63.2	79.2	5.3
5/4/2021	5:00 AM	58.3	51.2	62.3	68.2	82.7	3.4
5/4/2021	6:00 AM	63.9	64.9	69.2	71.9	78.1	4.0
5/4/2021	7:00 AM	58.4	52.9	63.4	68.2	78.0	2.8
5/4/2021	8:00 AM	57.3	49.5	61.7	67.5	79.0	4.3
5/4/2021	9:00 AM	57.8	53.4	62.4	67.6	77.1	4.7
5/4/2021	10:00 AM	57.4	51.5	62.7	67.6	76.4	3.7
5/4/2021	11:00 AM	58.3	54.5	63.5	67.9	76.8	1.7
5/4/2021	12:00 PM	59.9	57.2	64.9	69.2	78.8	2.0
5/4/2021	1:00 PM	57.9	52.7	62.3	67.8	78.5	4.1
5/4/2021	2:00 PM	59.1	56.1	64.2	68.6	77.7	5.3
5/4/2021	3:00 PM	58.6	55.0	63.9	68.3	76.0	2.5
5/4/2021	4:00 PM	59.2	55.4	64.4	68.8	78.6	3.1
5/4/2021	5:00 PM	60.9	58.9	66.1	70.2	77.7	3.1
5/4/2021	6:00 PM	56.7	48.2	60.6	67.1	77.5	3.4
5/4/2021	7:00 PM	55.3	45.0	58.8	65.4	77.3	5.3
5/4/2021	8:00 PM	55.7	46.0	57.5	65.5	79.2	4.9
5/4/2021	9:00 PM	52.8	41.0	54.3	62.9	75.3	6.9
5/4/2021	10:00 PM	48.9	38.9	46.1	57.3	73.1	7.8
5/4/2021	11:00 PM	54.2	41.6	53.6	64.5	78.1	8.6
5/5/2021	12:00 AM	50.7	39.9	42.1	58.7	74.6	9.2
5/5/2021	1:00 AM	50.5	39.0	45.8	55.9	77.6	8.6
5/5/2021	2:00 AM	49.8	39.3	44.0	58.9	77.0	6.7
5/5/2021	3:00 AM	50.5	38.5	44.4	57.0	79.1	4.9
5/5/2021	4:00 AM	54.0	44.7	52.8	63.7	79.2	2.2
5/5/2021	5:00 AM	58.6	52.1	63.2	68.4	77.4	2.8
5/5/2021	6:00 AM	64.5	65.1	69.7	72.7	81.2	1.4
5/5/2021	7:00 AM	59.5	52.8	64.4	69.5	78.0	0.6
5/5/2021	8:00 AM	58.9	53.2	63.3	68.6	79.3	1.1
5/5/2021	9:00 AM	58.0	51.2	62.1	67.8	78.5	0.6

5/5/2021	10:00 AM	58.9	53.9	63.9	68.5	79.6	1.1
5/5/2021	11:00 AM	61.0	56.0	64.9	70.0	85.2	2.0
5/5/2021	12:00 PM	59.6	57.2	65.2	69.1	75.5	1.4
5/5/2021	1:00 PM	58.3	54.1	63.3	68.2	76.4	2.6
5/5/2021	2:00 PM	57.9	53.4	62.7	67.5	78.6	2.0
5/5/2021	3:00 PM	60.4	56.5	64.8	68.8	87.6	5.5
5/5/2021	4:00 PM	60.0	57.2	65.3	69.3	77.7	5.5
5/5/2021	5:00 PM	60.2	57.9	65.3	69.4	79.1	8.9
5/5/2021	6:00 PM	57.9	51.4	62.9	67.8	77.5	10.0
5/5/2021	7:00 PM	55.3	45.6	57.8	65.0	78.4	9.2
5/5/2021	8:00 PM	54.1	45.3	56.4	64.5	74.5	8.3
5/5/2021	9:00 PM	52.2	43.5	50.1	61.6	77.2	10.3
5/5/2021	10:00 PM	50.0	43.1	48.4	58.6	74.7	15.0
5/5/2021	11:00 PM	61.5	41.8	45.2	56.6	100.8	12.1
5/6/2021	12:00 AM	51.2	41.8	45.1	55.4	90.8	13.0
5/6/2021	1:00 AM	45.5	40.5	43.6	47.7	72.1	11.5
5/6/2021	2:00 AM	46.7	41.0	45.5	51.6	70.8	9.2
5/6/2021	3:00 AM	46.4	40.2	42.8	45.9	75.2	8.1
5/6/2021	4:00 AM	52.7	45.8	54.6	61.5	78.8	6.7
5/6/2021	5:00 AM	55.7	48.3	59.3	65.9	77.1	8.6
5/6/2021	6:00 AM	64.6	64.6	69.3	72.3	88.9	9.2
5/6/2021	7:00 AM	58.8	54.1	63.7	68.3	81.4	6.9
5/6/2021	8:00 AM	57.5	52.0	61.4	67.2	79.0	4.0
5/6/2021	9:00 AM	56.9	50.6	59.9	66.4	80.2	2.9
5/6/2021	10:00 AM	56.8	50.5	60.6	66.7	78.0	1.7
5/6/2021	11:00 AM	58.1	53.8	62.5	67.6	77.8	2.2
5/6/2021	12:00 PM	59.7	57.8	64.8	68.7	76.5	2.8
5/6/2021	1:00 PM	58.7	55.2	63.2	67.9	82.4	4.9
5/6/2021	2:00 PM	58.9	56.1	63.9	68.2	75.8	5.5
5/6/2021	3:00 PM	59.4	56.0	64.4	69.0	77.1	6.3
5/6/2021	4:00 PM	60.1	57.5	65.1	69.6	80.3	12.1
5/6/2021	5:00 PM	61.4	59.7	66.6	70.6	78.9	16.4
5/6/2021	6:00 PM	56.3	47.8	58.4	66.7	78.5	17.8
5/6/2021	7:00 PM	56.7	47.9	60.3	66.6	79.6	22.5
5/6/2021	8:00 PM	56.0	54.9	58.2	64.7	78.0	24.4
5/6/2021	9:00 PM	53.1	51.3	54.2	60.3	75.6	23.0
5/6/2021	10:00 PM	52.7	49.8	52.5	60.8	75.8	21.6
5/6/2021	11:00 PM	60.5	47.7	49.9	56.0	100.7	17.3
5/7/2021	12:00 AM	50.4	47.7	49.9	55.1	75.4	16.9
5/7/2021	1:00 AM	49.7	48.3	52.0	53.9	72.2	17.3
5/7/2021	2:00 AM	45.9	44.1	47.8	49.3	73.1	11.5
5/7/2021	3:00 AM	45.8	40.4	42.8	44.5	74.3	6.4
5/7/2021	4:00 AM	52.7	49.1	53.8	61.7	74.9	3.1
5/7/2021	5:00 AM	55.5	49.2	58.7	65.4	76.5	3.7
5/7/2021	6:00 AM	59.5	53.0	64.9	69.5	77.8	5.0
5/7/2021	7:00 AM	57.3	49.7	61.6	67.7	77.9	4.4
5/7/2021	8:00 AM	57.4	51.8	60.7	67.1	78.7	6.4
5/7/2021	9:00 AM	59.3	55.6	64.3	69.1	76.6	5.8
5/7/2021	10:00 AM	58.2	53.0	62.8	67.9	77.8	4.4
5/7/2021	11:00 AM	59.1	55.5	64.2	68.8	76.3	4.0
5/28/2021	12:00 PM	57.8	53.7	62.7	67.7	75.5	9.5
5/28/2021	1:00 PM	58.5	55.5	63.1	68.0	76.8	6.9
5/28/2021	2:00 PM	59.1	56.4	64.5	68.7	75.4	9.5
5/28/2021	3:00 PM	59.6	56.1	64.1	68.7	82.4	10.6
5/28/2021	4:00 PM	58.6	54.8	63.8	68.4	75.5	10.9
5/28/2021	5:00 PM	58.0	52.9	62.5	67.8	77.5	6.7
5/28/2021	6:00 PM	57.9	53.8	62.5	67.4	78.2	5.2
5/28/2021	7:00 PM	56.5	51.0	60.1	66.3	75.7	6.1
5/28/2021	8:00 PM	57.3	51.3	59.2	66.0	83.6	8.9
5/28/2021	9:00 PM	54.9	48.4	58.2	65.1	75.7	8.6
5/28/2021	10:00 PM	53.1	44.0	53.3	62.9	74.9	9.7
5/28/2021	11:00 PM	50.1	40.3	43.2	58.6	73.4	10.3
5/29/2021	12:00 AM	48.8	40.7	44.9	57.3	73.2	10.8
5/29/2021	1:00 AM	46.6	38.7	42.1	51.1	73.0	9.7
5/29/2021	2:00 AM	49.1	38.5	40.7	49.3	77.9	6.4
5/29/2021	3:00 AM	49.0	42.5	47.8	54.2	77.9	3.7
5/29/2021	4:00 AM	53.3	50.0	57.6	62.4	72.7	1.1
5/29/2021	5:00 AM	53.9	49.8	54.8	61.4	77.2	2.2
5/29/2021	6:00 AM	56.7	51.1	59.4	66.5	77.4	2.2
5/29/2021	7:00 AM	54.9	49.9	58.2	64.5	75.6	3.4
5/29/2021	8:00 AM	55.8	49.7	57.4	65.3	81.3	1.1
5/29/2021	9:00 AM	56.3	50.9	60.5	66.0	75.0	0.8
5/29/2021	10:00 AM	57.7	52.9	62.4	67.5	76.2	0.8

5/29/2021	11:00 AM	57.9	52.8	62.3	67.6	79.4	1.4
5/29/2021	12:00 PM	57.8	53.7	62.2	67.3	81.5	2.2
5/29/2021	1:00 PM	57.4	53.3	62.0	66.9	81.4	4.9
5/29/2021	2:00 PM	56.6	50.8	61.0	66.4	77.0	4.9
5/29/2021	3:00 PM	57.8	51.5	61.5	66.9	82.6	4.0
5/29/2021	4:00 PM	58.2	53.3	62.5	67.6	84.7	6.4
5/29/2021	5:00 PM	58.7	54.3	63.8	67.9	84.5	8.1
5/29/2021	6:00 PM	56.3	49.7	58.6	65.7	82.7	8.6
5/29/2021	7:00 PM	55.5	50.2	59.5	65.4	74.8	9.7
5/29/2021	8:00 PM	54.9	50.9	58.8	64.5	74.8	12.8
5/29/2021	9:00 PM	53.6	47.5	56.7	63.0	75.0	12.4
5/29/2021	10:00 PM	59.6	46.3	63.1	69.5	82.5	11.4
5/29/2021	11:00 PM	52.4	39.9	49.5	62.0	77.6	11.5
5/30/2021	12:00 AM	51.9	40.7	46.8	61.1	76.7	12.1
5/30/2021	1:00 AM	50.4	41.1	44.6	58.3	74.2	9.7
5/30/2021	2:00 AM	48.2	39.7	47.6	55.8	75.0	8.1
5/30/2021	3:00 AM	45.1	38.5	41.8	49.9	74.9	5.3
5/30/2021	4:00 AM	51.6	47.6	55.8	60.5	71.5	3.4
6/1/2021	12:00 PM	58.4	56.1	63.7	67.7	80.3	2.0
6/1/2021	1:00 PM	58.0	52.9	62.8	67.9	78.2	1.4
6/1/2021	2:00 PM	57.0	51.4	61.6	66.7	79.1	2.0
6/1/2021	3:00 PM	58.8	57.1	64.0	67.9	77.3	7.2
6/1/2021	4:00 PM	59.6	57.0	64.6	68.6	84.9	7.2
6/1/2021	5:00 PM	60.1	56.8	64.7	69.2	81.1	7.8
6/1/2021	6:00 PM	56.8	47.6	60.2	66.8	80.7	9.2
6/1/2021	7:00 PM	54.5	47.9	56.5	63.8	79.0	8.6
6/1/2021	8:00 PM	55.6	47.7	58.5	65.7	77.7	10.6
6/1/2021	9:00 PM	52.3	44.6	53.5	61.8	76.1	11.4
6/1/2021	10:00 PM	52.0	42.5	53.1	61.4	75.8	10.6
6/1/2021	11:00 PM	48.9	40.4	44.6	57.2	74.3	11.1
6/2/2021	12:00 AM	46.4	40.9	42.5	49.1	72.4	10.6
6/2/2021	1:00 AM	42.9	38.3	39.8	41.6	69.4	9.2
6/2/2021	2:00 AM	52.7	39.6	42.8	58.6	78.5	6.4
6/2/2021	3:00 AM	44.3	42.6	46.7	50.0	70.1	5.8
6/2/2021	4:00 AM	51.6	46.6	51.1	58.4	76.1	4.6
6/2/2021	5:00 AM	58.8	53.0	63.4	68.6	83.5	2.9
6/2/2021	6:00 AM	64.0	64.0	69.0	72.1	88.0	2.2
6/2/2021	7:00 AM	57.5	52.3	61.6	67.4	79.3	2.0
6/2/2021	8:00 AM	56.3	51.1	60.5	66.2	78.1	1.4
6/2/2021	9:00 AM	58.2	53.9	63.0	67.8	79.6	0.6
6/2/2021	10:00 AM	58.0	54.9	62.9	67.3	75.7	3.7
6/2/2021	11:00 AM	57.8	54.2	62.8	67.1	80.2	4.4
6/2/2021	12:00 PM	59.4	56.4	64.1	68.8	83.5	4.4
6/2/2021	1:00 PM	59.1	56.4	64.0	68.2	82.2	3.1
6/2/2021	2:00 PM	58.4	56.8	63.3	67.6	77.0	3.4
6/2/2021	3:00 PM	59.0	55.9	64.0	68.4	78.6	5.5
6/2/2021	4:00 PM	58.3	55.0	63.4	67.7	77.6	6.1
6/2/2021	5:00 PM	59.5	56.5	64.4	69.1	80.2	6.7
6/2/2021	6:00 PM	57.7	51.2	62.4	67.4	83.0	8.9
6/2/2021	7:00 PM	55.7	50.9	59.9	65.2	76.5	9.2
6/2/2021	8:00 PM	62.5	51.4	60.3	67.3	92.2	9.2
6/2/2021	9:00 PM	53.9	44.1	56.2	64.2	75.5	8.1
6/2/2021	10:00 PM	48.6	40.0	44.4	56.7	73.2	9.2
6/2/2021	11:00 PM	50.7	39.0	47.1	59.0	77.1	10.3
6/3/2021	12:00 AM	49.6	39.2	42.7	58.5	73.4	8.3
6/3/2021	1:00 AM	48.1	38.9	41.4	51.9	77.8	7.2
6/3/2021	2:00 AM	51.0	38.4	43.3	56.9	76.8	6.9
6/3/2021	3:00 AM	46.8	38.9	43.0	48.9	76.8	6.1
6/3/2021	4:00 AM	53.5	45.7	54.0	62.6	77.0	6.1
6/3/2021	5:00 AM	58.3	54.1	63.0	67.9	79.2	7.8
6/3/2021	6:00 AM	63.7	63.7	69.2	72.3	81.6	7.8
6/3/2021	7:00 AM	57.9	52.4	61.9	67.5	79.9	7.5
6/3/2021	8:00 AM	56.9	50.8	61.0	66.7	81.5	6.7
6/3/2021	9:00 AM	57.6	52.2	61.9	67.1	86.1	5.8
6/3/2021	10:00 AM	57.5	54.0	61.9	66.9	77.3	5.8
6/3/2021	11:00 AM	59.0	56.4	63.9	68.4	77.7	7.5
6/3/2021	12:00 PM	59.7	57.6	64.1	68.3	80.9	7.2

6/3/2021	1:00 PM	58.0	55.2	62.8	67.1	79.3	6.9
6/3/2021	2:00 PM	62.6	55.9	64.2	69.6	91.9	6.4
6/3/2021	3:00 PM	58.6	54.5	63.6	68.2	77.6	7.2
6/3/2021	4:00 PM	58.9	55.8	64.1	68.4	79.6	6.1
6/3/2021	5:00 PM	59.5	56.4	64.7	69.0	79.2	6.9
6/3/2021	6:00 PM	58.1	53.3	62.9	67.3	78.8	7.2
6/3/2021	7:00 PM	56.4	47.2	59.3	66.0	78.6	8.1
6/3/2021	8:00 PM	55.2	47.9	55.4	64.2	78.6	9.7
6/3/2021	9:00 PM	53.4	48.3	55.0	62.2	78.2	7.8
6/3/2021	10:00 PM	52.1	45.9	50.0	61.1	77.2	6.1
6/3/2021	11:00 PM	50.5	44.3	48.0	58.4	75.6	6.9
6/4/2021	12:00 AM	49.1	39.7	40.8	54.5	76.5	8.6
6/4/2021	1:00 AM	47.1	40.0	41.7	50.9	72.0	9.5
6/4/2021	2:00 AM	50.8	38.8	46.0	56.0	77.2	6.7
6/4/2021	3:00 AM	46.7	41.0	43.8	49.9	72.4	6.7
6/4/2021	4:00 AM	51.2	44.1	50.1	59.3	77.2	7.5
6/4/2021	5:00 AM	56.9	51.6	60.5	66.9	76.8	8.3
6/4/2021	6:00 AM	60.0	56.8	65.6	69.2	78.3	8.7
6/4/2021	7:00 AM	58.9	54.3	63.4	68.6	79.6	5.8
6/4/2021	8:00 AM	59.4	53.1	63.4	68.7	81.1	7.2
6/4/2021	9:00 AM	59.0	53.3	62.9	68.2	85.5	10.0
6/4/2021	10:00 AM	59.5	55.7	63.8	68.4	81.3	8.6
6/4/2021	11:00 AM	59.5	57.1	63.9	68.4	80.0	10.3
6/4/2021	12:00 PM	59.4	56.4	64.5	68.9	79.0	7.5
6/18/2021	11:00 AM	57.7	53.0	62.4	67.2	77.4	5.3
6/18/2021	12:00 PM	57.9	53.6	62.6	67.6	76.5	4.7
6/18/2021	1:00 PM	57.6	53.5	62.3	67.2	76.2	5.3
6/18/2021	2:00 PM	58.4	54.0	63.2	67.8	79.3	5.8
6/18/2021	3:00 PM	58.7	55.2	63.7	68.3	77.9	7.5
6/18/2021	4:00 PM	59.3	55.8	64.5	68.7	78.3	7.2
6/18/2021	5:00 PM	58.3	53.3	62.9	68.2	78.6	6.1
6/18/2021	6:00 PM	58.0	50.2	62.1	67.9	79.9	5.8
6/18/2021	7:00 PM	57.4	48.3	60.1	67.4	78.9	8.1
6/18/2021	8:00 PM	55.1	45.9	56.4	65.2	77.0	7.8
6/18/2021	9:00 PM	56.2	44.9	58.3	66.6	78.2	6.9
6/18/2021	10:00 PM	53.1	41.6	51.4	62.7	77.8	9.2
6/18/2021	11:00 PM	50.9	38.8	44.3	59.6	75.3	9.5
6/19/2021	12:00 AM	49.2	39.2	47.1	57.9	72.5	9.2
6/19/2021	1:00 AM	51.8	35.6	46.2	61.5	75.6	10.0
6/19/2021	2:00 AM	44.3	36.0	40.7	46.8	71.5	7.5
6/19/2021	3:00 AM	48.1	36.3	39.4	46.2	78.1	4.0
6/19/2021	4:00 AM	49.1	44.9	47.3	53.0	76.1	3.8
6/19/2021	5:00 AM	52.6	45.9	51.6	62.0	75.5	5.2
6/19/2021	6:00 AM	56.7	47.6	60.5	66.9	76.4	4.3
6/19/2021	7:00 AM	54.2	44.7	55.1	63.6	75.9	5.0
6/19/2021	8:00 AM	56.1	47.9	60.3	66.1	76.7	4.4
6/19/2021	9:00 AM	56.2	47.6	60.0	66.6	75.5	4.0
6/19/2021	10:00 AM	58.5	53.9	62.9	68.2	79.7	4.4
6/19/2021	11:00 AM	57.9	53.4	62.6	67.4	79.3	5.3
6/19/2021	12:00 PM	57.4	50.5	62.2	67.6	78.3	5.3
6/19/2021	1:00 PM	57.8	52.5	62.8	67.9	76.9	5.8
6/19/2021	2:00 PM	56.5	50.6	61.1	66.3	78.0	5.8
6/19/2021	3:00 PM	58.6	55.4	63.8	68.0	79.1	8.3
6/19/2021	4:00 PM	58.5	53.5	62.8	68.4	80.1	9.2
6/19/2021	5:00 PM	58.0	52.1	62.7	68.2	78.2	6.7
6/19/2021	6:00 PM	57.4	48.9	61.0	67.2	78.6	7.5
6/19/2021	7:00 PM	54.6	47.8	58.0	64.4	76.6	4.4
6/19/2021	8:00 PM	54.9	46.1	58.3	65.2	80.0	4.6
6/19/2021	9:00 PM	54.2	43.8	57.1	64.2	77.0	7.5
6/19/2021	10:00 PM	52.1	42.6	49.3	62.2	74.0	8.9
6/19/2021	11:00 PM	48.6	40.3	43.7	56.6	73.2	9.2
6/20/2021	12:00 AM	52.7	41.3	49.3	62.7	75.9	7.8
6/20/2021	1:00 AM	50.6	40.8	47.4	60.0	75.1	6.7
6/20/2021	2:00 AM	45.5	39.4	40.7	46.0	70.7	6.4
6/20/2021	3:00 AM	47.2	39.9	42.3	50.4	73.7	5.0
6/20/2021	4:00 AM	49.1	44.9	48.4	55.7	73.4	3.4
6/20/2021	5:00 AM	48.5	44.1	47.5	51.8	74.5	1.1

6/20/2021	6:00 AM	52.6	45.3	52.4	61.2	76.1	2.0
6/20/2021	7:00 AM	52.3	45.1	52.0	61.3	75.9	0.3
6/20/2021	8:00 AM	54.2	47.3	56.7	64.3	74.7	1.1
6/20/2021	9:00 AM	54.6	47.5	55.7	64.2	80.3	2.0
6/20/2021	10:00 AM	55.2	48.1	59.2	65.3	75.7	2.0
6/20/2021	11:00 AM	57.3	50.7	61.5	66.9	84.3	1.4
6/20/2021	12:00 PM	55.3	48.4	59.1	65.2	75.5	0.0
6/20/2021	1:00 PM	56.9	51.3	61.7	66.3	80.5	1.1
6/20/2021	2:00 PM	58.3	52.5	62.6	67.4	85.7	3.4
6/20/2021	3:00 PM	57.4	51.5	62.1	67.1	76.7	5.0
6/20/2021	4:00 PM	57.9	55.0	62.1	67.4	76.4	6.9
6/20/2021	5:00 PM	55.6	48.9	59.8	65.5	75.2	10.6
6/20/2021	6:00 PM	55.2	48.8	59.1	65.2	76.0	12.4
6/20/2021	7:00 PM	55.6	46.5	58.1	65.8	80.8	11.4
6/20/2021	8:00 PM	55.7	45.0	58.8	65.7	77.4	11.7
6/20/2021	9:00 PM	54.5	42.6	56.1	64.1	77.5	12.4
6/20/2021	10:00 PM	55.0	40.2	48.1	62.8	84.2	13.6
6/20/2021	11:00 PM	52.3	40.9	50.5	62.1	74.0	13.3
6/21/2021	12:00 AM	49.7	37.0	39.3	53.8	77.6	13.6
6/21/2021	1:00 AM	48.1	36.8	38.5	51.8	76.5	13.9
6/21/2021	2:00 AM	45.4	37.9	42.6	52.6	74.2	12.4
6/21/2021	3:00 AM	45.1	38.1	39.2	40.6	76.1	9.7
6/21/2021	4:00 AM	52.3	48.1	54.9	59.9	75.6	9.5
6/21/2021	5:00 AM	57.4	49.9	62.3	67.3	76.6	6.9
6/21/2021	6:00 AM	63.2	63.2	68.6	71.8	80.3	2.2
6/21/2021	7:00 AM	57.6	51.3	62.3	67.2	80.0	1.7
6/21/2021	8:00 AM	56.0	49.4	59.9	66.0	76.6	0.8
6/21/2021	9:00 AM	57.2	52.8	61.5	66.9	79.5	0.6
6/21/2021	10:00 AM	57.5	53.2	61.5	66.7	83.3	0.3
6/21/2021	11:00 AM	58.6	53.3	63.3	68.1	77.9	1.1
6/21/2021	12:00 PM	58.7	54.8	63.6	68.2	79.8	1.1
6/21/2021	1:00 PM	58.8	56.5	63.9	68.2	76.1	1.4
6/21/2021	2:00 PM	58.1	53.8	63.2	67.8	76.7	2.0
6/21/2021	3:00 PM	58.6	55.0	63.5	68.2	79.0	8.9
6/21/2021	4:00 PM	58.8	55.0	63.7	68.1	80.6	10.0
6/21/2021	5:00 PM	60.3	57.2	65.0	69.7	80.8	12.1
6/21/2021	6:00 PM	56.8	49.8	59.6	65.3	91.7	12.1
6/21/2021	7:00 PM	55.3	47.9	58.3	64.7	79.6	12.8
6/21/2021	8:00 PM	56.4	49.3	60.1	66.1	79.2	13.6
6/21/2021	9:00 PM	53.2	42.2	53.9	63.5	74.6	12.7
6/21/2021	10:00 PM	50.9	40.2	49.2	61.2	73.1	11.7
6/21/2021	11:00 PM	50.1	39.8	47.3	59.4	73.3	11.7
6/22/2021	12:00 AM	48.9	38.7	41.0	55.8	73.7	11.1
6/22/2021	1:00 AM	49.4	42.3	47.3	57.0	74.0	10.6
6/22/2021	2:00 AM	41.1	39.2	40.9	42.9	69.5	10.1
6/22/2021	3:00 AM	47.9	37.9	39.4	46.0	75.9	5.3
6/22/2021	4:00 AM	54.1	48.8	57.2	63.3	76.2	3.2
6/22/2021	5:00 AM	58.4	49.0	62.7	68.4	81.0	3.1
6/22/2021	6:00 AM	63.3	63.0	68.7	72.0	81.4	3.1
6/22/2021	7:00 AM	58.4	51.1	62.5	68.5	82.8	2.5
6/22/2021	8:00 AM	58.4	50.6	62.0	67.8	84.1	2.2
6/22/2021	9:00 AM	62.3	52.6	62.6	67.9	97.6	3.1
6/22/2021	10:00 AM	58.6	54.4	63.3	68.2	77.5	2.0
6/22/2021	11:00 AM	60.2	56.8	65.0	69.6	78.8	2.8
6/22/2021	12:00 PM	59.7	55.8	64.1	68.5	85.1	2.2
6/22/2021	1:00 PM	58.3	52.6	62.3	67.7	82.6	0.0
6/22/2021	2:00 PM	59.4	56.8	64.6	68.8	79.2	0.3
6/22/2021	3:00 PM	59.2	55.7	63.8	68.6	81.5	3.2
6/22/2021	4:00 PM	59.0	56.6	64.3	68.3	77.1	8.9
6/22/2021	5:00 PM	60.6	57.9	65.8	70.0	79.7	7.5
6/22/2021	6:00 PM	55.2	46.5	59.0	65.2	76.9	5.8
6/22/2021	7:00 PM	55.4	46.9	58.8	65.7	75.0	5.8
6/22/2021	8:00 PM	56.0	48.0	59.9	65.8	77.7	7.8
6/22/2021	9:00 PM	55.4	45.8	58.9	65.2	78.2	6.9
6/22/2021	10:00 PM	54.7	47.3	58.1	64.0	76.7	6.1
6/22/2021	11:00 PM	50.2	40.9	44.2	59.4	72.9	6.9
6/23/2021	12:00 AM	51.1	38.6	40.7	58.8	76.5	7.2

6/23/2021	1:00 AM	49.3	38.1	39.7	55.6	75.6	6.1
6/23/2021	2:00 AM	46.0	37.8	40.8	49.7	75.1	6.7
6/23/2021	3:00 AM	44.9	34.0	35.9	38.8	74.2	9.2
6/23/2021	4:00 AM	53.7	45.8	55.8	62.9	76.4	8.3
6/23/2021	5:00 AM	57.8	49.9	61.7	67.8	81.4	6.4
6/23/2021	6:00 AM	63.3	63.1	68.8	72.0	81.1	4.3
6/23/2021	7:00 AM	58.8	53.3	64.0	68.7	81.3	2.8
6/23/2021	8:00 AM	58.1	51.4	62.8	68.1	78.9	3.1
6/23/2021	9:00 AM	57.6	50.9	61.6	67.4	77.3	5.3
6/23/2021	10:00 AM	58.1	53.1	62.4	67.7	82.2	7.2
6/23/2021	11:00 AM	58.2	56.2	63.3	67.6	76.2	6.1
6/23/2021	12:00 PM	60.5	58.4	65.7	69.8	78.6	4.3
6/23/2021	1:00 PM	58.8	55.0	64.0	68.4	76.2	3.7
6/23/2021	2:00 PM	59.9	57.8	64.7	68.9	81.7	2.5
6/23/2021	3:00 PM	59.6	55.9	64.6	69.1	79.7	3.4
6/23/2021	4:00 PM	59.4	56.5	64.5	68.8	78.6	5.3
6/23/2021	5:00 PM	60.6	58.1	65.9	70.0	78.8	3.4
6/23/2021	6:00 PM	57.5	50.3	61.7	67.0	84.2	4.0
6/23/2021	7:00 PM	57.1	49.8	61.2	66.7	78.9	6.4
6/23/2021	8:00 PM	56.9	46.7	58.7	66.0	82.4	5.8
6/23/2021	9:00 PM	56.1	46.6	58.6	64.5	85.2	4.4
6/23/2021	10:00 PM	53.5	39.4	55.2	63.2	80.2	8.9
6/23/2021	11:00 PM	51.0	39.4	50.2	60.9	75.2	8.9
6/24/2021	12:00 AM	50.4	38.9	40.7	59.0	74.8	6.9
6/24/2021	1:00 AM	47.7	38.2	39.8	54.2	73.0	5.5
6/24/2021	2:00 AM	46.9	37.7	39.6	53.8	73.4	6.7
6/24/2021	3:00 AM	44.3	38.4	39.1	40.2	73.8	4.4
6/24/2021	4:00 AM	52.9	45.3	53.6	62.4	75.5	3.1
6/24/2021	5:00 AM	57.5	49.8	61.8	67.8	77.3	2.5
6/24/2021	6:00 AM	63.8	63.9	69.1	72.2	84.2	2.5
6/24/2021	7:00 AM	58.2	50.2	63.0	68.1	80.7	3.4
6/24/2021	8:00 AM	57.3	50.3	61.6	67.1	79.5	4.4
6/24/2021	9:00 AM	58.7	53.7	63.1	68.4	79.7	4.6
6/24/2021	10:00 AM	59.9	55.5	64.1	69.5	79.8	3.1
6/24/2021	11:00 AM	61.3	57.6	65.5	70.3	81.3	2.0
6/24/2021	12:00 PM	61.9	58.9	65.7	69.5	92.5	3.1
6/24/2021	1:00 PM	59.6	57.0	64.4	68.6	84.1	3.5
6/24/2021	2:00 PM	60.3	57.3	64.8	69.4	81.2	3.4
6/24/2021	3:00 PM	60.1	57.1	65.0	69.3	81.8	2.5
6/24/2021	4:00 PM	59.8	56.8	64.8	69.1	83.4	3.7
6/24/2021	5:00 PM	60.2	57.4	65.1	69.4	81.2	3.1
6/24/2021	6:00 PM	56.7	47.2	60.8	66.8	77.3	4.6
6/24/2021	7:00 PM	55.7	44.6	58.2	65.1	80.5	6.7
6/24/2021	8:00 PM	57.1	46.5	60.5	67.0	81.3	9.5
6/24/2021	9:00 PM	54.4	43.4	57.1	64.5	76.9	11.1
6/24/2021	10:00 PM	52.1	39.1	51.5	62.0	76.0	11.5
6/24/2021	11:00 PM	51.4	39.7	50.1	60.1	75.9	8.6
6/25/2021	12:00 AM	48.2	39.4	41.3	54.6	72.8	6.7
6/25/2021	1:00 AM	48.9	40.5	42.1	51.7	74.9	6.4
6/25/2021	2:00 AM	39.0	39.7	40.8	42.1	55.3	4.9
6/25/2021	3:00 AM	46.5	37.0	38.8	46.5	74.6	2.2
6/25/2021	4:00 AM	51.0	45.4	51.9	57.4	74.7	1.1
6/25/2021	5:00 AM	57.3	48.2	60.2	67.3	80.8	0.8
6/25/2021	6:00 AM	58.1	50.2	62.9	68.0	78.1	0.6
6/25/2021	7:00 AM	58.5	50.4	62.9	67.6	81.1	1.1
6/25/2021	8:00 AM	56.4	49.6	60.9	66.3	76.2	1.1
6/25/2021	9:00 AM	59.5	53.2	62.8	68.6	84.0	0.8
6/25/2021	10:00 AM	59.2	56.2	63.9	68.6	79.2	2.2
6/25/2021	11:00 AM	60.7	57.5	64.7	69.3	83.9	0.6
7/2/2021	11:00 AM	56.2	50.7	60.5	66.2	75.2	2.8
7/2/2021	12:00 PM	55.4	50.2	59.1	65.2	74.5	4.4
7/2/2021	1:00 PM	56.4	51.0	61.1	66.1	77.5	1.1
7/2/2021	2:00 PM	56.6	51.4	60.9	66.3	77.0	2.0
7/2/2021	3:00 PM	56.3	51.4	60.9	65.9	74.6	0.0
7/2/2021	4:00 PM	56.1	51.5	61.0	65.8	73.3	0.6
7/2/2021	5:00 PM	56.8	51.6	60.5	66.4	80.7	4.0
7/2/2021	6:00 PM	55.0	50.6	58.1	65.3	72.5	7.8

7/2/2021	7:00 PM	55.7	50.1	55.5	63.8	82.3	7.2
7/2/2021	8:00 PM	55.0	49.5	55.3	64.2	79.9	7.5
7/2/2021	9:00 PM	52.9	48.7	54.7	62.6	76.7	6.7
7/2/2021	10:00 PM	54.6	46.9	49.1	56.8	87.9	8.3
7/2/2021	11:00 PM	52.0	46.0	50.0	60.4	75.7	8.1
7/3/2021	12:00 AM	51.6	45.3	50.9	58.5	75.4	4.9
7/3/2021	1:00 AM	48.6	43.5	46.4	54.2	71.9	7.2
7/3/2021	2:00 AM	43.8	42.2	45.2	47.7	68.7	3.7
7/3/2021	3:00 AM	43.1	40.7	43.3	45.4	69.8	3.7
7/3/2021	4:00 AM	46.8	44.9	47.0	50.3	72.4	1.7
7/3/2021	5:00 AM	50.4	47.9	49.6	54.6	74.4	0.6
7/3/2021	6:00 AM	51.3	47.3	50.1	57.5	73.8	2.8
7/3/2021	7:00 AM	52.0	48.1	51.9	60.6	76.0	1.7
7/3/2021	8:00 AM	52.8	46.9	54.0	62.5	78.6	3.4
7/3/2021	9:00 AM	53.3	46.5	54.9	63.3	76.3	2.2
7/3/2021	10:00 AM	54.0	47.9	56.6	64.3	73.2	0.0
7/3/2021	11:00 AM	54.7	49.1	57.9	64.7	77.5	1.1
7/3/2021	12:00 PM	54.8	48.6	57.9	65.0	74.6	1.1
7/3/2021	1:00 PM	54.4	48.5	57.9	64.6	73.7	1.1
7/3/2021	2:00 PM	55.4	48.7	59.1	65.1	78.5	2.8
7/3/2021	3:00 PM	55.7	50.4	60.2	65.9	73.2	2.5
7/3/2021	4:00 PM	56.0	51.1	60.9	66.0	71.8	4.9
7/3/2021	5:00 PM	56.6	50.6	59.6	65.2	85.9	9.2
7/3/2021	6:00 PM	54.1	49.3	56.9	64.2	72.6	12.1
7/3/2021	7:00 PM	54.7	48.8	55.8	64.4	80.3	11.5
7/3/2021	8:00 PM	54.3	50.4	56.7	63.8	78.8	12.1
7/3/2021	9:00 PM	54.6	49.9	55.9	63.7	79.1	10.0
7/3/2021	10:00 PM	54.5	48.2	54.7	62.7	86.1	9.2
7/3/2021	11:00 PM	51.5	46.9	50.6	60.1	74.7	8.9
7/4/2021	12:00 AM	50.9	45.1	48.3	59.3	75.5	9.2
7/4/2021	1:00 AM	47.6	43.1	45.5	52.9	72.1	8.3
7/4/2021	2:00 AM	44.0	43.0	46.5	49.8	69.5	6.4
7/4/2021	3:00 AM	43.4	40.1	43.3	46.5	70.7	3.5
7/4/2021	4:00 AM	46.2	43.1	45.6	48.1	71.4	2.0
7/4/2021	5:00 AM	46.5	44.8	46.8	49.0	71.8	3.1
7/4/2021	6:00 AM	49.6	45.3	48.2	56.6	73.4	3.4
7/4/2021	7:00 AM	51.8	49.0	52.7	59.9	72.5	3.4
7/4/2021	8:00 AM	52.6	48.2	52.2	61.9	75.6	3.4
7/4/2021	9:00 AM	53.6	51.0	55.2	62.9	71.4	3.7
7/4/2021	10:00 AM	54.5	50.1	55.6	63.9	81.2	3.4
7/4/2021	11:00 AM	54.3	49.3	58.0	64.2	76.6	2.3
7/4/2021	12:00 PM	56.0	50.2	60.4	65.9	74.7	2.5
7/4/2021	1:00 PM	54.9	48.6	58.9	65.0	75.2	2.6
7/4/2021	2:00 PM	55.7	49.6	60.0	65.5	81.4	5.5
7/4/2021	3:00 PM	55.4	50.3	60.2	65.0	75.2	6.1
7/4/2021	4:00 PM	55.2	50.0	58.8	65.1	77.2	5.8
7/4/2021	5:00 PM	55.7	51.0	59.1	65.5	77.1	6.9
7/4/2021	6:00 PM	54.1	50.9	56.7	63.7	72.1	6.4
7/4/2021	7:00 PM	54.8	50.3	56.3	63.8	89.5	5.5
7/4/2021	8:00 PM	56.2	51.9	58.6	65.3	83.4	7.5
7/4/2021	9:00 PM	58.6	53.4	61.1	66.8	90.4	8.1
7/4/2021	10:00 PM	62.8	60.4	67.5	71.6	86.6	7.5
7/4/2021	11:00 PM	54.8	52.1	56.9	63.3	82.6	7.8
7/5/2021	12:00 AM	61.2	46.6	50.2	60.3	98.6	6.9
7/5/2021	1:00 AM	48.8	44.1	46.6	53.6	72.8	11.0
7/5/2021	2:00 AM	44.7	42.6	46.6	51.7	72.6	9.2
7/5/2021	3:00 AM	46.9	44.6	48.2	52.9	71.1	6.3
7/5/2021	4:00 AM	45.4	45.1	47.7	50.7	69.6	5.8
7/5/2021	5:00 AM	47.6	47.1	49.7	52.2	70.0	4.3
7/5/2021	6:00 AM	49.6	47.5	49.8	54.7	72.0	6.7
7/5/2021	7:00 AM	51.6	48.9	51.4	57.8	75.4	3.7
7/5/2021	8:00 AM	53.3	48.9	51.5	60.1	78.5	3.1
7/5/2021	9:00 AM	52.1	48.4	51.3	60.3	72.8	3.1
7/5/2021	10:00 AM	54.3	51.3	55.4	63.5	74.1	4.4
7/5/2021	11:00 AM	55.0	50.6	57.5	64.7	74.8	5.8
7/5/2021	12:00 PM	54.1	50.1	55.7	62.8	76.6	5.3
7/5/2021	12:32 PM	52.8	49.6	52.7	60.1	86.2	5.3

7/5/2021	1:00 PM	55.2	52.3	57.1	64.3	76.2	3.4
7/5/2021	2:00 PM	54.5	50.6	56.8	64.1	75.7	4.4
7/5/2021	3:00 PM	55.1	50.4	58.7	64.8	76.6	2.2
7/5/2021	4:00 PM	55.4	51.1	58.6	65.0	74.4	3.4
7/5/2021	5:00 PM	54.8	51.6	56.9	64.6	79.1	5.3
7/5/2021	6:00 PM	53.7	51.2	54.2	62.7	72.7	6.1
7/5/2021	7:00 PM	53.0	50.2	53.4	62.0	72.3	5.5
7/5/2021	8:00 PM	55.3	51.5	55.2	62.9	84.9	7.2
7/5/2021	9:00 PM	52.1	49.4	52.3	58.7	72.8	8.6
7/5/2021	10:00 PM	49.4	47.1	49.4	55.8	70.8	6.9
7/5/2021	11:00 PM	46.7	43.8	45.9	52.3	68.1	8.9
7/6/2021	12:00 AM	48.3	44.3	46.9	52.4	74.3	7.2
7/6/2021	1:00 AM	48.6	43.6	46.0	51.5	75.8	9.2
7/6/2021	2:00 AM	43.9	42.9	45.8	52.2	62.8	9.5
7/6/2021	3:00 AM	46.5	43.6	46.3	48.8	71.4	4.6
7/6/2021	4:00 AM	49.3	47.1	49.4	52.4	72.5	3.4
7/6/2021	5:00 AM	55.6	50.5	56.6	65.5	76.1	2.5
7/6/2021	6:00 AM	60.3	56.1	66.4	70.0	74.9	3.5
7/6/2021	7:00 AM	56.4	52.8	58.2	65.7	78.5	2.5
7/6/2021	8:00 AM	55.3	52.6	55.4	63.5	81.4	1.7
7/6/2021	9:00 AM	55.4	50.7	55.8	64.3	78.5	0.8
7/6/2021	10:00 AM	55.1	49.9	58.1	64.8	75.5	0.8
7/6/2021	11:00 AM	57.0	52.6	59.2	65.6	86.0	2.9
7/6/2021	12:00 PM	55.7	52.1	59.2	65.4	75.3	2.5
7/6/2021	1:00 PM	55.7	52.4	58.5	65.1	77.2	2.2
7/6/2021	2:00 PM	55.7	50.2	60.1	65.7	77.5	2.0
7/6/2021	3:00 PM	55.8	50.5	60.3	65.8	74.1	3.7
7/6/2021	4:00 PM	56.0	51.4	60.9	66.1	74.8	2.9
7/6/2021	5:00 PM	56.3	51.0	60.8	65.8	75.7	2.2
7/6/2021	6:00 PM	53.3	49.1	53.9	62.0	74.8	3.4
7/6/2021	7:00 PM	52.2	49.2	53.1	61.0	72.2	4.0
7/6/2021	8:00 PM	52.8	49.5	54.4	61.5	72.7	7.8
7/6/2021	9:00 PM	52.1	48.1	51.9	60.3	77.1	8.1
7/6/2021	10:00 PM	50.7	47.6	49.8	55.3	84.1	7.2
7/6/2021	11:00 PM	48.1	45.6	48.1	52.3	71.7	8.1
7/7/2021	12:00 AM	48.0	46.0	48.0	52.1	69.2	7.2
7/7/2021	1:00 AM	47.9	45.9	48.1	51.7	73.7	6.7
7/7/2021	2:00 AM	44.9	43.5	46.0	48.8	70.6	4.9
7/7/2021	3:00 AM	45.0	44.6	47.2	50.1	69.4	3.1
7/7/2021	4:00 AM	50.1	47.7	50.1	53.9	73.3	2.8
7/7/2021	5:00 AM	55.4	52.0	56.7	65.1	73.0	4.6
7/7/2021	6:00 AM	60.8	57.5	66.6	70.1	79.8	4.4
7/7/2021	7:00 AM	55.9	52.4	58.2	65.4	74.7	4.4
7/7/2021	8:00 AM	55.7	52.6	57.3	63.8	81.3	5.0
7/7/2021	9:00 AM	55.4	52.5	57.2	64.3	77.6	2.5
7/7/2021	10:00 AM	56.2	53.7	59.3	65.6	72.2	2.9
7/7/2021	11:00 AM	57.0	54.9	60.2	65.7	74.9	6.4
7/7/2021	12:00 PM	61.3	57.5	62.8	68.9	84.7	4.4
7/7/2021	1:00 PM	61.5	57.9	63.8	69.6	83.0	5.0
7/7/2021	2:00 PM	56.4	52.3	59.9	66.0	74.9	5.5
7/7/2021	3:00 PM	56.1	52.7	60.1	65.5	74.1	4.6
7/7/2021	4:00 PM	57.4	54.0	62.0	66.6	74.3	4.9
7/7/2021	5:00 PM	57.4	53.2	61.0	66.7	78.5	10.1
7/7/2021	6:00 PM	53.9	50.7	55.5	63.6	72.0	13.0
7/7/2021	7:00 PM	53.1	49.8	52.6	61.3	76.5	13.0
7/7/2021	8:00 PM	52.7	50.0	54.9	61.3	70.7	13.3
7/7/2021	9:00 PM	52.0	49.4	52.3	59.9	72.0	13.0
7/7/2021	10:00 PM	49.9	46.9	49.4	56.1	73.7	12.4
7/7/2021	11:00 PM	48.3	44.3	46.6	50.8	73.7	10.0
7/8/2021	12:00 AM	47.0	44.4	47.0	51.2	70.2	10.0
7/8/2021	1:00 AM	46.6	43.7	47.0	50.7	69.7	10.0
7/8/2021	2:00 AM	43.9	42.8	45.8	48.9	69.2	8.9
7/8/2021	3:00 AM	48.7	45.6	48.7	55.5	74.1	4.6
7/8/2021	4:00 AM	48.7	46.0	48.3	51.6	73.8	3.7
7/8/2021	5:00 AM	55.4	50.8	55.6	65.7	73.4	4.0
7/8/2021	6:00 AM	61.1	57.9	66.9	70.6	83.6	3.1
7/8/2021	7:00 AM	55.3	50.8	57.1	65.1	75.0	3.4

7/8/2021	8:00 AM	54.5	49.0	55.0	63.8	76.9	3.4
7/8/2021	9:00 AM	54.7	49.8	56.6	64.0	75.2	2.8
7/8/2021	10:00 AM	55.2	49.7	58.0	65.1	76.8	3.4
7/8/2021	11:00 AM	58.2	51.7	59.7	66.5	90.0	2.8
7/8/2021	12:00 PM	55.4	50.4	58.3	64.9	76.9	2.0
7/8/2021	1:00 PM	56.4	50.1	57.9	65.4	83.1	2.2
7/8/2021	2:00 PM	55.3	50.6	59.4	64.9	74.4	1.1
7/8/2021	3:00 PM	56.2	51.6	60.0	65.9	79.2	1.1
7/8/2021	4:00 PM	56.2	52.5	60.4	65.5	77.2	1.7
7/8/2021	5:00 PM	57.3	52.8	61.0	66.3	79.4	4.0
7/8/2021	6:00 PM	54.4	50.9	56.0	64.0	75.8	5.2
7/8/2021	7:00 PM	53.0	49.7	53.4	61.3	73.9	7.2
7/8/2021	8:00 PM	54.0	50.2	56.6	63.4	73.2	5.8
7/8/2021	9:00 PM	51.6	47.8	51.4	60.0	77.4	2.8
7/8/2021	10:00 PM	48.3	45.0	47.4	54.7	70.5	7.5
7/8/2021	11:00 PM	46.9	43.2	45.7	50.8	69.3	8.3
7/9/2021	12:00 AM	48.3	43.1	46.4	54.0	71.5	5.8
7/9/2021	1:00 AM	44.3	41.2	44.1	48.0	68.3	7.8
7/9/2021	2:00 AM	44.7	42.0	45.8	51.5	73.0	8.3
7/9/2021	3:00 AM	47.2	42.1	45.5	52.2	74.4	5.2
7/9/2021	4:00 AM	48.9	46.5	48.8	52.3	74.9	2.5
7/9/2021	5:00 AM	54.0	49.0	55.2	63.2	74.4	3.4
7/9/2021	6:00 AM	57.3	52.6	60.2	67.4	76.5	4.3
7/9/2021	7:00 AM	55.3	51.3	56.4	64.6	76.8	4.4
7/9/2021	8:00 AM	54.1	50.7	55.8	63.0	75.0	6.4
7/9/2021	9:00 AM	54.7	49.4	56.0	64.0	77.5	2.5
7/9/2021	10:00 AM	56.0	51.8	60.1	65.8	75.2	2.6
7/9/2021	11:00 AM	56.1	51.3	59.4	65.9	79.4	2.8
7/9/2021	12:00 PM	55.5	50.1	59.0	65.6	74.2	4.9
7/9/2021	1:00 PM	56.9	52.1	60.0	66.4	76.7	3.1
7/23/2021	10:28 AM	55.8	50.4	58.4	64.9	77.1	N/A
7/23/2021	11:00 AM	54.9	49.3	57.3	64.4	77.3	N/A
7/23/2021	12:00 PM	55.5	49.7	59.6	65.3	74.2	N/A
7/23/2021	1:00 PM	54.7	49.4	58.7	64.5	74.6	N/A
7/23/2021	2:00 PM	54.5	50.0	57.8	64.1	75.5	N/A
7/23/2021	3:00 PM	56.0	52.3	59.4	64.5	80.4	4.4
7/23/2021	4:00 PM	56.6	52.6	60.3	65.9	77.4	5.2
7/23/2021	5:00 PM	55.8	52.5	59.0	65.3	75.7	4.0
7/23/2021	6:00 PM	52.3	49.5	53.3	60.6	83.0	3.4
7/23/2021	7:00 PM	51.7	48.7	52.3	60.0	73.5	5.1
7/23/2021	8:00 PM	51.8	49.2	53.0	59.7	73.8	7.8
7/23/2021	9:00 PM	50.9	47.5	50.4	59.9	70.1	9.5
7/23/2021	10:00 PM	50.5	48.3	51.0	57.0	74.4	9.2
7/23/2021	11:00 PM	49.3	46.9	49.4	53.2	75.5	6.9
7/24/2021	12:00 AM	48.6	46.3	49.6	55.1	72.7	6.7
7/24/2021	1:00 AM	48.8	44.4	47.0	53.8	77.1	7.5
7/24/2021	2:00 AM	46.9	43.3	45.7	47.9	75.1	4.0
7/24/2021	3:00 AM	46.1	42.3	45.1	47.3	76.0	2.8
7/24/2021	4:00 AM	46.8	43.5	45.7	47.6	75.6	0.8
7/24/2021	5:00 AM	48.5	46.5	48.3	50.6	73.6	0.8
7/24/2021	6:00 AM	49.7	47.1	49.1	54.2	73.7	2.0
7/24/2021	7:00 AM	50.3	49.2	51.1	55.9	73.3	2.0
7/24/2021	8:00 AM	52.4	48.2	51.1	59.7	81.1	3.1
7/24/2021	9:00 AM	53.7	48.2	56.0	63.1	76.3	2.5
7/24/2021	10:00 AM	52.7	46.0	54.4	63.0	73.4	2.2
7/24/2021	11:00 AM	53.7	47.8	56.8	63.7	72.8	2.5
7/24/2021	12:00 PM	53.0	46.7	55.7	63.4	75.9	3.1
7/24/2021	1:00 PM	54.0	48.2	57.1	63.9	72.0	3.4
7/24/2021	2:00 PM	53.0	48.6	54.8	62.6	74.6	4.0
7/24/2021	3:00 PM	54.0	50.0	56.3	63.3	74.1	4.0
7/24/2021	4:00 PM	53.8	50.8	55.9	62.6	74.3	1.7
7/24/2021	5:00 PM	54.2	50.2	56.3	64.3	72.6	3.4
7/24/2021	6:00 PM	52.4	50.2	53.3	60.5	71.9	6.4
7/24/2021	7:00 PM	53.5	50.8	54.7	62.3	72.0	7.2
7/24/2021	8:00 PM	52.9	49.6	55.3	61.9	72.1	10.8
7/24/2021	9:00 PM	51.1	48.2	50.1	58.2	74.9	9.7
7/24/2021	10:00 PM	50.0	47.5	49.8	56.9	71.1	10.0
7/24/2021	11:00 PM	48.8	46.9	49.2	52.9	71.8	6.7
7/25/2021	12:00 AM	47.1	45.8	47.9	51.2	67.1	9.7
7/25/2021	1:00 AM	47.4	44.9	47.5	51.7	69.9	8.3
7/25/2021	2:00 AM	45.2	44.0	47.3	51.4	70.3	4.3

7/25/2021	3:00 AM	40.9	41.3	44.5	46.6	61.9	3.1
7/25/2021	4:00 AM	46.9	45.3	48.2	51.5	69.4	2.8
7/25/2021	5:00 AM	49.6	48.5	50.8	53.4	75.7	3.4
7/25/2021	6:00 AM	50.4	47.4	49.5	52.2	81.0	4.9
7/25/2021	7:00 AM	50.1	48.8	51.6	56.1	72.4	4.7
7/25/2021	8:00 AM	51.4	50.8	52.9	57.1	70.6	6.4
7/25/2021	9:00 AM	53.5	51.9	54.5	61.0	73.6	5.8
7/25/2021	10:00 AM	53.1	49.6	53.0	61.2	79.0	6.1
7/25/2021	11:00 AM	52.3	48.8	52.2	61.1	72.5	5.8
7/25/2021	12:00 PM	54.8	50.8	55.3	63.6	79.0	5.3
7/25/2021	1:00 PM	55.1	51.6	57.5	64.2	77.5	5.0
7/25/2021	2:00 PM	54.5	50.9	56.0	63.5	77.8	6.1
7/25/2021	3:00 PM	53.5	50.1	55.1	63.0	74.2	7.2
7/25/2021	4:00 PM	54.0	51.1	55.9	62.5	79.3	6.1
7/25/2021	5:00 PM	53.5	50.6	54.5	62.3	74.0	9.5
7/25/2021	6:00 PM	53.5	53.0	55.4	60.4	71.6	8.9
7/25/2021	7:00 PM	53.6	52.8	55.1	60.7	71.4	8.1
7/25/2021	8:00 PM	52.5	49.4	53.8	60.9	72.1	6.7
7/25/2021	9:00 PM	50.3	48.8	51.3	57.6	68.4	7.2
7/25/2021	10:00 PM	49.2	47.8	50.6	55.1	69.9	9.5
7/25/2021	11:00 PM	48.8	47.8	50.1	53.3	69.7	8.1
7/26/2021	12:00 AM	45.5	44.9	47.2	49.8	67.3	6.1
7/26/2021	1:00 AM	44.7	43.1	46.4	49.1	68.7	8.3
7/26/2021	2:00 AM	45.0	43.5	47.5	50.4	70.8	7.5
7/26/2021	3:00 AM	43.2	44.1	47.1	49.9	57.4	8.9
7/26/2021	4:00 AM	49.3	48.1	50.3	53.0	73.0	8.9
7/26/2021	5:00 AM	54.6	51.3	55.0	64.1	74.7	5.8
7/26/2021	6:00 AM	60.8	58.1	66.4	69.9	81.7	5.8
7/26/2021	7:00 AM	55.6	51.3	56.9	65.0	78.1	7.2
7/26/2021	8:00 AM	54.5	51.0	56.8	64.1	74.7	6.9
7/26/2021	9:00 AM	53.9	50.6	55.5	62.9	73.8	6.4
7/26/2021	10:00 AM	54.2	49.7	55.6	63.1	79.6	5.8
7/26/2021	11:00 AM	54.0	50.5	57.3	63.8	69.8	5.8
7/26/2021	12:00 PM	54.7	49.3	57.9	64.6	74.7	6.1
7/26/2021	1:00 PM	55.7	50.0	58.3	65.0	80.5	6.1
7/26/2021	2:00 PM	55.0	50.3	57.5	64.4	76.1	5.8
7/26/2021	3:00 PM	54.8	51.4	57.5	64.0	75.2	6.9
7/26/2021	4:00 PM	55.7	53.0	58.3	64.3	78.9	6.7
7/26/2021	5:00 PM	55.7	53.1	58.5	64.6	77.6	6.1
7/26/2021	6:00 PM	53.5	50.0	55.3	63.0	73.8	5.5
7/26/2021	7:00 PM	52.4	49.1	51.8	60.3	76.4	4.7
7/26/2021	8:00 PM	54.6	49.5	56.3	63.3	77.0	6.1
7/26/2021	9:00 PM	50.5	48.0	50.7	58.0	70.9	5.5
7/26/2021	10:00 PM	49.3	45.7	47.8	53.0	78.2	6.9
7/26/2021	11:00 PM	48.5	45.1	48.0	51.5	77.3	7.5
7/27/2021	12:00 AM	44.6	43.4	45.3	48.4	67.8	8.9
7/27/2021	1:00 AM	45.9	42.4	44.8	47.6	76.1	4.9
7/27/2021	2:00 AM	44.8	42.3	45.9	51.2	70.4	4.6
7/27/2021	3:00 AM	43.4	43.6	46.1	48.2	69.2	6.9
7/27/2021	4:00 AM	49.3	46.2	48.5	53.2	75.2	4.4
7/27/2021	5:00 AM	53.7	48.9	54.3	63.5	75.0	5.5
7/27/2021	6:00 AM	60.3	57.6	66.3	69.5	76.3	4.9
7/27/2021	7:00 AM	55.4	50.9	57.4	64.8	76.1	5.0
7/27/2021	8:00 AM	55.2	51.5	56.5	64.1	77.6	4.9
7/27/2021	9:00 AM	54.8	51.2	56.7	63.9	77.2	5.3
7/27/2021	10:00 AM	54.1	48.5	55.8	63.5	78.3	6.4
7/27/2021	11:00 AM	55.7	52.5	59.2	65.5	75.5	4.7
7/27/2021	12:00 PM	52.9	46.8	55.8	63.2	71.3	3.7
7/27/2021	1:00 PM	55.8	49.6	59.3	65.1	79.9	3.1
7/27/2021	2:00 PM	55.7	49.4	58.7	64.9	80.0	3.1
7/27/2021	3:00 PM	56.0	51.9	60.4	65.1	79.6	1.7
7/27/2021	4:00 PM	55.7	51.6	59.4	65.2	77.5	5.5
7/27/2021	5:00 PM	55.9	51.4	59.9	65.5	74.1	3.7
7/27/2021	6:00 PM	52.0	49.0	52.1	60.6	72.6	6.3
7/27/2021	7:00 PM	53.7	50.1	53.1	62.0	79.1	8.6
7/27/2021	8:00 PM	52.3	50.7	53.2	59.6	71.7	9.2
7/27/2021	9:00 PM	50.5	48.8	51.7	58.0	72.1	8.3
7/27/2021	10:00 PM	48.2	47.6	49.5	52.1	69.0	8.9
7/27/2021	11:00 PM	48.2	46.1	48.6	52.6	73.1	8.6
7/28/2021	12:00 AM	47.7	46.5	49.0	51.6	71.9	6.7
7/28/2021	1:00 AM	47.3	46.8	49.5	52.3	69.1	6.4
7/28/2021	2:00 AM	46.0	46.0	49.0	51.7	68.6	5.8
7/28/2021	3:00 AM	45.5	45.7	48.7	51.2	68.7	4.4

7/28/2021	4:00 AM	50.9	49.0	51.2	54.5	75.7	3.7
7/28/2021	5:00 AM	55.3	51.9	56.3	65.0	74.4	4.0
7/28/2021	6:00 AM	61.2	58.9	67.1	70.0	78.6	5.5
7/28/2021	7:00 AM	55.5	51.5	56.9	64.7	77.4	4.7
7/28/2021	8:00 AM	53.6	50.0	53.9	62.2	75.5	4.4
7/28/2021	9:00 AM	53.9	49.4	55.5	63.3	74.6	3.7
7/28/2021	10:00 AM	55.5	49.8	58.6	65.0	79.8	4.0
7/28/2021	11:00 AM	54.1	48.9	57.7	64.1	72.6	4.0
7/28/2021	12:00 PM	54.5	47.9	57.6	64.1	81.0	2.8
7/28/2021	1:00 PM	54.6	48.6	58.1	64.3	77.4	1.4
7/28/2021	2:00 PM	54.2	47.7	57.9	64.5	73.0	2.5
7/28/2021	3:00 PM	55.8	49.8	59.9	65.1	76.7	2.5
7/28/2021	4:00 PM	55.6	50.2	59.7	65.4	74.1	3.7
7/28/2021	5:00 PM	56.5	51.7	60.6	66.1	77.5	4.0
7/28/2021	6:00 PM	54.5	50.4	54.6	63.2	78.6	7.2
7/28/2021	7:00 PM	56.1	49.6	54.1	62.7	88.6	7.2
7/28/2021	8:00 PM	52.2	49.6	52.9	60.6	74.3	10.0
7/28/2021	9:00 PM	50.9	48.3	50.7	57.0	75.2	9.5
7/28/2021	10:00 PM	50.8	47.2	50.1	56.8	77.7	8.6
7/28/2021	11:00 PM	46.7	45.3	47.4	50.1	70.1	7.5
7/29/2021	12:00 AM	47.1	44.4	46.7	51.1	73.7	7.5
7/29/2021	1:00 AM	47.3	46.1	48.8	52.3	68.7	8.1
7/29/2021	2:00 AM	44.4	44.4	47.1	49.3	67.9	6.7
7/29/2021	3:00 AM	46.6	46.7	49.0	51.4	70.3	3.7
7/29/2021	4:00 AM	50.4	48.7	50.3	53.5	74.6	4.6
7/29/2021	5:00 AM	56.3	51.2	56.7	65.3	79.7	4.7
7/29/2021	6:00 AM	60.6	57.8	66.5	69.6	82.0	5.5
7/29/2021	7:00 AM	55.4	51.7	56.9	64.7	76.0	5.0
7/29/2021	8:00 AM	55.2	52.0	56.7	64.1	75.9	5.0
7/29/2021	9:00 AM	53.7	50.2	54.7	63.0	73.2	3.7
7/29/2021	10:00 AM	54.2	49.4	56.4	63.9	75.9	5.0
7/29/2021	11:00 AM	54.9	49.9	58.1	64.5	75.1	3.7
7/29/2021	12:00 PM	54.8	48.2	57.7	64.1	78.8	2.2
7/29/2021	1:00 PM	54.4	48.8	58.4	64.4	77.0	0.0
7/29/2021	2:00 PM	54.9	48.0	58.8	64.6	75.5	0.6
7/29/2021	3:00 PM	55.1	49.8	59.0	64.9	75.9	3.4
7/29/2021	4:00 PM	56.1	51.1	60.1	65.5	78.2	4.0
7/29/2021	5:00 PM	54.8	51.0	58.1	64.7	74.1	4.3
7/29/2021	6:00 PM	53.3	50.1	55.2	62.7	72.6	6.1
7/29/2021	7:00 PM	53.4	49.4	55.9	62.8	72.0	7.8
7/29/2021	8:00 PM	53.2	49.6	55.5	62.2	74.4	9.2
7/29/2021	9:00 PM	51.2	47.9	51.4	60.0	72.3	10.0
7/29/2021	10:00 PM	47.4	46.2	48.2	54.1	67.5	10.0
7/29/2021	11:00 PM	48.5	47.1	49.6	53.6	70.4	9.5
7/30/2021	12:00 AM	48.0	46.2	48.4	51.0	75.7	7.8
7/30/2021	1:00 AM	46.5	44.0	46.5	49.6	73.3	7.2
7/30/2021	2:00 AM	43.1	42.4	44.6	47.8	67.8	4.0
7/30/2021	3:00 AM	45.1	44.4	47.9	50.6	69.3	3.1
7/30/2021	4:00 AM	50.4	46.7	49.0	55.4	74.4	3.4
7/30/2021	5:00 AM	54.3	48.9	51.8	60.3	82.0	3.4
7/30/2021	6:00 AM	56.0	50.5	58.7	66.3	74.3	4.0
7/30/2021	7:00 AM	54.8	50.4	56.5	64.3	75.3	3.4
7/30/2021	8:00 AM	54.7	48.9	56.3	64.4	77.3	3.1
7/30/2021	9:00 AM	54.9	48.7	57.3	64.5	77.1	3.7
7/30/2021	10:00 AM	54.2	48.6	57.4	64.4	77.1	3.4
7/30/2021	11:00 AM	54.5	48.8	58.4	64.7	76.3	3.4

Notes

1. $L_{2.5}$ = Level exceeded 2.5% (1.5 minutes) per hour
   $L_{8.3}$ = Level exceeded 8.3% (5 minutes) per hour
   L_{25} = Level exceeded 25% (15 minutes) per hour
   L_{max} = Maximum noise level measured (including impulsive noise)

TABLE C-2: Hourly Noise Level Data, NE Site

Whitmarsh Heronry, Anacortes, WA

Date	Time	Hourly Ambient Noise Levels (dBA)					
		L_{eq}	L_{25}	$L_{8.33}$	$L_{2.5}$	L_{max}	Wind Speed (mph)
4/9/2021	3:00 PM	54.1	54.9	56.1	57.2	67.1	5.8
4/9/2021	4:00 PM	54.0	54.7	55.9	57.1	66.3	7.2
4/9/2021	5:00 PM	54.1	54.9	56.1	56.9	66.6	8.9
4/9/2021	6:00 PM	53.6	54.5	55.6	56.7	66.1	9.5
4/9/2021	7:00 PM	54.0	54.6	56.3	58.5	70.1	11.5
4/9/2021	8:00 PM	53.6	54.0	55.8	57.6	74.0	12.0
4/9/2021	9:00 PM	51.7	52.5	54.0	55.6	63.9	11.8
4/9/2021	10:00 PM	55.0	50.2	51.3	53.2	82.7	14.7
4/9/2021	11:00 PM	48.2	48.7	49.7	50.7	58.8	13.9
4/10/2021	12:00 AM	55.5	48.8	50.5	53.6	84.7	14.7
4/10/2021	1:00 AM	49.6	49.5	51.6	55.1	73.5	14.7
4/10/2021	2:00 AM	53.3	53.2	56.0	59.7	72.0	19.0
4/10/2021	3:00 AM	51.2	47.7	50.0	54.4	78.8	22.2
4/10/2021	4:00 AM	56.2	48.3	53.6	58.6	78.9	19.4
4/10/2021	5:00 AM	49.1	49.1	50.8	54.1	68.4	11.8
4/10/2021	6:00 AM	49.2	49.9	51.3	52.4	61.6	7.8
4/10/2021	7:00 AM	59.4	51.1	57.8	64.4	81.0	5.5
4/10/2021	8:00 AM	48.4	49.1	50.6	51.6	67.1	16.1
4/10/2021	9:00 AM	48.3	49.0	50.7	52.2	66.4	20.7
4/10/2021	10:00 AM	46.5	46.8	48.3	50.3	66.4	20.5
4/10/2021	11:00 AM	45.3	45.9	47.6	49.9	58.6	15.5
4/10/2021	12:00 PM	46.5	47.1	49.1	51.0	63.2	15.3
4/10/2021	1:00 PM	46.2	46.2	49.1	52.2	66.3	12.6
4/10/2021	2:00 PM	44.1	45.1	47.4	49.4	60.3	10.3
4/10/2021	3:00 PM	44.1	43.9	46.1	48.7	66.9	11.7
4/10/2021	4:00 PM	46.6	47.4	48.9	50.2	65.2	11.1
4/10/2021	5:00 PM	43.1	43.4	46.1	48.5	70.1	9.2
4/10/2021	6:00 PM	43.8	44.9	46.8	48.1	62.0	6.9
4/10/2021	7:00 PM	43.8	43.1	45.1	47.5	70.3	8.1
4/10/2021	8:00 PM	57.8	47.6	49.7	57.0	87.6	11.5
4/10/2021	9:00 PM	47.8	48.3	49.7	51.3	62.5	6.4
4/10/2021	10:00 PM	47.1	47.5	48.3	49.0	55.7	9.7
4/10/2021	11:00 PM	46.3	47.2	48.9	50.3	58.6	7.5
4/11/2021	12:00 AM	49.4	46.5	50.0	58.2	70.7	5.8
4/11/2021	1:00 AM	43.1	44.0	46.2	48.0	53.9	5.3
4/11/2021	2:00 AM	40.6	41.7	43.8	45.7	53.8	6.9
4/11/2021	3:00 AM	62.2	41.7	58.5	69.0	85.4	2.3
4/11/2021	4:00 AM	41.8	42.7	45.0	47.0	55.3	2.2
4/11/2021	5:00 AM	45.6	46.8	48.9	50.3	60.2	1.7
4/11/2021	6:00 AM	47.5	48.2	50.1	51.8	64.8	2.0
4/11/2021	7:00 AM	47.9	48.7	50.2	51.5	65.6	2.0
4/11/2021	8:00 AM	46.0	45.9	47.8	49.6	75.4	1.7
4/11/2021	9:00 AM	46.9	45.2	50.9	55.6	68.5	1.7
4/11/2021	10:00 AM	44.5	43.1	46.5	52.1	65.4	3.2
4/11/2021	11:00 AM	42.4	40.3	43.4	48.6	73.2	8.6
4/11/2021	12:00 PM	43.4	41.3	43.6	48.0	64.9	4.3
4/11/2021	1:00 PM	42.3	42.2	44.1	46.2	68.3	2.0
4/11/2021	2:00 PM	46.2	43.8	46.6	53.2	65.7	2.0
4/11/2021	3:00 PM	46.4	46.6	49.3	51.7	72.9	2.0
4/11/2021	4:00 PM	54.6	49.6	55.2	59.2	83.9	1.7
4/11/2021	5:00 PM	42.4	42.6	43.7	45.0	67.9	1.7
4/11/2021	6:00 PM	43.0	42.3	44.2	47.2	63.3	5.5
4/11/2021	7:00 PM	44.9	42.3	45.3	52.7	69.0	10.0
4/11/2021	8:00 PM	58.8	42.9	45.5	52.6	91.1	11.5
4/11/2021	9:00 PM	41.8	42.3	43.7	45.7	49.7	13.0
4/11/2021	10:00 PM	39.4	40.1	41.4	43.1	51.8	13.3
4/11/2021	11:00 PM	39.2	39.2	40.9	44.2	54.6	13.9

4/12/2021	12:00 AM	38.6	39.0	40.4	42.7	50.0	13.0
4/12/2021	1:00 AM	57.0	43.0	46.0	61.7	82.4	12.8
4/12/2021	2:00 AM	38.1	39.0	41.2	43.1	52.2	11.7
4/12/2021	3:00 AM	40.5	41.7	43.4	45.0	51.5	9.7
4/12/2021	4:00 AM	44.0	44.7	46.3	48.1	58.1	10.3
4/12/2021	5:00 AM	48.4	48.0	49.6	51.4	71.2	7.8
4/12/2021	6:00 AM	55.6	51.3	57.5	62.1	79.4	5.5
4/12/2021	7:00 AM	46.4	47.0	49.7	51.8	70.2	3.1
4/12/2021	8:00 AM	42.8	43.1	44.7	46.7	70.4	1.4
4/12/2021	9:00 AM	50.4	43.3	47.2	59.9	75.9	3.5
4/12/2021	10:00 AM	55.2	44.6	52.5	64.1	81.1	0.3
4/12/2021	11:00 AM	43.1	43.4	45.3	47.6	66.0	3.4
4/12/2021	12:00 PM	45.0	44.9	46.7	50.2	64.1	0.6
4/12/2021	1:00 PM	61.0	46.5	56.1	65.7	89.1	2.6
4/12/2021	2:00 PM	55.3	46.5	51.4	61.6	82.7	2.5
4/12/2021	3:00 PM	54.2	47.3	52.4	62.5	81.5	3.7
4/12/2021	4:00 PM	47.4	47.2	48.9	52.9	67.3	4.9
4/12/2021	5:00 PM	52.3	47.7	50.6	57.1	77.1	10.0
4/12/2021	6:00 PM	45.1	44.3	46.5	50.5	67.6	9.2
4/12/2021	7:00 PM	43.5	43.8	45.2	46.8	63.3	15.3
4/12/2021	8:00 PM	50.5	42.5	45.0	49.8	83.6	19.6
4/12/2021	9:00 PM	39.6	40.0	41.6	43.2	53.5	20.2
4/12/2021	10:00 PM	39.5	40.1	41.7	43.1	55.4	17.8
4/12/2021	11:00 PM	37.5	37.7	40.3	43.0	50.2	15.3
4/13/2021	12:00 AM	37.3	38.1	40.3	42.1	49.3	13.6
4/13/2021	1:00 AM	49.2	40.5	44.1	49.6	72.8	12.8
4/13/2021	2:00 AM	39.5	40.3	42.4	44.3	51.9	9.7
4/13/2021	3:00 AM	39.2	40.0	41.8	43.7	56.9	6.1
4/13/2021	4:00 AM	41.7	42.0	44.3	47.1	53.8	6.9
4/13/2021	5:00 AM	60.4	50.3	58.0	68.0	82.0	6.4
4/13/2021	6:00 AM	50.2	51.0	52.7	54.2	65.1	6.4
4/13/2021	7:00 AM	49.1	49.8	52.1	54.2	66.4	8.1
4/13/2021	8:00 AM	47.6	46.7	50.9	53.2	69.5	10.3
4/13/2021	9:00 AM	59.5	45.9	52.3	65.0	88.0	9.5
4/13/2021	10:00 AM	48.0	45.6	51.4	56.0	68.1	7.2
4/13/2021	11:00 AM	46.2	44.4	47.1	51.9	69.2	4.3
4/13/2021	12:00 PM	43.6	43.7	45.5	47.8	63.2	4.4
4/13/2021	1:00 PM	48.3	45.6	48.4	54.6	70.9	4.6
4/13/2021	2:00 PM	46.6	46.3	48.8	52.8	64.8	3.1
4/13/2021	3:00 PM	52.4	47.6	52.7	61.1	73.7	4.0
4/13/2021	4:00 PM	48.0	48.1	50.1	51.7	72.5	6.7
4/13/2021	5:00 PM	47.5	47.7	49.4	51.7	69.7	9.2
4/13/2021	6:00 PM	53.2	47.1	49.1	57.4	76.4	10.0
4/13/2021	7:00 PM	45.9	46.1	48.5	50.7	64.0	12.6
4/13/2021	8:00 PM	62.9	46.4	51.1	62.8	94.7	16.7
4/13/2021	9:00 PM	44.5	44.9	45.6	46.3	57.9	17.5
4/13/2021	10:00 PM	49.0	43.9	44.7	46.8	77.4	18.1
4/13/2021	11:00 PM	44.1	42.7	44.1	47.0	68.8	17.2
4/14/2021	12:00 AM	52.6	41.4	43.8	55.3	81.5	16.7
4/14/2021	1:00 AM	39.5	40.3	42.2	43.9	52.9	15.3
4/14/2021	2:00 AM	43.2	44.9	46.2	47.6	57.6	17.8
4/14/2021	3:00 AM	42.0	42.9	45.0	46.6	54.0	17.8
4/14/2021	4:00 AM	55.5	50.6	55.1	60.5	85.5	14.1
4/14/2021	5:00 AM	60.5	50.7	53.3	59.4	86.1	11.8
4/14/2021	6:00 AM	56.7	54.4	57.2	65.0	76.4	9.2
4/14/2021	7:00 AM	51.0	51.8	53.5	55.0	67.9	6.1
4/14/2021	8:00 AM	47.5	47.7	50.9	53.7	62.7	6.7
4/14/2021	9:00 AM	56.4	47.1	53.7	60.7	85.3	5.8
4/14/2021	10:00 AM	50.1	45.4	49.4	55.7	81.8	4.3
4/14/2021	11:00 AM	47.1	43.8	47.6	56.3	68.0	3.2
4/14/2021	12:00 PM	49.6	43.9	46.5	50.8	78.9	0.3
4/14/2021	1:00 PM	46.8	46.9	49.0	51.6	67.7	1.7
4/14/2021	2:00 PM	47.4	46.9	49.9	53.1	71.5	1.7

4/14/2021	3:00 PM	47.5	45.3	49.2	55.7	67.8	0.3
4/14/2021	4:00 PM	44.9	45.3	47.2	49.7	71.3	4.6
4/14/2021	5:00 PM	46.3	46.5	48.8	51.7	65.4	6.1
4/14/2021	6:00 PM	44.9	44.8	46.1	49.0	65.0	9.2
4/14/2021	7:00 PM	49.7	46.4	50.9	55.5	83.7	16.9
4/14/2021	8:00 PM	53.9	47.9	49.6	53.5	84.6	16.4
4/14/2021	9:00 PM	45.6	45.4	47.4	50.0	67.3	16.7
4/14/2021	10:00 PM	46.8	47.9	49.9	51.4	57.2	17.5
4/14/2021	11:00 PM	46.9	47.7	49.5	51.6	59.9	16.7
4/15/2021	12:00 AM	57.3	45.4	47.7	55.8	89.4	16.1
4/15/2021	1:00 AM	43.4	44.0	45.5	46.9	53.9	12.4
4/15/2021	2:00 AM	41.0	41.6	43.8	45.6	63.0	11.5
4/29/2021	12:00 PM	43.7	41.3	42.8	44.7	76.7	2.3
4/29/2021	1:00 PM	56.1	41.7	45.7	55.1	85.4	1.7
4/29/2021	2:00 PM	42.1	41.5	43.6	48.6	60.6	0.3
4/29/2021	3:00 PM	44.6	44.0	45.8	47.9	69.4	3.8
4/29/2021	4:00 PM	45.4	45.0	46.7	48.8	70.2	4.0
4/29/2021	5:00 PM	47.3	47.4	48.8	51.7	65.1	5.5
4/29/2021	6:00 PM	47.8	47.5	49.0	51.0	78.3	7.5
4/29/2021	7:00 PM	49.4	50.3	51.5	52.7	61.9	6.7
4/29/2021	8:00 PM	54.4	50.9	52.1	56.3	81.4	6.7
4/29/2021	9:00 PM	48.4	49.0	50.0	50.8	55.3	6.9
4/29/2021	10:00 PM	49.3	49.0	50.1	51.2	73.3	8.3
4/29/2021	11:00 PM	45.5	46.7	48.6	49.7	56.1	9.5
4/30/2021	12:00 AM	44.2	45.0	47.4	49.4	65.7	6.4
4/30/2021	1:00 AM	44.2	45.0	47.3	49.5	61.0	3.7
4/30/2021	2:00 AM	49.3	43.8	46.2	50.6	73.0	5.8
4/30/2021	3:00 AM	44.1	45.0	46.6	48.7	53.5	4.3
4/30/2021	4:00 AM	46.3	47.3	49.8	51.7	64.7	5.2
4/30/2021	5:00 AM	54.0	52.9	55.4	59.6	80.2	5.3
4/30/2021	6:00 AM	53.1	54.1	55.4	56.6	72.9	6.1
4/30/2021	7:00 AM	53.4	54.2	55.6	56.9	71.3	6.1
4/30/2021	8:00 AM	53.1	53.7	55.2	56.4	72.9	5.3
4/30/2021	9:00 AM	51.9	52.8	54.3	55.4	66.2	1.1
4/30/2021	10:00 AM	52.4	52.5	53.9	55.4	74.0	1.7
4/30/2021	11:00 AM	51.7	52.2	53.8	55.6	68.5	4.0
4/30/2021	12:00 PM	53.9	51.8	53.2	55.2	81.2	6.7
4/30/2021	1:00 PM	50.7	50.8	52.6	55.7	68.7	10.0
4/30/2021	2:00 PM	49.6	50.4	52.0	53.1	62.5	9.7
4/30/2021	3:00 PM	49.2	48.3	50.0	52.6	71.1	10.8
4/30/2021	4:00 PM	47.0	47.8	49.0	49.9	59.2	11.5
4/30/2021	5:00 PM	48.2	48.6	50.5	52.6	67.5	10.6
4/30/2021	6:00 PM	49.9	50.5	52.1	54.4	70.6	8.9
4/30/2021	7:00 PM	52.6	51.1	52.2	54.0	78.0	9.7
4/30/2021	8:00 PM	50.6	51.1	52.1	53.2	66.2	11.7
4/30/2021	9:00 PM	50.4	51.0	52.0	52.8	62.8	9.5
4/30/2021	10:00 PM	48.4	48.9	50.2	51.3	55.6	8.3
4/30/2021	11:00 PM	47.4	48.1	49.1	50.3	59.1	7.8
5/1/2021	12:00 AM	42.4	42.7	44.5	46.7	63.9	7.8
5/1/2021	1:00 AM	41.6	42.5	44.5	45.8	56.6	8.6
5/1/2021	2:00 AM	53.8	43.5	45.3	51.1	78.6	5.8
5/1/2021	3:00 AM	42.7	43.4	44.8	46.1	53.6	3.1
5/1/2021	4:00 AM	62.1	45.7	59.0	68.4	85.1	4.0
5/1/2021	5:00 AM	63.1	48.9	56.8	70.5	88.1	2.8
5/1/2021	6:00 AM	44.4	44.7	46.4	49.2	59.9	5.8
5/1/2021	7:00 AM	44.6	44.3	46.1	47.9	69.9	5.7
5/1/2021	8:00 AM	45.0	44.5	46.3	48.7	64.0	7.5
5/1/2021	9:00 AM	49.3	49.7	51.5	53.5	78.4	2.9
5/1/2021	10:00 AM	49.9	50.5	51.7	52.8	72.9	5.5
5/1/2021	11:00 AM	49.2	49.8	51.1	52.6	61.2	2.3
5/1/2021	12:00 PM	49.4	50.1	51.4	52.6	63.6	3.1
5/1/2021	1:00 PM	50.2	50.9	52.0	52.9	64.7	3.1
5/1/2021	2:00 PM	49.8	50.5	51.7	52.7	63.3	3.1

5/1/2021	3:00 PM	49.0	49.5	51.2	53.0	66.5	4.4
5/1/2021	4:00 PM	48.5	48.9	50.3	52.0	66.7	5.5
5/1/2021	5:00 PM	49.4	49.2	50.6	52.5	72.7	7.2
5/1/2021	6:00 PM	50.4	47.9	49.5	52.1	75.9	9.2
5/1/2021	7:00 PM	48.5	48.9	50.5	52.6	66.3	12.8
5/1/2021	8:00 PM	53.1	48.4	49.9	53.0	83.5	14.1
5/1/2021	9:00 PM	46.4	47.1	48.3	49.4	55.6	13.6
5/1/2021	10:00 PM	45.0	45.7	47.0	48.3	66.8	13.3
5/1/2021	11:00 PM	43.9	44.6	46.1	47.6	58.2	10.3
5/2/2021	12:00 AM	43.0	43.6	44.8	46.0	53.0	9.5
5/2/2021	1:00 AM	42.9	43.5	44.9	46.1	52.4	8.3
5/2/2021	2:00 AM	40.8	41.5	42.8	44.4	53.3	8.9
5/2/2021	3:00 AM	51.1	42.0	44.7	57.0	75.0	6.7
5/2/2021	4:00 AM	56.7	44.3	55.9	61.2	82.2	3.7
5/2/2021	5:00 AM	50.5	46.5	50.1	56.2	83.9	4.4
5/2/2021	6:00 AM	53.8	49.1	53.1	58.3	78.5	3.7
5/2/2021	7:00 AM	48.7	47.0	51.6	56.3	68.1	3.7
5/2/2021	8:00 AM	43.9	44.5	46.2	48.1	60.5	6.1
5/2/2021	9:00 AM	46.3	46.8	48.3	49.8	66.0	4.0
5/2/2021	10:00 AM	47.1	46.7	48.9	51.9	65.7	5.0
5/2/2021	11:00 AM	49.2	48.8	51.3	56.5	65.8	4.0
5/2/2021	12:00 PM	44.3	43.4	46.7	51.1	67.4	5.3
5/2/2021	1:00 PM	51.0	45.5	52.0	60.0	72.5	4.4
5/2/2021	2:00 PM	41.5	39.9	44.7	49.8	61.7	5.0
5/2/2021	3:00 PM	46.0	40.0	44.3	53.1	71.8	5.2
5/2/2021	4:00 PM	44.6	43.0	45.2	48.9	66.5	4.0
5/2/2021	5:00 PM	47.1	47.1	48.8	51.7	64.9	4.6
5/2/2021	6:00 PM	45.9	46.5	48.2	50.1	64.8	5.3
5/2/2021	7:00 PM	47.3	47.5	48.8	50.5	65.5	3.4
5/2/2021	8:00 PM	47.9	47.4	49.0	52.1	66.4	5.8
5/2/2021	9:00 PM	46.3	46.6	47.9	49.3	63.4	6.7
5/2/2021	10:00 PM	52.7	46.8	48.3	51.4	76.2	5.8
5/2/2021	11:00 PM	45.9	46.6	48.0	49.5	57.1	5.8
5/3/2021	12:00 AM	44.3	45.2	46.8	48.4	57.6	6.4
5/3/2021	1:00 AM	43.3	43.7	45.7	47.6	60.3	6.9
5/3/2021	2:00 AM	41.6	42.3	43.4	44.5	50.2	6.7
5/3/2021	3:00 AM	48.9	43.4	45.5	51.3	72.4	4.0
5/3/2021	4:00 AM	53.1	49.5	56.8	59.3	77.7	2.2
5/3/2021	5:00 AM	53.8	53.4	56.6	60.8	76.9	4.4
5/3/2021	6:00 AM	53.2	54.1	55.5	56.8	64.2	3.5
5/3/2021	7:00 AM	50.5	51.4	52.9	54.2	60.0	3.1
5/3/2021	8:00 AM	49.8	50.6	52.5	54.3	67.4	2.8
5/3/2021	9:00 AM	50.1	50.5	52.3	54.5	65.0	3.1
5/3/2021	10:00 AM	52.1	51.3	53.4	56.3	73.5	4.0
5/3/2021	11:00 AM	50.4	51.2	52.7	54.2	61.0	4.7
5/3/2021	12:00 PM	51.0	51.4	53.0	54.5	80.5	5.0
5/3/2021	1:00 PM	52.2	52.2	54.3	57.2	70.6	3.1
5/3/2021	2:00 PM	51.0	51.2	52.9	55.1	77.3	3.1
5/3/2021	3:00 PM	51.7	52.4	54.1	55.5	65.0	6.6
5/3/2021	4:00 PM	50.7	51.6	52.9	54.1	65.1	8.9
5/3/2021	5:00 PM	51.6	52.3	54.0	55.6	69.5	8.6
5/3/2021	6:00 PM	53.4	53.0	56.8	60.9	68.2	8.9
5/3/2021	7:00 PM	50.1	49.6	52.9	57.5	67.1	9.7
5/3/2021	8:00 PM	48.0	48.4	50.7	53.8	63.2	9.7
5/3/2021	9:00 PM	50.0	45.8	47.9	52.7	72.9	7.8
5/3/2021	10:00 PM	43.5	44.1	46.4	48.2	58.2	9.2
5/3/2021	11:00 PM	42.1	43.0	45.4	47.2	53.0	8.9
5/4/2021	12:00 AM	39.5	40.1	41.8	43.0	50.3	8.9
5/4/2021	1:00 AM	42.2	43.0	44.2	44.9	51.0	8.9
5/4/2021	2:00 AM	51.0	43.6	45.4	51.5	75.0	7.5
5/4/2021	3:00 AM	41.7	42.2	43.4	44.8	57.3	6.7
5/4/2021	4:00 AM	39.5	39.6	42.1	44.6	53.6	5.3
5/4/2021	5:00 AM	50.5	48.7	53.9	59.8	67.0	3.4

5/4/2021	6:00 AM	47.8	48.5	50.2	51.6	63.4	4.0
5/4/2021	7:00 AM	47.3	48.1	50.0	51.7	65.0	2.8
5/4/2021	8:00 AM	47.2	47.5	49.1	51.0	64.7	4.3
5/4/2021	9:00 AM	48.0	47.0	48.6	51.7	68.2	4.7
5/4/2021	10:00 AM	46.6	47.4	48.9	50.1	59.7	3.7
5/4/2021	11:00 AM	49.3	48.0	49.3	51.4	71.7	1.7
5/4/2021	12:00 PM	47.8	47.8	49.4	51.0	68.2	2.0
5/4/2021	1:00 PM	47.7	47.3	49.4	53.8	65.6	4.1
5/4/2021	2:00 PM	47.7	48.1	49.4	50.7	63.8	5.3
5/4/2021	3:00 PM	48.6	48.9	50.0	51.6	67.6	2.5
5/4/2021	4:00 PM	50.1	47.9	49.2	51.6	73.0	3.1
5/4/2021	5:00 PM	47.9	48.4	49.9	51.3	65.7	3.1
5/4/2021	6:00 PM	48.7	48.1	50.6	55.0	67.7	3.4
5/4/2021	7:00 PM	47.3	47.8	49.2	50.9	63.0	5.3
5/4/2021	8:00 PM	48.8	49.3	50.6	52.0	69.2	4.9
5/4/2021	9:00 PM	51.7	49.2	50.3	53.6	80.9	6.9
5/4/2021	10:00 PM	46.6	46.1	48.1	50.2	69.6	7.8
5/4/2021	11:00 PM	45.3	45.9	48.2	50.2	59.2	8.6
5/5/2021	12:00 AM	43.5	44.2	46.1	47.6	54.8	9.2
5/5/2021	1:00 AM	47.5	43.6	46.9	50.6	68.0	8.6
5/5/2021	2:00 AM	58.0	44.5	48.2	64.3	84.4	6.7
5/5/2021	3:00 AM	58.4	41.7	46.3	62.1	86.4	4.9
5/5/2021	4:00 AM	48.5	47.0	49.7	53.7	69.2	2.2
5/5/2021	5:00 AM	50.4	50.8	52.3	54.1	69.2	2.8
5/5/2021	6:00 AM	50.4	50.3	52.0	55.2	68.6	1.4
5/5/2021	7:00 AM	46.3	47.0	48.8	50.4	65.4	0.6
5/5/2021	8:00 AM	46.3	46.9	48.6	50.2	61.0	1.1
5/5/2021	9:00 AM	46.6	46.7	48.5	50.0	77.3	0.6
5/5/2021	10:00 AM	45.9	44.1	45.9	48.8	72.9	1.1
5/5/2021	11:00 AM	56.6	43.5	46.9	59.1	83.7	2.0
5/5/2021	12:00 PM	50.9	45.9	50.5	57.4	77.9	1.4
5/5/2021	1:00 PM	46.0	46.6	48.2	49.7	66.1	2.6
5/5/2021	2:00 PM	45.7	45.3	47.0	48.9	68.6	2.0
5/5/2021	3:00 PM	45.5	45.1	46.3	48.9	65.3	5.5
5/5/2021	4:00 PM	46.0	45.2	46.9	51.6	63.5	5.5
5/5/2021	5:00 PM	47.4	45.8	47.5	50.7	82.4	8.9
5/5/2021	6:00 PM	46.7	46.0	47.6	51.4	69.8	10.0
5/5/2021	7:00 PM	45.9	45.5	47.3	50.3	68.2	9.2
5/5/2021	8:00 PM	44.6	44.8	46.4	48.5	62.9	8.3
5/5/2021	9:00 PM	43.6	44.1	45.7	47.2	59.2	10.3
5/5/2021	10:00 PM	50.0	44.4	46.0	48.4	73.0	15.0
5/5/2021	11:00 PM	42.9	43.8	45.5	47.3	53.7	12.1
5/6/2021	12:00 AM	41.3	42.0	44.5	46.5	55.7	13.0
5/6/2021	1:00 AM	48.5	42.5	45.5	49.0	75.7	11.5
5/6/2021	2:00 AM	40.6	41.2	44.2	46.7	54.1	9.2
5/6/2021	3:00 AM	42.8	44.0	46.4	48.3	57.8	8.1
5/6/2021	4:00 AM	54.3	49.5	57.3	62.1	82.7	6.7
5/6/2021	5:00 AM	50.9	51.2	52.6	54.3	68.5	8.6
5/6/2021	6:00 AM	51.7	51.5	53.0	56.4	68.7	9.2
5/6/2021	7:00 AM	51.8	52.5	54.1	55.6	73.1	6.9
5/6/2021	8:00 AM	51.7	52.5	53.8	55.0	63.6	4.0
5/6/2021	9:00 AM	51.4	52.1	53.7	55.2	66.4	2.9
5/6/2021	10:00 AM	51.5	52.2	53.9	55.4	62.4	1.7
5/6/2021	11:00 AM	52.4	53.1	54.8	56.3	63.7	2.2
5/6/2021	12:00 PM	54.1	54.4	56.1	58.7	74.3	2.8
5/6/2021	1:00 PM	54.7	55.1	56.8	58.9	72.8	4.9
5/6/2021	2:00 PM	52.5	53.2	54.7	56.1	65.0	5.5
5/6/2021	3:00 PM	55.1	54.1	56.0	58.0	78.2	6.3
5/6/2021	4:00 PM	54.9	55.4	56.9	58.4	75.3	12.1
5/6/2021	5:00 PM	54.8	54.3	56.0	58.0	75.3	16.4
5/6/2021	6:00 PM	51.2	52.0	53.3	54.8	69.4	17.8
5/6/2021	7:00 PM	49.4	48.4	50.3	53.5	75.4	22.5
5/6/2021	8:00 PM	55.4	53.6	56.6	58.0	82.9	24.4
5/6/2021	9:00 PM	48.8	50.2	51.9	53.1	65.2	23.0

5/6/2021	10:00 PM	48.8	49.6	51.3	52.4	60.4	21.6
5/6/2021	11:00 PM	46.1	47.3	49.1	50.4	61.5	17.3
5/7/2021	12:00 AM	49.4	50.4	52.3	54.2	62.3	16.9
5/7/2021	1:00 AM	45.8	46.6	50.0	52.1	57.0	17.3
5/7/2021	2:00 AM	47.5	43.8	47.3	54.8	68.9	11.5
5/7/2021	3:00 AM	43.9	44.8	47.4	49.6	59.6	6.4
5/7/2021	4:00 AM	59.0	49.3	54.1	61.3	85.2	3.1
5/7/2021	5:00 AM	57.3	50.5	52.4	57.7	81.4	3.7
5/7/2021	6:00 AM	50.9	50.6	53.0	57.8	71.7	5.0
5/7/2021	7:00 AM	51.4	52.0	53.7	55.8	66.9	4.4
5/7/2021	8:00 AM	49.7	50.2	52.2	54.0	69.3	6.4
5/7/2021	9:00 AM	48.7	49.0	50.5	52.0	70.7	5.8
5/7/2021	10:00 AM	50.3	50.8	52.1	53.4	66.3	4.4
5/28/2021	11:00 AM	50.8	48.9	50.5	54.3	76.5	8.1
5/28/2021	12:00 PM	48.9	49.3	50.6	52.6	66.1	9.5
5/28/2021	1:00 PM	49.3	49.2	50.6	53.3	65.3	6.9
5/28/2021	2:00 PM	52.1	48.9	50.4	54.5	81.0	9.5
5/28/2021	3:00 PM	49.5	49.6	51.1	53.6	66.3	10.6
5/28/2021	4:00 PM	49.6	49.7	51.4	54.3	69.3	10.9
5/28/2021	5:00 PM	49.4	49.5	51.3	54.0	64.3	6.7
5/28/2021	6:00 PM	48.1	48.2	50.6	53.3	62.6	5.2
5/28/2021	7:00 PM	48.4	47.9	50.7	54.9	63.8	6.1
5/28/2021	8:00 PM	48.1	47.0	48.7	51.4	74.3	8.9
5/28/2021	9:00 PM	45.6	46.2	47.6	49.2	61.0	8.6
5/28/2021	10:00 PM	49.1	46.6	48.7	54.6	69.6	9.7
5/28/2021	11:00 PM	46.2	46.8	48.4	50.2	58.3	10.3
5/29/2021	12:00 AM	46.5	47.1	48.6	50.1	54.8	10.8
5/29/2021	1:00 AM	43.7	44.2	45.4	46.5	59.7	9.7
5/29/2021	2:00 AM	42.6	43.1	45.6	47.9	56.6	6.4
5/29/2021	3:00 AM	49.7	44.3	47.0	51.6	71.7	3.7
5/29/2021	4:00 AM	46.4	46.0	49.8	54.0	63.1	1.1
5/29/2021	5:00 AM	46.1	46.8	48.6	50.2	57.8	2.2
5/29/2021	6:00 AM	47.8	48.2	49.9	53.1	68.0	2.2
5/29/2021	7:00 AM	44.7	43.5	45.5	49.4	66.5	3.4
5/29/2021	8:00 AM	42.8	42.3	44.4	47.5	65.5	1.1
5/29/2021	9:00 AM	42.9	42.3	44.9	49.9	62.4	0.8
5/29/2021	10:00 AM	43.2	41.3	44.4	49.5	66.1	0.8
5/29/2021	11:00 AM	42.9	42.5	45.3	48.7	61.7	1.4
5/29/2021	12:00 PM	44.8	42.6	46.1	49.5	71.2	2.2
5/29/2021	1:00 PM	46.9	43.9	49.9	55.4	67.8	4.9
5/29/2021	2:00 PM	44.8	43.2	47.8	52.7	65.3	4.9
5/29/2021	3:00 PM	44.6	42.4	46.3	51.4	66.8	4.0
5/29/2021	4:00 PM	47.6	42.7	49.6	53.9	81.9	6.4
5/29/2021	5:00 PM	45.7	43.8	50.0	54.1	63.7	8.1
5/29/2021	6:00 PM	46.0	44.4	50.0	53.4	65.1	8.6
5/29/2021	7:00 PM	47.6	45.4	51.0	54.8	74.1	9.7
5/29/2021	8:00 PM	49.0	47.7	51.2	54.5	74.3	12.8
5/29/2021	9:00 PM	52.6	48.9	51.2	54.8	75.8	12.4
5/29/2021	10:00 PM	59.6	48.3	59.8	69.2	82.3	11.4
5/29/2021	11:00 PM	46.2	46.9	48.5	50.1	55.6	11.5
5/30/2021	12:00 AM	45.6	46.3	48.3	50.1	65.0	12.1
5/30/2021	1:00 AM	45.9	46.0	48.7	51.3	67.1	9.7
5/30/2021	2:00 AM	52.9	45.2	48.2	56.9	79.0	8.1
5/30/2021	3:00 AM	41.6	41.8	45.1	49.1	56.1	5.3
5/30/2021	4:00 AM	46.1	46.4	49.2	53.7	65.0	3.4
5/30/2021	5:00 AM	46.2	46.5	48.8	51.2	64.5	1.4
5/30/2021	6:00 AM	46.6	47.1	49.4	51.8	65.6	1.1
5/30/2021	7:00 AM	47.4	44.6	47.6	51.0	78.5	1.7
5/30/2021	8:00 AM	42.9	42.3	45.8	50.0	64.4	1.1
5/30/2021	9:00 AM	44.3	43.3	48.0	52.2	67.4	0.3
5/30/2021	10:00 AM	45.0	41.0	49.0	54.4	63.4	2.2
5/30/2021	11:00 AM	46.0	42.4	49.5	54.4	66.3	1.4
5/30/2021	12:00 PM	44.3	42.0	47.7	53.1	63.0	1.4
5/30/2021	1:00 PM	45.2	43.7	48.8	53.4	63.6	2.5
5/30/2021	2:00 PM	55.4	44.3	53.0	62.9	82.4	2.5
5/30/2021	3:00 PM	47.2	47.1	50.8	53.9	63.0	2.5
5/30/2021	4:00 PM	47.4	46.4	50.8	54.9	72.8	3.4

5/30/2021	5:00 PM	46.6	44.3	51.3	54.9	63.7	3.7
5/30/2021	6:00 PM	46.0	43.4	51.1	54.5	63.8	6.1
5/30/2021	7:00 PM	47.3	45.3	51.5	56.1	69.9	9.2
5/30/2021	8:00 PM	47.5	47.1	51.6	54.6	72.1	10.6
5/30/2021	9:00 PM	51.7	46.1	48.5	55.7	77.2	11.2
5/30/2021	10:00 PM	45.7	46.2	47.1	47.9	70.2	9.5
5/30/2021	11:00 PM	41.5	43.0	44.3	45.4	51.9	8.9
5/31/2021	12:00 AM	42.1	43.1	45.8	47.1	50.2	7.8
5/31/2021	1:00 AM	42.0	42.7	43.5	44.1	49.2	6.9
5/31/2021	2:00 AM	50.5	41.0	42.4	54.9	75.3	7.8
5/31/2021	3:00 AM	38.0	38.9	39.7	40.5	49.8	8.3
5/31/2021	4:00 AM	47.4	45.7	51.9	56.1	64.3	4.3
5/31/2021	5:00 AM	46.9	47.2	49.3	52.0	71.6	3.7
5/31/2021	6:00 AM	46.3	47.1	49.3	51.3	63.7	3.5
5/31/2021	7:00 AM	45.6	45.2	47.7	51.9	65.4	0.0
5/31/2021	8:00 AM	43.4	44.0	46.5	48.9	60.7	0.3
5/31/2021	9:00 AM	47.9	44.7	46.5	49.1	76.3	0.8
5/31/2021	10:00 AM	46.4	45.6	48.3	53.2	64.1	1.7
5/31/2021	11:00 AM	44.7	45.0	46.7	48.6	59.3	0.8
5/31/2021	12:00 PM	43.5	43.2	46.0	49.8	59.0	0.6
5/31/2021	1:00 PM	42.0	42.0	44.0	46.8	61.5	0.3
5/31/2021	2:00 PM	40.5	40.6	42.1	44.6	58.6	0.6
5/31/2021	3:00 PM	42.5	41.3	43.2	46.8	70.1	3.1
5/31/2021	4:00 PM	42.1	41.6	43.9	46.7	65.7	4.3
5/31/2021	5:00 PM	41.7	41.7	43.5	46.0	62.3	6.4
5/31/2021	6:00 PM	48.8	43.5	45.2	48.7	75.6	7.8
5/31/2021	7:00 PM	42.8	43.2	44.6	46.4	57.7	9.2
5/31/2021	8:00 PM	43.7	44.1	46.1	48.3	59.0	9.5
5/31/2021	9:00 PM	48.7	43.9	46.1	49.9	76.7	10.3
5/31/2021	10:00 PM	42.5	43.3	45.4	47.1	52.9	9.5
5/31/2021	11:00 PM	41.8	42.4	44.0	45.6	56.3	9.5
6/1/2021	12:00 AM	43.9	44.9	46.4	47.8	56.2	9.5
6/1/2021	1:00 AM	46.0	46.6	47.9	49.3	59.9	12.1
6/1/2021	2:00 AM	50.0	44.8	46.5	54.9	74.7	8.1
6/1/2021	3:00 AM	40.8	42.0	43.2	44.6	56.3	5.3
6/1/2021	4:00 AM	46.7	46.2	50.6	53.9	65.0	8.1
6/1/2021	5:00 AM	44.2	44.7	46.6	48.2	59.6	5.5
6/1/2021	6:00 AM	46.3	47.2	48.9	50.2	59.5	4.0
6/1/2021	7:00 AM	44.5	45.0	46.1	47.5	62.5	2.2
6/1/2021	8:00 AM	43.3	43.8	44.6	45.8	59.2	0.8
6/1/2021	9:00 AM	43.0	43.5	44.5	45.5	60.9	0.6
6/1/2021	10:00 AM	44.9	43.9	46.4	51.6	62.9	0.8
6/1/2021	11:00 AM	43.3	43.9	45.1	46.8	56.6	1.4
6/1/2021	12:00 PM	41.6	42.0	43.0	44.5	52.6	2.0
6/1/2021	1:00 PM	42.2	42.2	43.9	46.3	61.3	1.4
6/1/2021	2:00 PM	42.1	42.1	44.2	47.8	58.3	2.0
6/1/2021	3:00 PM	42.7	42.1	43.9	46.7	60.9	7.2
6/1/2021	4:00 PM	41.4	41.1	42.6	46.0	56.6	7.2
6/1/2021	5:00 PM	41.7	41.9	43.5	45.9	58.1	7.8
6/1/2021	6:00 PM	41.8	41.7	43.5	45.7	62.5	9.2
6/1/2021	7:00 PM	42.7	43.1	44.7	46.2	61.5	8.6
6/1/2021	8:00 PM	46.7	47.0	48.5	50.3	63.4	10.6
6/1/2021	9:00 PM	48.4	48.8	50.7	52.5	65.1	11.4
6/1/2021	10:00 PM	53.9	47.3	50.3	57.4	77.8	10.6
6/1/2021	11:00 PM	44.8	45.3	46.4	48.6	60.3	11.1
6/2/2021	12:00 AM	45.8	46.3	48.3	50.4	60.2	10.6
6/2/2021	1:00 AM	44.7	45.4	46.9	48.2	55.1	9.2
6/2/2021	2:00 AM	49.2	44.2	46.7	51.8	73.0	6.4
6/2/2021	3:00 AM	44.5	45.3	47.2	49.1	62.2	5.8
6/2/2021	4:00 AM	49.2	49.4	52.6	55.3	64.7	4.6
6/2/2021	5:00 AM	50.2	51.0	52.7	54.1	59.6	2.9
6/2/2021	6:00 AM	50.3	51.1	52.6	54.3	62.5	2.2
6/2/2021	7:00 AM	46.6	47.2	49.2	51.2	64.3	2.0
6/2/2021	8:00 AM	46.2	46.9	48.4	50.1	60.1	1.4
6/2/2021	9:00 AM	47.3	47.2	49.6	52.0	64.6	0.6
6/2/2021	10:00 AM	51.0	51.7	52.8	54.2	66.1	3.7
6/2/2021	11:00 AM	51.4	50.7	52.4	57.3	70.3	4.4

6/2/2021	12:00 PM	50.3	49.5	51.1	53.5	74.7	4.4
6/2/2021	1:00 PM	51.5	49.8	51.6	56.1	72.0	3.1
6/2/2021	2:00 PM	51.1	49.4	51.1	56.2	74.6	3.4
6/2/2021	3:00 PM	51.3	51.7	53.0	54.3	68.4	5.5
6/2/2021	4:00 PM	52.0	51.9	53.2	55.9	73.1	6.1
6/2/2021	5:00 PM	50.4	50.8	52.3	54.3	61.8	6.7
6/2/2021	6:00 PM	50.3	50.9	52.0	53.2	59.0	8.9
6/2/2021	7:00 PM	51.0	51.1	52.5	54.2	68.7	9.2
6/2/2021	8:00 PM	61.7	51.3	54.4	63.8	88.9	9.2
6/2/2021	9:00 PM	47.6	48.1	49.4	50.6	56.7	8.1
6/2/2021	10:00 PM	46.9	47.5	48.4	49.1	60.6	9.2
6/2/2021	11:00 PM	45.3	46.0	47.1	48.2	60.8	10.3
6/3/2021	12:00 AM	43.2	43.8	45.4	46.8	55.4	8.3
6/3/2021	1:00 AM	43.6	44.1	45.1	46.8	55.3	7.2
6/3/2021	2:00 AM	48.4	44.1	46.1	56.4	76.8	6.9
6/3/2021	3:00 AM	42.8	42.8	44.9	47.5	59.8	6.1
6/3/2021	4:00 AM	47.3	47.6	50.3	53.4	66.4	6.1
6/3/2021	5:00 AM	48.9	49.8	51.4	52.8	62.6	7.8
6/3/2021	6:00 AM	47.4	48.3	49.6	50.7	60.9	7.8
6/3/2021	7:00 AM	48.0	49.0	50.2	51.4	58.8	7.5
6/3/2021	8:00 AM	47.9	48.4	49.9	51.8	60.4	6.7
6/3/2021	9:00 AM	48.4	48.6	50.3	53.1	65.6	5.8
6/3/2021	10:00 AM	49.1	49.6	50.6	52.2	63.9	5.8
6/3/2021	11:00 AM	49.2	49.8	51.5	53.7	65.2	7.5
6/3/2021	12:00 PM	50.2	51.1	52.7	54.2	64.6	7.2
6/3/2021	1:00 PM	50.3	50.3	52.0	54.5	69.0	6.9
6/3/2021	2:00 PM	61.5	51.3	52.5	55.9	90.2	6.4
6/3/2021	3:00 PM	50.9	51.5	52.6	53.8	60.6	7.2
6/3/2021	4:00 PM	48.9	49.6	50.8	51.6	57.4	6.1
6/3/2021	5:00 PM	51.2	51.7	52.8	54.1	64.3	6.9
6/3/2021	6:00 PM	50.4	50.9	52.1	53.3	60.6	7.2
6/3/2021	7:00 PM	49.7	50.1	51.1	52.5	61.8	8.1
6/3/2021	8:00 PM	51.7	52.7	54.1	55.3	63.5	9.7
6/3/2021	9:00 PM	52.7	52.2	53.8	56.0	77.1	7.8
6/3/2021	10:00 PM	50.0	50.6	52.1	53.7	67.1	6.1
6/3/2021	11:00 PM	48.0	48.8	50.5	52.2	62.7	6.9
6/4/2021	12:00 AM	43.8	44.6	46.0	46.9	52.3	8.6
6/4/2021	1:00 AM	43.4	44.2	45.5	46.7	53.0	9.5
6/4/2021	2:00 AM	49.2	44.4	46.8	57.4	74.9	6.7
6/4/2021	3:00 AM	45.9	46.4	48.3	50.2	63.8	6.7
6/4/2021	4:00 AM	46.7	47.2	49.7	52.4	60.3	7.5
6/4/2021	5:00 AM	50.8	51.6	53.4	55.2	63.0	8.3
6/4/2021	6:00 AM	50.6	51.6	53.2	54.5	60.3	8.7
6/4/2021	7:00 AM	50.7	50.9	52.3	53.5	76.7	5.8
6/4/2021	8:00 AM	50.0	50.5	52.0	53.7	63.1	7.2
6/4/2021	9:00 AM	48.8	49.3	50.7	52.3	63.2	10.0
6/4/2021	10:00 AM	49.3	49.7	51.3	53.0	65.2	8.6
6/4/2021	11:00 AM	48.8	49.3	51.2	53.3	62.8	10.3
6/4/2021	12:00 PM	62.3	48.8	52.0	67.3	91.5	7.5
6/18/2021	10:21 AM	48.2	48.4	49.5	51.2	75.2	5.3
6/18/2021	11:00 AM	48.2	48.3	49.9	53.2	63.5	5.3
6/18/2021	12:00 PM	48.5	49.1	50.5	51.9	61.5	4.7
6/18/2021	1:00 PM	49.7	50.2	51.2	52.4	64.5	5.3
6/18/2021	2:00 PM	49.1	49.3	50.5	52.1	65.8	5.8
6/18/2021	3:00 PM	49.0	49.1	50.4	52.7	66.9	7.5
6/18/2021	4:00 PM	47.6	47.9	49.1	50.3	74.7	7.2
6/18/2021	5:00 PM	47.9	47.9	49.4	52.7	65.6	6.1
6/18/2021	6:00 PM	47.4	48.0	49.4	50.7	60.8	5.8
6/18/2021	7:00 PM	52.3	50.0	51.5	55.0	78.0	8.1
6/18/2021	8:00 PM	48.9	49.3	50.4	51.6	66.4	7.8
6/18/2021	9:00 PM	49.7	49.1	50.4	52.6	71.3	6.9
6/18/2021	10:00 PM	48.1	48.8	49.9	50.8	57.1	9.2
6/18/2021	11:00 PM	45.2	45.6	47.5	49.1	66.6	9.5
6/19/2021	12:00 AM	50.7	44.1	45.8	58.4	75.1	9.2
6/19/2021	1:00 AM	42.1	41.9	43.5	45.2	68.5	10.0
6/19/2021	2:00 AM	40.0	40.5	43.0	45.5	54.1	7.5
6/19/2021	3:00 AM	41.1	41.6	44.8	47.3	58.4	4.0

6/19/2021	4:00 AM	46.2	46.3	49.3	54.2	59.3	3.8
6/19/2021	5:00 AM	45.4	46.0	48.2	50.2	63.4	5.2
6/19/2021	6:00 AM	44.8	45.3	47.2	49.0	66.6	4.3
6/19/2021	7:00 AM	45.0	45.7	47.4	49.0	59.0	5.0
6/19/2021	8:00 AM	47.6	47.1	49.1	52.1	69.0	4.4
6/19/2021	9:00 AM	47.4	48.2	49.3	50.3	63.7	4.0
6/19/2021	10:00 AM	48.8	49.4	50.8	52.3	60.3	4.4
6/19/2021	11:00 AM	47.2	47.8	49.3	51.3	65.5	5.3
6/19/2021	12:00 PM	46.2	46.2	47.7	49.8	63.3	5.3
6/19/2021	1:00 PM	45.8	46.4	47.6	48.7	59.2	5.8
6/19/2021	2:00 PM	49.2	47.5	49.0	52.5	74.5	5.8
6/19/2021	3:00 PM	50.1	49.8	51.1	53.7	75.5	8.3
6/19/2021	4:00 PM	49.3	49.8	51.0	52.5	61.5	9.2
6/19/2021	5:00 PM	49.2	50.1	51.3	52.5	61.6	6.7
6/19/2021	6:00 PM	48.3	49.0	50.3	51.5	60.1	7.5
6/19/2021	7:00 PM	46.9	47.8	49.8	51.8	67.8	4.4
6/19/2021	8:00 PM	46.3	45.8	47.4	50.6	63.0	4.6
6/19/2021	9:00 PM	51.0	47.9	49.3	54.9	75.8	7.5
6/19/2021	10:00 PM	46.2	47.0	48.1	49.4	57.8	8.9
6/19/2021	11:00 PM	45.6	46.1	46.9	47.7	57.0	9.2
6/20/2021	12:00 AM	46.9	47.5	48.7	49.9	57.4	7.8
6/20/2021	1:00 AM	45.2	45.8	47.2	48.7	57.8	6.7
6/20/2021	2:00 AM	43.9	44.2	45.6	47.1	66.1	6.4
6/20/2021	3:00 AM	48.9	43.5	44.9	47.0	75.3	5.0
6/20/2021	4:00 AM	48.0	45.9	50.5	57.6	64.3	3.4
6/20/2021	5:00 AM	45.3	45.8	47.0	48.4	62.0	1.1
6/20/2021	6:00 AM	43.4	43.7	44.8	46.0	64.0	2.0
6/20/2021	7:00 AM	49.3	42.7	44.8	55.6	77.7	0.3
6/20/2021	8:00 AM	41.6	41.6	42.6	43.9	62.0	1.1
6/20/2021	9:00 AM	44.0	42.6	44.7	49.5	64.5	2.0
6/20/2021	10:00 AM	40.9	41.1	42.4	44.2	60.4	2.0
6/20/2021	11:00 AM	45.6	43.1	47.0	53.2	66.5	1.4
6/20/2021	12:00 PM	44.7	42.6	44.5	51.4	64.0	0.0
6/20/2021	1:00 PM	45.0	43.6	45.7	49.4	65.9	1.1
6/20/2021	2:00 PM	44.8	45.0	46.5	49.5	55.6	3.4
6/20/2021	3:00 PM	44.6	44.7	46.9	49.5	57.0	5.0
6/20/2021	4:00 PM	43.8	44.0	45.7	48.0	56.5	6.9
6/20/2021	5:00 PM	44.8	44.5	46.5	49.6	62.4	10.6
6/20/2021	6:00 PM	43.7	43.4	44.8	47.6	62.1	12.4
6/20/2021	7:00 PM	42.9	43.3	44.4	45.8	54.6	11.4
6/20/2021	8:00 PM	43.9	44.4	45.6	47.0	54.8	11.7
6/20/2021	9:00 PM	43.3	43.9	45.0	46.4	56.1	12.4
6/20/2021	10:00 PM	53.4	45.0	46.5	50.4	81.8	13.6
6/20/2021	11:00 PM	49.9	44.7	46.9	49.5	78.0	13.3
6/21/2021	12:00 AM	42.0	42.5	44.1	45.9	57.2	13.6
6/21/2021	1:00 AM	41.8	42.4	45.3	47.7	52.8	13.9
6/21/2021	2:00 AM	49.8	44.0	45.6	51.4	73.6	12.4
6/21/2021	3:00 AM	41.7	42.3	44.0	45.6	52.1	9.7
6/21/2021	4:00 AM	49.3	48.1	51.1	57.8	63.6	9.5
6/21/2021	5:00 AM	46.8	47.5	48.5	49.4	58.3	6.9
6/21/2021	6:00 AM	45.4	46.4	47.7	48.7	54.7	2.2
6/21/2021	7:00 AM	42.8	43.2	44.5	46.1	61.5	1.7
6/21/2021	8:00 AM	47.7	44.0	46.4	55.7	67.3	0.8
6/21/2021	9:00 AM	45.2	44.6	46.0	48.5	68.5	0.6
6/21/2021	10:00 AM	45.7	45.3	47.0	50.5	62.6	0.3
6/21/2021	11:00 AM	45.4	45.4	47.2	49.8	63.0	1.1
6/21/2021	11:41 AM	46.0	44.3	45.6	46.8	79.3	1.1
6/21/2021	12:00 PM	43.0	43.2	44.5	46.7	54.9	1.1
6/21/2021	1:00 PM	45.5	45.2	47.2	49.4	63.9	1.4
6/21/2021	2:00 PM	47.9	47.4	50.4	55.2	63.5	2.0
6/21/2021	3:00 PM	46.9	45.5	48.8	54.1	66.6	8.9
6/21/2021	4:00 PM	43.8	43.9	45.3	47.9	57.4	10.0
6/21/2021	5:00 PM	51.7	44.9	47.6	53.6	77.7	12.1
6/21/2021	6:00 PM	52.4	43.1	44.4	46.4	94.1	12.1
6/21/2021	7:00 PM	49.2	50.1	52.2	53.9	66.9	12.8
6/21/2021	8:00 PM	52.1	45.3	47.6	53.0	76.0	13.6
6/21/2021	9:00 PM	46.5	46.1	48.3	53.3	63.5	12.7

6/21/2021	10:00 PM	45.2	45.8	46.6	47.6	56.8	11.7
6/21/2021	11:00 PM	44.5	44.9	45.8	46.8	68.3	11.7
6/22/2021	12:00 AM	43.6	44.0	46.4	47.9	54.1	11.1
6/22/2021	1:00 AM	48.7	46.4	48.4	52.7	69.3	10.6
6/22/2021	2:00 AM	43.5	44.2	46.1	47.9	53.2	10.1
6/22/2021	3:00 AM	42.8	43.7	45.4	46.7	59.3	5.3
6/22/2021	4:00 AM	48.4	48.7	50.7	54.2	61.2	3.2
6/22/2021	5:00 AM	48.8	49.6	50.9	52.1	60.2	3.1
6/22/2021	6:00 AM	50.2	50.8	51.9	53.2	63.2	3.1
6/22/2021	7:00 AM	46.6	47.6	48.7	49.7	62.2	2.5
6/22/2021	8:00 AM	46.1	46.4	48.2	50.3	60.5	2.2
6/22/2021	9:00 AM	48.6	48.6	50.3	53.7	66.1	3.1
6/22/2021	10:00 AM	53.8	48.8	51.5	60.0	75.1	2.0
6/22/2021	11:00 AM	53.9	47.4	51.2	59.6	79.0	2.8
6/22/2021	12:00 PM	48.5	47.7	49.6	53.9	67.6	2.2
6/22/2021	1:00 PM	48.0	47.5	49.3	52.5	67.1	0.0
6/22/2021	2:00 PM	49.2	49.4	50.6	52.6	63.2	0.3
6/22/2021	3:00 PM	48.2	48.7	49.8	51.2	61.9	3.2
6/22/2021	4:00 PM	48.6	49.1	50.5	51.9	63.8	8.9
6/22/2021	5:00 PM	49.2	49.8	51.2	52.2	59.7	7.5
6/22/2021	6:00 PM	49.1	49.7	50.9	52.0	60.0	5.8
6/22/2021	7:00 PM	51.4	49.7	50.8	52.0	86.2	5.8
6/22/2021	8:00 PM	51.1	50.7	51.8	54.6	71.6	7.8
6/22/2021	9:00 PM	53.8	49.4	50.8	59.6	81.9	6.9
6/22/2021	10:00 PM	51.8	50.5	53.6	58.8	75.9	6.1
6/22/2021	11:00 PM	46.4	47.3	49.0	50.2	54.6	6.9
6/23/2021	12:00 AM	44.5	45.1	46.2	47.1	51.6	7.2
6/23/2021	1:00 AM	42.7	43.2	44.2	45.4	53.2	6.1
6/23/2021	2:00 AM	48.3	42.3	44.0	47.8	71.0	6.7
6/23/2021	3:00 AM	39.7	40.3	41.7	43.3	58.5	9.2
6/23/2021	4:00 AM	43.0	43.8	45.8	47.4	58.1	8.3
6/23/2021	5:00 AM	53.3	44.9	46.8	48.9	85.1	6.4
6/23/2021	6:00 AM	46.6	47.4	49.0	50.2	58.0	4.3
6/23/2021	7:00 AM	44.0	44.5	46.2	47.7	66.9	2.8
6/23/2021	8:00 AM	44.5	44.8	46.3	47.7	61.9	3.1
6/23/2021	9:00 AM	46.5	45.6	47.2	52.2	65.6	5.3
6/23/2021	10:00 AM	45.3	44.8	46.4	51.1	62.4	7.2
6/23/2021	11:00 AM	45.3	45.0	46.1	47.7	63.4	6.1
6/23/2021	12:00 PM	49.9	46.4	48.4	53.9	74.7	4.3
6/23/2021	1:00 PM	45.1	45.7	47.0	48.2	65.3	3.7
6/23/2021	2:00 PM	51.6	46.0	48.8	57.0	78.6	2.5
6/23/2021	3:00 PM	42.8	43.0	44.6	47.1	58.6	3.4
6/23/2021	4:00 PM	46.1	45.8	47.6	51.6	64.6	5.3
6/23/2021	5:00 PM	47.7	48.3	49.5	50.7	62.3	3.4
6/23/2021	6:00 PM	46.8	47.4	48.3	49.2	57.7	4.0
6/23/2021	7:00 PM	47.9	48.4	49.6	51.0	60.0	6.4
6/23/2021	8:00 PM	48.8	49.4	50.7	51.9	61.8	5.8
6/23/2021	9:00 PM	51.3	48.6	50.0	54.5	76.8	4.4
6/23/2021	10:00 PM	46.5	47.1	47.9	48.6	52.8	8.9
6/23/2021	11:00 PM	47.7	48.3	49.2	50.0	52.8	8.9
6/24/2021	12:00 AM	47.2	47.8	48.6	49.4	53.4	6.9
6/24/2021	1:00 AM	46.2	47.3	48.5	49.3	51.8	5.5
6/24/2021	2:00 AM	48.2	41.5	42.8	46.2	72.7	6.7
6/24/2021	3:00 AM	42.9	43.5	44.7	45.7	58.3	4.4
6/24/2021	4:00 AM	44.9	45.5	46.8	48.1	56.7	3.1
6/24/2021	5:00 AM	45.0	45.7	47.0	48.2	53.6	2.5
6/24/2021	6:00 AM	47.3	48.0	49.6	51.5	60.3	2.5
6/24/2021	7:00 AM	47.9	48.7	49.8	50.7	56.6	3.4
6/24/2021	8:00 AM	46.7	47.3	48.5	49.7	60.2	4.4
6/24/2021	9:00 AM	45.4	45.0	46.7	50.7	61.8	4.6
6/24/2021	10:00 AM	55.8	44.8	46.7	57.1	81.2	3.1
6/24/2021	11:00 AM	58.9	45.5	56.1	67.5	82.2	2.0
6/24/2021	12:00 PM	52.4	42.3	47.0	58.5	78.6	3.1
6/24/2021	1:00 PM	49.2	42.8	46.0	56.6	74.1	3.5
6/24/2021	2:00 PM	58.9	44.2	55.5	67.6	80.4	3.4
6/24/2021	3:00 PM	53.2	45.4	49.8	60.4	78.2	2.5
6/24/2021	4:00 PM	48.5	46.4	49.2	56.5	67.4	3.7

6/24/2021	5:00 PM	44.6	44.9	46.4	48.2	59.3	3.1
6/24/2021	6:00 PM	45.4	45.2	46.9	50.7	62.6	4.6
6/24/2021	7:00 PM	48.1	48.4	49.5	51.0	63.5	6.7
6/24/2021	8:00 PM	49.0	49.6	50.8	51.9	60.5	9.5
6/24/2021	9:00 PM	47.1	47.8	49.4	51.0	62.2	11.1
6/24/2021	10:00 PM	44.9	45.4	46.5	47.6	57.7	11.5
6/24/2021	11:00 PM	49.5	45.4	47.3	49.9	76.6	8.6
6/25/2021	12:00 AM	45.0	45.8	47.1	48.3	55.5	6.7
6/25/2021	1:00 AM	43.5	44.4	46.0	47.4	52.7	6.4
6/25/2021	2:00 AM	41.9	42.7	44.3	45.8	52.8	4.9
6/25/2021	3:00 AM	42.4	43.7	45.1	46.2	54.6	2.2
6/25/2021	4:00 AM	49.7	44.8	50.3	57.2	69.3	1.1
6/25/2021	5:00 AM	42.8	42.9	44.3	46.4	58.2	0.8
6/25/2021	6:00 AM	43.3	43.7	44.8	46.1	63.2	0.6
6/25/2021	7:00 AM	43.1	43.3	44.6	46.2	58.9	1.1
6/25/2021	8:00 AM	44.4	44.3	45.3	47.2	61.7	1.1
6/25/2021	9:00 AM	57.8	46.7	57.6	65.9	84.0	0.8
6/25/2021	10:00 AM	52.5	45.1	49.4	60.7	79.5	2.2
6/25/2021	11:00 AM	62.1	46.1	53.4	64.2	90.4	0.6
7/2/2021	10:00 AM	42.5	43.4	44.8	45.7	64.9	3.1
7/2/2021	11:00 AM	44.0	43.8	45.2	48.3	71.8	2.8
7/2/2021	12:00 PM	46.5	44.4	46.6	52.7	68.4	4.4
7/2/2021	1:00 PM	47.0	43.5	44.9	46.5	77.3	1.1
7/2/2021	2:00 PM	43.4	42.8	45.0	48.4	65.7	2.0
7/2/2021	3:00 PM	44.0	44.4	45.4	47.2	60.6	0.0
7/2/2021	4:00 PM	44.8	44.2	45.4	47.6	67.1	0.6
7/2/2021	5:00 PM	45.7	46.2	47.5	49.2	62.0	4.0
7/2/2021	6:00 PM	47.1	47.7	48.5	49.3	58.8	7.8
7/2/2021	7:00 PM	52.0	48.8	50.4	53.4	78.3	7.2
7/2/2021	8:00 PM	48.6	49.1	50.4	51.7	58.4	7.5
7/2/2021	9:00 PM	50.0	49.6	51.3	53.4	85.1	6.7
7/2/2021	10:00 PM	48.5	45.9	47.2	49.4	83.6	8.3
7/2/2021	11:00 PM	45.2	45.7	46.8	48.3	66.8	8.1
7/3/2021	12:00 AM	49.4	46.4	48.4	51.8	71.5	4.9
7/3/2021	1:00 AM	45.3	44.3	45.1	46.0	81.8	7.2
7/3/2021	2:00 AM	42.8	43.1	43.9	45.3	53.2	3.7
7/3/2021	3:00 AM	43.4	44.0	44.6	45.2	48.7	3.7
7/3/2021	4:00 AM	50.4	46.0	50.4	59.3	70.8	1.7
7/3/2021	5:00 AM	46.2	46.7	48.3	49.9	56.2	0.6
7/3/2021	6:00 AM	52.3	47.7	55.8	62.3	71.3	2.8
7/3/2021	7:00 AM	42.8	43.6	44.6	45.4	56.4	1.7
7/3/2021	8:00 AM	41.3	42.0	43.4	44.5	63.4	3.4
7/3/2021	9:00 AM	40.7	40.9	41.9	43.2	57.1	2.2
7/3/2021	10:00 AM	42.2	41.0	42.8	49.1	62.8	0.0
7/3/2021	11:00 AM	44.3	42.1	44.2	48.7	65.6	1.1
7/3/2021	12:00 PM	43.0	41.9	43.9	49.5	60.2	1.1
7/3/2021	1:00 PM	42.0	42.5	43.9	45.8	54.6	1.1
7/3/2021	2:00 PM	41.5	42.1	43.5	45.5	58.3	2.8
7/3/2021	3:00 PM	44.6	44.2	46.4	49.3	64.9	2.5
7/3/2021	4:00 PM	44.0	44.8	46.4	48.0	58.5	4.9
7/3/2021	5:00 PM	45.3	45.9	47.5	49.1	61.5	9.2
7/3/2021	6:00 PM	47.0	47.4	48.7	50.1	62.7	12.1
7/3/2021	7:00 PM	48.3	48.7	49.8	51.1	66.6	11.5
7/3/2021	8:00 PM	49.9	50.4	51.7	53.5	64.9	12.1
7/3/2021	9:00 PM	53.8	50.9	53.0	57.9	88.1	10.0
7/3/2021	10:00 PM	52.3	49.5	52.0	55.8	80.1	9.2
7/3/2021	11:00 PM	47.8	48.2	49.1	50.0	59.6	8.9
7/4/2021	12:00 AM	49.7	47.9	48.8	49.8	82.4	9.2
7/4/2021	1:00 AM	48.4	46.6	47.4	48.0	87.6	8.3
7/4/2021	2:00 AM	50.8	44.5	45.9	53.5	79.4	6.4
7/4/2021	3:00 AM	41.8	43.1	44.4	45.3	52.0	3.5
7/4/2021	4:00 AM	43.7	43.0	46.1	52.0	58.5	2.0
7/4/2021	5:00 AM	40.7	41.0	42.5	44.3	55.0	3.1
7/4/2021	6:00 AM	39.6	40.0	41.7	43.5	53.4	3.4
7/4/2021	7:00 AM	42.6	43.2	45.4	48.4	57.8	3.4
7/4/2021	8:00 AM	42.2	42.8	44.8	46.4	66.6	3.4
7/4/2021	9:00 AM	44.9	45.7	47.4	49.0	55.7	3.7

7/4/2021	10:00 AM	47.5	45.3	47.0	49.9	70.2	3.4
7/4/2021	11:00 AM	44.4	43.4	45.5	49.8	64.0	2.3
7/4/2021	12:00 PM	42.5	43.0	44.3	45.7	56.9	2.5
7/4/2021	1:00 PM	40.5	40.5	41.6	42.8	70.1	2.6
7/4/2021	2:00 PM	40.6	41.1	42.7	44.9	57.0	5.5
7/4/2021	3:00 PM	41.5	41.4	43.1	45.8	59.5	6.1
7/4/2021	4:00 PM	44.2	44.2	46.4	49.8	66.9	5.8
7/4/2021	5:00 PM	46.5	47.3	48.5	49.6	54.9	6.9
7/4/2021	6:00 PM	48.9	48.5	49.9	52.3	72.7	6.4
7/4/2021	7:00 PM	58.7	48.7	50.2	54.0	100.1	5.5
7/4/2021	8:00 PM	62.2	50.6	52.3	58.3	97.7	7.5
7/4/2021	9:00 PM	66.0	53.9	62.1	70.8	101.9	8.1
7/4/2021	10:00 PM	71.7	63.4	72.6	80.4	98.9	7.5
7/4/2021	11:00 PM	64.9	52.2	55.2	63.2	96.0	7.8
7/5/2021	12:00 AM	52.8	45.3	46.3	49.5	89.3	6.9
7/5/2021	1:00 AM	42.6	43.3	44.4	45.3	60.7	11.0
7/5/2021	2:00 AM	49.7	41.3	42.9	50.6	73.6	9.2
7/5/2021	3:00 AM	44.0	41.6	43.9	46.7	72.2	6.3
7/5/2021	4:00 AM	45.3	42.4	45.2	55.2	61.3	5.8
7/5/2021	5:00 AM	43.4	43.8	45.2	46.6	58.2	4.3
7/5/2021	6:00 AM	42.9	43.1	44.4	45.8	61.5	6.7
7/5/2021	7:00 AM	43.0	43.7	45.2	46.5	54.0	3.7
7/5/2021	8:00 AM	44.1	44.6	46.6	48.6	57.3	3.1
7/5/2021	9:00 AM	42.7	43.3	44.8	46.3	57.9	3.1
7/5/2021	10:00 AM	45.8	46.7	48.4	49.7	57.9	4.4
7/5/2021	11:00 AM	48.3	45.6	47.4	52.7	72.0	5.8
7/5/2021	12:00 PM	46.7	45.7	47.9	52.7	67.7	5.3
7/5/2021	1:00 PM	47.6	48.2	49.9	51.8	65.5	3.4
7/5/2021	2:00 PM	46.0	46.3	47.6	49.0	63.2	4.4
7/5/2021	3:00 PM	44.6	45.2	46.4	47.5	57.4	2.2
7/5/2021	4:00 PM	46.2	46.7	48.1	50.0	61.6	3.4
7/5/2021	5:00 PM	49.1	48.5	49.9	51.0	84.0	5.3
7/5/2021	6:00 PM	48.7	49.3	50.4	51.4	60.2	6.1
7/5/2021	7:00 PM	49.8	49.2	50.4	52.4	70.8	5.5
7/5/2021	8:00 PM	50.7	50.6	51.9	54.2	70.2	7.2
7/5/2021	9:00 PM	53.1	49.7	51.2	54.9	78.3	8.6
7/5/2021	10:00 PM	46.1	46.6	47.6	48.8	63.8	6.9
7/5/2021	11:00 PM	45.9	46.4	47.3	48.3	57.0	8.9
7/6/2021	12:00 AM	46.1	47.1	48.3	49.2	52.5	7.2
7/6/2021	1:00 AM	47.4	48.1	49.0	49.7	53.1	9.2
7/6/2021	2:00 AM	50.3	47.7	49.0	58.2	72.8	9.5
7/6/2021	3:00 AM	44.4	44.9	46.0	47.1	72.3	4.6
7/6/2021	4:00 AM	46.7	46.2	49.3	53.5	60.5	3.4
7/6/2021	5:00 AM	46.8	47.2	48.7	50.8	60.6	2.5
7/6/2021	6:00 AM	47.1	47.3	48.6	50.0	74.5	3.5
7/6/2021	7:00 AM	46.5	47.0	48.5	50.1	64.5	2.5
7/6/2021	8:00 AM	45.6	46.2	47.6	49.1	60.5	1.7
7/6/2021	9:00 AM	44.8	45.3	46.9	48.3	56.8	0.8
7/6/2021	10:00 AM	44.5	44.2	45.8	48.8	65.3	0.8
7/6/2021	11:00 AM	46.8	46.9	48.8	52.2	61.6	2.9
7/6/2021	12:00 PM	43.9	44.1	47.1	49.7	64.8	2.5
7/6/2021	1:00 PM	41.7	40.9	42.4	46.0	60.3	2.2
7/6/2021	2:00 PM	42.6	42.5	44.4	47.1	64.4	2.0
7/6/2021	3:00 PM	42.1	42.4	44.6	47.7	55.0	3.7
7/6/2021	4:00 PM	42.3	42.1	44.4	48.0	59.4	2.9
7/6/2021	5:00 PM	46.1	46.6	47.6	48.9	56.0	2.2
7/6/2021	6:00 PM	47.9	48.1	49.1	50.8	62.1	3.4
7/6/2021	7:00 PM	48.8	49.3	50.5	51.8	58.8	4.0
7/6/2021	8:00 PM	51.2	50.7	51.9	53.4	71.7	7.8
7/6/2021	9:00 PM	48.3	48.8	50.2	52.0	60.2	8.1
7/6/2021	10:00 PM	47.7	47.9	49.0	50.0	75.8	7.2
7/6/2021	11:00 PM	47.0	47.3	48.2	49.1	71.1	8.1
7/7/2021	12:00 AM	46.1	46.7	47.5	48.2	55.3	7.2
7/7/2021	1:00 AM	50.0	48.2	49.6	51.1	74.9	6.7
7/7/2021	2:00 AM	43.7	44.3	45.4	46.5	54.8	4.9
7/7/2021	3:00 AM	44.0	44.5	45.7	47.0	60.4	3.1
7/7/2021	4:00 AM	46.7	45.6	49.4	54.7	60.4	2.8

7/7/2021	5:00 AM	45.3	45.8	47.5	49.5	58.4	4.6
7/7/2021	6:00 AM	46.9	47.7	49.2	50.6	61.0	4.4
7/7/2021	7:00 AM	46.2	46.8	48.3	49.6	68.5	4.4
7/7/2021	8:00 AM	46.8	47.8	49.4	50.5	58.3	5.0
7/7/2021	9:00 AM	46.7	47.4	48.5	49.5	61.8	2.5
7/7/2021	10:00 AM	49.4	50.0	51.7	54.0	63.7	2.9
7/7/2021	11:00 AM	50.7	50.7	52.5	55.7	68.0	6.4
7/7/2021	12:00 PM	58.6	52.0	54.1	58.6	86.1	4.4
7/7/2021	1:00 PM	56.3	52.8	56.3	65.4	80.7	5.0
7/7/2021	2:00 PM	48.3	48.3	49.4	51.0	66.5	5.5
7/7/2021	3:00 PM	48.2	48.5	49.8	51.8	65.1	4.6
7/7/2021	4:00 PM	48.3	48.8	49.9	51.2	63.0	4.9
7/7/2021	5:00 PM	47.7	48.2	49.3	50.6	59.2	10.1
7/7/2021	6:00 PM	47.6	47.9	49.1	51.0	65.0	13.0
7/7/2021	7:00 PM	48.7	48.2	49.6	51.5	85.0	13.0
7/7/2021	8:00 PM	54.5	48.9	50.4	53.6	83.0	13.3
7/7/2021	9:00 PM	47.7	48.3	49.4	50.5	58.9	13.0
7/7/2021	10:00 PM	45.0	45.6	46.7	47.9	59.5	12.4
7/7/2021	11:00 PM	43.8	44.2	45.7	46.9	52.6	10.0
7/8/2021	12:00 AM	43.6	44.3	45.4	46.2	53.5	10.0
7/8/2021	1:00 AM	43.4	43.8	44.7	45.9	52.7	10.0
7/8/2021	2:00 AM	42.6	43.2	44.2	45.1	52.8	8.9
7/8/2021	3:00 AM	48.1	43.9	45.8	51.2	68.7	4.6
7/8/2021	4:00 AM	43.8	43.9	46.2	48.7	54.8	3.7
7/8/2021	5:00 AM	46.4	46.8	48.6	50.7	60.0	4.0
7/8/2021	6:00 AM	46.5	47.1	48.7	50.2	69.8	3.1
7/8/2021	7:00 AM	44.6	44.2	45.7	47.4	64.5	3.4
7/8/2021	8:00 AM	41.8	42.3	43.9	45.8	59.7	3.4
7/8/2021	9:00 AM	43.0	43.6	45.3	47.2	57.7	2.8
7/8/2021	10:00 AM	45.1	44.8	46.0	47.8	66.7	3.4
7/8/2021	11:00 AM	47.8	46.6	48.3	51.9	70.9	2.8
7/8/2021	12:00 PM	45.6	46.0	47.5	49.0	61.2	2.0
7/8/2021	1:00 PM	46.4	46.4	48.3	50.7	63.7	2.2
7/8/2021	2:00 PM	48.5	46.5	48.4	56.9	69.1	1.1
7/8/2021	3:00 PM	46.1	45.8	47.4	50.2	65.2	1.1
7/8/2021	4:00 PM	46.5	46.4	47.9	50.5	71.5	1.7
7/8/2021	5:00 PM	47.5	47.2	48.6	51.0	65.2	4.0
7/8/2021	6:00 PM	46.1	46.5	48.0	49.4	61.6	5.2
7/8/2021	7:00 PM	46.8	47.3	48.2	49.0	57.3	7.2
7/8/2021	8:00 PM	53.3	48.7	49.8	52.4	80.3	5.8
7/8/2021	9:00 PM	48.2	48.5	49.6	50.6	80.9	2.8
7/8/2021	10:00 PM	46.3	46.7	47.8	48.8	57.2	7.5
7/8/2021	11:00 PM	43.6	44.3	45.3	46.1	50.5	8.3
7/9/2021	12:00 AM	42.7	43.6	44.7	45.7	48.7	5.8
7/9/2021	1:00 AM	40.1	40.5	41.8	43.2	48.7	7.8
7/9/2021	2:00 AM	48.2	40.6	42.2	48.8	73.3	8.3
7/9/2021	3:00 AM	43.6	41.3	42.6	47.3	63.9	5.2
7/9/2021	4:00 AM	46.4	44.4	49.6	55.2	60.1	2.5
7/9/2021	5:00 AM	46.0	45.7	47.7	51.1	65.4	3.4
7/9/2021	6:00 AM	49.1	49.8	50.9	52.0	57.6	4.3
7/9/2021	7:00 AM	47.4	48.1	49.4	50.8	62.0	4.4
7/9/2021	8:00 AM	43.8	44.4	45.8	47.3	59.3	6.4
7/9/2021	9:00 AM	43.2	43.8	45.1	46.4	58.3	2.5
7/9/2021	10:00 AM	45.8	44.6	46.1	48.6	70.2	2.6
7/9/2021	11:00 AM	48.3	46.1	48.6	56.5	71.1	2.8
7/9/2021	12:00 PM	44.3	44.7	46.3	47.8	63.6	4.9
7/23/2021	10:00 AM	42.8	42.6	44.4	47.3	60.4	N/A
7/23/2021	11:00 AM	43.3	43.5	45.2	47.0	62.0	N/A
7/23/2021	12:00 PM	44.4	41.6	43.9	49.3	70.9	N/A
7/23/2021	1:00 PM	42.7	39.0	42.0	48.9	67.9	N/A
7/23/2021	2:00 PM	45.2	43.4	45.8	50.6	69.2	N/A
7/23/2021	3:00 PM	46.3	45.7	47.5	51.2	67.5	4.4
7/23/2021	4:00 PM	45.9	46.7	48.1	49.5	57.2	5.2
7/23/2021	5:00 PM	47.4	47.6	48.8	50.0	67.4	4.0
7/23/2021	6:00 PM	47.2	47.9	49.3	50.7	63.2	3.4
7/23/2021	7:00 PM	45.6	45.9	47.2	48.8	63.4	5.1
7/23/2021	8:00 PM	51.0	48.1	49.5	52.2	75.8	7.8

7/23/2021	9:00 PM	47.2	47.8	49.5	50.9	62.3	9.5
7/23/2021	10:00 PM	44.5	45.2	46.8	48.1	55.5	9.2
7/23/2021	11:00 PM	43.8	44.7	46.3	47.3	56.8	6.9
7/24/2021	12:00 AM	49.8	45.5	47.0	55.8	73.0	6.7
7/24/2021	1:00 AM	43.0	43.4	44.6	46.3	58.2	7.5
7/24/2021	2:00 AM	42.4	43.3	45.0	46.9	57.3	4.0
7/24/2021	3:00 AM	40.6	41.5	42.5	43.7	48.8	2.8
7/24/2021	4:00 AM	42.3	43.0	43.8	44.6	50.0	0.8
7/24/2021	5:00 AM	45.0	45.9	47.9	49.8	60.1	0.8
7/24/2021	6:00 AM	42.1	42.7	44.0	45.4	55.8	2.0
7/24/2021	7:00 AM	42.7	43.1	44.4	46.2	57.5	2.0
7/24/2021	8:00 AM	41.1	41.8	43.6	45.0	60.7	3.1
7/24/2021	9:00 AM	43.9	41.0	45.4	52.3	63.0	2.5
7/24/2021	10:00 AM	38.4	38.4	40.1	43.8	51.6	2.2
7/24/2021	11:00 AM	42.4	39.2	43.0	49.4	63.5	2.5
7/24/2021	12:00 PM	40.4	39.2	42.1	47.9	59.5	3.1
7/24/2021	1:00 PM	43.0	41.6	43.4	48.6	65.0	3.4
7/24/2021	2:00 PM	43.4	43.7	45.1	47.1	60.8	4.0
7/24/2021	3:00 PM	46.6	47.3	48.3	49.2	55.9	4.0
7/24/2021	4:00 PM	48.3	48.8	49.9	51.3	63.4	1.7
7/24/2021	5:00 PM	48.0	48.5	49.4	50.3	57.7	3.4
7/24/2021	6:00 PM	49.5	50.0	51.0	52.2	61.4	6.4
7/24/2021	7:00 PM	50.5	50.8	51.9	53.2	64.2	7.2
7/24/2021	8:00 PM	54.3	50.7	52.7	57.0	82.1	10.8
7/24/2021	9:00 PM	49.1	49.7	50.8	51.9	59.5	9.7
7/24/2021	10:00 PM	48.7	49.1	50.3	51.4	63.2	10.0
7/24/2021	11:00 PM	47.7	48.4	49.2	50.0	58.4	6.7
7/25/2021	12:00 AM	47.2	47.9	48.8	49.7	54.8	9.7
7/25/2021	1:00 AM	43.5	44.3	45.5	46.8	57.9	8.3
7/25/2021	2:00 AM	49.4	40.9	43.1	53.4	73.7	4.3
7/25/2021	3:00 AM	38.3	38.9	40.1	41.6	55.0	3.1
7/25/2021	4:00 AM	41.2	41.7	44.6	47.0	54.5	2.8
7/25/2021	5:00 AM	44.6	45.2	47.5	49.6	61.1	3.4
7/25/2021	6:00 AM	41.8	42.6	44.4	46.3	55.2	4.9
7/25/2021	7:00 AM	42.3	43.0	44.9	46.7	54.3	4.7
7/25/2021	8:00 AM	44.5	45.2	46.4	47.5	53.4	6.4
7/25/2021	9:00 AM	46.8	47.2	48.6	50.4	71.0	5.8
7/25/2021	10:00 AM	45.3	46.1	47.5	48.8	57.6	6.1
7/25/2021	11:00 AM	44.2	44.9	46.5	48.0	60.0	5.8
7/25/2021	12:00 PM	46.1	46.4	47.8	49.5	63.6	5.3
7/25/2021	1:00 PM	46.2	46.8	47.8	48.9	54.9	5.0
7/25/2021	2:00 PM	47.5	48.2	49.1	50.0	54.6	6.1
7/25/2021	3:00 PM	49.3	49.8	51.0	52.1	58.1	7.2
7/25/2021	4:00 PM	50.5	50.7	51.8	53.5	68.1	6.1
7/25/2021	5:00 PM	49.4	50.0	50.9	51.7	70.3	9.5
7/25/2021	6:00 PM	50.2	50.7	52.0	53.5	67.6	8.9
7/25/2021	7:00 PM	50.7	51.5	52.5	53.4	58.7	8.1
7/25/2021	8:00 PM	52.1	48.8	49.8	51.0	72.3	6.7
7/25/2021	9:00 PM	47.2	47.7	48.8	49.9	55.1	7.2
7/25/2021	10:00 PM	44.6	45.4	46.6	47.8	56.9	9.5
7/25/2021	11:00 PM	44.3	44.8	47.0	49.0	55.9	8.1
7/26/2021	12:00 AM	42.1	42.8	44.3	45.8	51.2	6.1
7/26/2021	1:00 AM	39.7	40.2	42.0	43.5	49.1	8.3
7/26/2021	2:00 AM	48.9	39.8	42.7	53.1	80.2	7.5
7/26/2021	3:00 AM	39.9	40.5	43.0	45.2	53.0	8.9
7/26/2021	4:00 AM	43.4	44.2	46.4	48.1	58.0	8.9
7/26/2021	5:00 AM	46.2	46.5	48.6	50.9	63.8	5.8
7/26/2021	6:00 AM	47.5	48.5	50.1	51.4	60.5	5.8
7/26/2021	7:00 AM	45.2	46.0	47.3	48.6	59.4	7.2
7/26/2021	8:00 AM	45.3	46.0	47.7	49.3	59.1	6.9
7/26/2021	9:00 AM	45.4	46.1	47.5	49.0	60.5	6.4
7/26/2021	10:00 AM	46.3	46.7	48.8	51.1	58.2	5.8
7/26/2021	11:00 AM	45.6	46.1	47.7	49.5	62.6	5.8
7/26/2021	12:22 PM	46.5	45.0	47.4	52.4	76.2	6.1
7/26/2021	1:00 PM	45.5	45.7	47.1	49.8	61.4	6.1
7/26/2021	2:00 PM	46.5	46.8	48.2	50.1	67.3	5.8
7/26/2021	3:00 PM	48.1	48.8	49.7	50.6	59.4	6.9

7/26/2021	4:00 PM	49.5	50.0	50.9	51.9	62.6	6.7
7/26/2021	5:00 PM	51.0	51.4	52.3	53.2	67.4	6.1
7/26/2021	6:00 PM	50.1	50.7	51.7	52.4	59.3	5.5
7/26/2021	7:00 PM	49.3	50.0	51.1	52.3	63.7	4.7
7/26/2021	8:00 PM	55.4	48.8	50.1	61.6	80.7	6.1
7/26/2021	9:00 PM	48.5	49.1	49.8	50.5	53.9	5.5
7/26/2021	10:00 PM	46.7	47.3	48.2	49.1	56.1	6.9
7/26/2021	11:00 PM	47.0	47.0	48.4	50.5	67.8	7.5
7/27/2021	12:00 AM	45.0	45.7	46.6	47.3	51.8	8.9
7/27/2021	1:00 AM	43.2	43.9	45.1	46.2	55.4	4.9
7/27/2021	2:00 AM	48.3	41.2	43.3	53.9	73.1	4.6
7/27/2021	3:00 AM	39.3	39.9	41.9	44.0	50.2	6.9
7/27/2021	4:00 AM	40.5	41.3	43.4	44.9	50.1	4.4
7/27/2021	5:00 AM	42.6	43.6	45.2	46.6	54.1	5.5
7/27/2021	6:00 AM	46.2	47.0	48.8	50.2	62.0	4.9
7/27/2021	7:00 AM	44.0	44.8	46.3	47.8	60.0	5.0
7/27/2021	8:00 AM	45.8	46.5	47.8	49.4	58.2	4.9
7/27/2021	9:00 AM	45.9	46.3	48.0	49.9	60.2	5.3
7/27/2021	10:00 AM	41.9	41.6	43.6	46.5	60.1	6.4
7/27/2021	11:00 AM	40.6	40.8	41.9	44.2	52.1	4.7
7/27/2021	12:00 PM	39.9	39.7	41.2	45.3	56.6	3.7
7/27/2021	1:00 PM	42.4	41.0	42.6	46.0	66.1	3.1
7/27/2021	2:00 PM	41.3	42.0	44.4	46.4	55.3	3.1
7/27/2021	3:00 PM	44.9	45.3	46.9	48.6	61.8	1.7
7/27/2021	4:00 PM	47.1	47.8	49.1	50.4	58.6	5.5
7/27/2021	5:00 PM	47.8	48.4	49.6	50.8	56.4	3.7
7/27/2021	6:00 PM	47.5	48.0	49.0	50.2	56.1	6.3
7/27/2021	7:00 PM	49.3	49.8	50.8	51.9	60.6	8.6
7/27/2021	8:00 PM	49.9	50.3	51.3	52.3	66.5	9.2
7/27/2021	9:00 PM	52.0	48.4	49.3	50.6	79.7	8.3
7/27/2021	10:00 PM	47.9	48.3	49.0	49.7	55.5	8.9
7/27/2021	11:00 PM	45.8	46.4	47.5	48.6	55.6	8.6
7/28/2021	12:00 AM	45.8	46.7	47.7	48.7	54.7	6.7
7/28/2021	1:00 AM	44.0	44.6	46.6	48.5	56.2	6.4
7/28/2021	2:00 AM	47.1	42.9	45.0	49.7	68.6	5.8
7/28/2021	3:00 AM	42.8	43.8	45.6	47.3	52.8	4.4
7/28/2021	4:00 AM	46.1	46.8	48.2	49.6	53.6	3.7
7/28/2021	5:00 AM	48.4	49.4	50.5	51.5	65.3	4.0
7/28/2021	6:00 AM	50.7	51.6	53.4	54.7	65.9	5.5
7/28/2021	7:00 AM	46.3	46.7	48.0	49.5	61.7	4.7
7/28/2021	8:00 AM	44.3	45.0	46.3	47.4	62.9	4.4
7/28/2021	9:00 AM	43.0	43.8	45.3	47.2	57.0	3.7
7/28/2021	10:00 AM	45.0	44.8	46.5	49.4	68.5	4.0
7/28/2021	11:00 AM	42.2	42.6	44.2	46.8	54.7	4.0
7/28/2021	12:00 PM	43.3	42.9	45.1	47.6	64.0	2.8
7/28/2021	1:00 PM	42.9	42.9	45.1	47.7	59.1	1.4
7/28/2021	2:00 PM	46.1	39.8	41.7	47.0	71.5	2.5
7/28/2021	3:00 PM	41.1	41.3	43.9	46.6	57.7	2.5
7/28/2021	4:00 PM	44.4	45.6	47.0	48.9	61.2	3.7
7/28/2021	5:00 PM	50.4	48.4	49.8	53.2	76.7	4.0
7/28/2021	6:00 PM	49.5	50.1	51.3	52.5	63.7	7.2
7/28/2021	7:00 PM	50.5	50.8	52.0	53.4	70.2	7.2
7/28/2021	8:00 PM	49.9	50.6	51.7	52.8	61.6	10.0
7/28/2021	9:00 PM	48.6	49.1	50.3	51.3	55.5	9.5
7/28/2021	10:00 PM	52.5	48.1	49.8	53.6	80.0	8.6
7/28/2021	11:00 PM	46.8	47.3	48.3	49.3	58.4	7.5
7/29/2021	12:00 AM	45.7	46.2	47.2	48.4	61.5	7.5
7/29/2021	1:00 AM	45.8	46.6	47.7	48.8	58.3	8.1
7/29/2021	2:00 AM	41.5	41.9	44.4	46.6	57.2	6.7
7/29/2021	3:00 AM	49.3	45.3	48.4	56.1	71.8	3.7
7/29/2021	4:00 AM	46.8	47.7	49.3	50.4	57.1	4.6
7/29/2021	5:00 AM	50.2	50.2	51.8	53.0	75.8	4.7
7/29/2021	6:00 AM	48.4	49.1	50.8	52.0	68.7	5.5
7/29/2021	7:00 AM	46.8	47.5	48.5	49.4	55.9	5.0
7/29/2021	8:00 AM	47.9	48.0	49.3	51.5	62.8	5.0
7/29/2021	9:00 AM	46.2	46.8	47.8	48.9	55.3	3.7
7/29/2021	10:00 AM	45.1	45.4	47.8	49.9	64.0	5.0

7/29/2021	11:00 AM	49.2	49.3	51.9	55.3	66.0	3.7
7/29/2021	12:00 PM	42.3	42.5	44.7	47.0	58.9	2.2
7/29/2021	1:00 PM	42.6	42.2	44.7	49.4	63.7	0.0
7/29/2021	2:00 PM	48.6	40.9	43.5	53.7	74.3	0.6
7/29/2021	3:00 PM	41.9	41.1	43.0	47.9	59.1	3.4
7/29/2021	4:00 PM	46.0	46.5	49.2	51.3	58.0	4.0
7/29/2021	5:00 PM	48.1	48.9	50.2	51.4	58.2	4.3
7/29/2021	6:00 PM	50.3	50.8	52.2	53.5	63.1	6.1
7/29/2021	7:00 PM	50.0	50.5	52.2	53.8	62.8	7.8
7/29/2021	8:00 PM	53.3	49.1	50.8	56.2	81.2	9.2
7/29/2021	9:00 PM	46.9	47.4	48.4	49.5	57.9	10.0
7/29/2021	10:00 PM	46.3	46.6	47.6	48.4	59.9	10.0
7/29/2021	11:00 PM	46.4	47.1	48.0	49.3	59.4	9.5
7/30/2021	12:00 AM	44.8	45.1	46.5	48.2	54.6	7.8
7/30/2021	1:00 AM	44.2	44.9	45.9	47.0	53.3	7.2
7/30/2021	2:00 AM	44.6	45.1	45.9	46.7	56.9	4.0
7/30/2021	3:00 AM	51.9	44.6	46.3	53.8	76.8	3.1
7/30/2021	4:00 AM	45.6	46.9	48.4	49.5	54.4	3.4
7/30/2021	5:00 AM	46.7	47.2	48.3	49.8	58.4	3.4
7/30/2021	6:00 AM	46.2	46.4	47.5	48.6	65.7	4.0
7/30/2021	7:00 AM	45.1	45.6	46.5	48.1	56.2	3.4
7/30/2021	8:00 AM	43.1	43.8	44.8	45.7	54.5	3.1
7/30/2021	9:00 AM	44.1	44.7	46.5	47.9	59.4	3.7
7/30/2021	10:00 AM	47.5	47.0	49.2	52.0	66.6	3.4
7/30/2021	11:00 AM	46.3	46.7	47.5	48.5	65.9	3.4

Notes

1. $L_{2.5}$ = Level exceeded 2.5% (1.5 minutes) per hour
   $L_{8.3}$ = Level exceeded 8.3% (5 minutes) per hour
   L_{25} = Level exceeded 25% (15 minutes) per hour
   L_{max} = Maximum noise level measured (including impulsive noise)

Abbreviations

dBA = A-weighted decibels

mph = milse per hour

TABLE C-3: Hourly Noise Level Data, SW Site

Whitmarsh Heronry, Anacortes, WA

Date	Time	Hourly Ambient Noise Levels (dBA)					
		L_{eq}	L_{25}	$L_{8.33}$	$L_{2.5}$	L_{max}	Wind Speed
4/9/2021	2:06 PM	62.7	59.1	68.0	72.2	83.4	6.9
4/9/2021	3:00 PM	62.4	58.2	67.7	72.0	80.8	5.8
4/9/2021	4:00 PM	62.4	59.1	67.5	71.7	79.6	7.2
4/9/2021	5:00 PM	61.5	57.0	66.1	71.3	80.1	8.9
4/9/2021	6:00 PM	59.4	55.3	61.6	69.3	79.1	9.5
4/9/2021	7:00 PM	56.8	54.2	58.0	65.8	76.5	11.5
4/9/2021	8:00 PM	57.9	53.7	59.9	67.9	76.2	12.0
4/9/2021	9:00 PM	56.6	51.4	57.2	66.4	76.1	11.8
4/9/2021	10:00 PM	57.7	49.5	56.7	67.0	83.0	14.7
4/9/2021	11:00 PM	54.8	42.5	49.0	61.9	78.7	13.9
4/10/2021	12:00 AM	57.0	42.3	53.2	64.5	83.9	14.7
4/10/2021	1:00 AM	56.0	47.2	54.4	65.5	80.3	14.7
4/10/2021	2:00 AM	51.5	50.7	53.5	56.5	74.1	19.0
4/10/2021	3:00 AM	47.1	45.1	47.9	51.3	72.5	22.2
4/10/2021	4:00 AM	46.6	42.5	47.5	54.4	70.6	19.4
4/10/2021	5:00 AM	53.6	44.6	49.1	61.9	79.7	11.8
4/10/2021	6:00 AM	56.2	47.3	54.1	66.2	77.7	7.8
4/10/2021	7:00 AM	56.3	48.6	57.2	65.8	77.6	5.5
4/10/2021	8:00 AM	56.6	44.4	57.6	67.2	77.5	16.1
4/10/2021	9:00 AM	58.6	50.9	62.5	69.3	76.9	20.7
4/10/2021	10:00 AM	58.2	49.7	62.0	68.7	78.0	20.5
4/10/2021	11:00 AM	59.8	52.9	64.2	70.5	78.7	15.5
4/10/2021	12:00 PM	60.3	52.7	64.1	70.4	83.5	15.3
4/10/2021	1:00 PM	60.7	54.2	65.4	70.9	78.6	12.6
4/10/2021	2:00 PM	59.7	53.0	64.1	70.2	78.1	10.3
4/10/2021	3:00 PM	60.9	54.2	65.7	71.2	80.4	11.7
4/10/2021	4:00 PM	61.1	56.3	66.3	71.1	80.3	11.1
4/10/2021	5:00 PM	59.5	53.3	63.8	70.0	79.0	9.2
4/10/2021	6:00 PM	59.1	49.7	62.6	69.8	78.4	6.9
4/10/2021	7:00 PM	57.2	42.7	57.3	67.4	79.2	8.1
4/10/2021	8:00 PM	58.5	44.3	57.1	67.0	86.9	11.5
4/10/2021	9:00 PM	58.8	42.5	58.9	68.4	84.8	6.4
4/10/2021	10:00 PM	53.4	38.9	51.1	63.3	77.1	9.7
4/10/2021	11:00 PM	52.7	45.0	48.7	60.5	77.1	7.5
4/11/2021	12:00 AM	50.3	44.9	50.9	55.1	74.4	5.8
4/11/2021	1:00 AM	54.3	44.0	49.3	63.0	76.2	5.3
4/11/2021	2:00 AM	49.5	41.5	44.8	52.9	76.9	6.9
4/11/2021	3:00 AM	55.0	41.4	59.0	64.2	82.6	2.3
4/11/2021	4:00 AM	50.2	42.9	45.6	53.0	76.9	2.2
4/11/2021	5:00 AM	50.6	47.0	49.5	52.6	76.2	1.7
4/11/2021	6:00 AM	54.9	46.3	50.7	62.4	81.7	2.0
4/11/2021	7:00 AM	54.1	47.4	51.1	62.0	78.5	2.0
4/11/2021	8:00 AM	57.4	46.4	58.1	68.0	78.1	1.7
4/11/2021	9:00 AM	58.0	50.0	61.3	68.4	79.3	1.7
4/11/2021	10:00 AM	58.0	47.8	60.6	68.7	79.9	3.2
4/11/2021	11:00 AM	59.4	47.6	61.8	69.7	83.5	8.6
4/11/2021	12:00 PM	59.3	50.6	63.6	69.9	77.7	4.3
4/11/2021	1:00 PM	59.6	51.3	64.5	70.0	77.8	2.0
4/11/2021	2:00 PM	60.3	54.2	64.8	70.1	80.3	2.0
4/11/2021	3:00 PM	60.0	54.9	65.4	70.2	78.3	2.0
4/11/2021	4:00 PM	61.4	56.5	66.2	71.1	83.3	1.7
4/11/2021	5:00 PM	58.7	50.7	62.5	69.3	77.4	1.7
4/11/2021	6:00 PM	58.1	45.3	59.7	68.1	84.0	5.5
4/11/2021	7:00 PM	57.4	40.9	57.4	68.0	82.3	10.0
4/11/2021	8:00 PM	56.7	40.8	53.8	64.0	86.8	11.5
4/11/2021	9:00 PM	55.0	36.4	49.5	64.4	78.6	13.0
4/11/2021	10:00 PM	50.3	33.7	37.9	53.0	76.7	13.3

4/11/2021	11:00 PM	53.6	33.4	47.5	61.4	79.4	13.9
4/12/2021	12:00 AM	51.4	33.9	41.5	58.2	75.3	13.0
4/12/2021	1:00 AM	54.6	41.8	52.5	61.0	83.5	12.8
4/12/2021	2:00 AM	44.3	38.0	40.6	43.2	73.4	11.7
4/12/2021	3:00 AM	46.9	40.7	42.7	45.5	72.1	9.7
4/12/2021	4:00 AM	53.9	43.7	46.8	61.1	78.1	10.3
4/12/2021	5:00 AM	58.2	50.0	60.6	69.1	76.0	7.8
4/12/2021	6:00 AM	65.7	64.2	71.8	74.7	80.4	5.5
4/12/2021	7:00 AM	60.7	53.3	64.6	71.0	80.1	3.1
4/12/2021	8:00 AM	58.7	49.3	62.6	69.7	78.3	1.4
4/12/2021	9:00 AM	59.4	49.8	63.1	70.1	78.5	3.5
4/12/2021	10:00 AM	61.0	55.4	66.1	70.9	81.2	0.3
4/12/2021	11:00 AM	60.1	52.9	64.9	70.7	77.2	3.4
4/12/2021	12:00 PM	61.4	56.9	66.7	71.3	80.2	0.6
4/12/2021	1:00 PM	63.5	57.1	67.2	72.0	87.7	2.6
4/12/2021	2:00 PM	62.1	57.0	67.1	71.8	81.3	2.5
4/12/2021	3:00 PM	62.6	59.2	67.8	72.2	83.5	3.7
4/12/2021	4:00 PM	61.7	57.6	67.0	71.5	78.3	4.9
4/12/2021	5:00 PM	62.1	56.8	66.5	71.7	84.4	10.0
4/12/2021	6:00 PM	58.3	50.5	61.3	68.8	77.8	9.2
4/12/2021	7:00 PM	56.4	47.6	56.1	66.4	82.2	15.3
4/12/2021	8:00 PM	54.8	46.4	53.7	62.7	78.3	19.6
4/12/2021	9:00 PM	54.3	42.8	52.1	63.6	76.3	20.2
4/12/2021	10:00 PM	49.7	40.3	43.2	52.7	75.4	17.8
4/12/2021	11:00 PM	52.8	35.5	44.5	59.8	76.1	15.3
4/13/2021	12:00 AM	49.4	38.5	42.1	53.5	78.2	13.6
4/13/2021	1:00 AM	51.6	41.4	46.6	57.9	78.0	12.8
4/13/2021	2:00 AM	49.0	40.4	43.0	47.7	78.3	9.7
4/13/2021	3:00 AM	44.4	40.4	42.3	44.2	74.3	6.1
4/13/2021	4:00 AM	54.8	41.2	45.4	62.4	77.8	6.9
4/13/2021	5:00 AM	58.6	53.7	61.5	69.1	78.4	6.4
4/13/2021	6:00 AM	65.4	64.6	71.5	73.9	79.5	6.4
4/13/2021	7:00 AM	60.2	53.2	64.8	70.5	79.2	8.1
4/13/2021	8:00 AM	60.0	53.1	63.9	70.1	80.3	10.3
4/13/2021	9:00 AM	61.3	52.8	64.6	71.6	84.6	9.5
4/13/2021	10:00 AM	57.6	51.5	61.9	67.8	77.1	7.2
4/13/2021	11:00 AM	61.6	57.1	67.3	71.4	78.9	4.3
4/13/2021	12:00 PM	61.5	57.5	67.1	71.4	77.4	4.4
4/13/2021	1:00 PM	60.9	56.0	66.6	70.9	79.6	4.6
4/13/2021	2:00 PM	61.3	56.2	66.0	71.4	81.5	3.1
4/13/2021	3:00 PM	62.1	59.7	67.6	71.3	79.3	4.0
4/13/2021	4:00 PM	61.7	58.5	67.1	71.1	82.2	6.7
4/13/2021	5:00 PM	61.1	57.3	66.2	71.2	78.1	9.2
4/13/2021	6:00 PM	58.4	50.3	61.6	68.6	81.1	10.0
4/13/2021	7:00 PM	56.2	45.8	57.7	66.5	76.6	12.6
4/13/2021	8:00 PM	56.0	44.9	57.2	66.0	82.9	16.7
4/13/2021	9:00 PM	54.0	42.8	52.5	64.2	74.0	17.5
4/13/2021	10:00 PM	52.6	39.4	47.2	61.0	77.2	18.1
4/13/2021	11:00 PM	53.7	37.2	47.5	61.0	83.6	17.2
4/14/2021	12:00 AM	51.6	36.4	50.5	59.2	73.7	16.7
4/14/2021	1:00 AM	50.9	43.7	45.1	48.7	81.9	15.3
4/14/2021	2:00 AM	50.7	41.0	44.5	52.8	77.5	17.8
4/14/2021	3:00 AM	41.2	41.3	44.3	46.1	64.2	17.8
4/14/2021	4:00 AM	54.9	46.9	54.3	63.5	76.6	14.1
4/14/2021	5:00 AM	60.3	52.8	64.6	70.1	84.3	11.8
4/14/2021	6:00 AM	65.3	63.8	71.3	74.1	83.9	9.2
4/14/2021	7:00 AM	60.9	55.2	65.2	71.1	81.7	6.1
4/14/2021	8:00 AM	59.2	52.0	63.5	69.6	77.6	6.7
4/14/2021	9:00 AM	61.2	51.0	64.0	71.0	86.2	5.8
4/14/2021	10:00 AM	58.9	50.7	63.7	69.4	77.0	4.3
4/14/2021	11:00 AM	61.1	57.2	66.5	71.0	80.3	3.2
4/14/2021	12:00 PM	61.2	57.3	66.9	71.0	78.4	0.3
4/14/2021	1:00 PM	61.0	57.6	66.6	70.5	80.2	1.7

4/14/2021	2:00 PM	61.4	56.7	66.1	70.9	86.5	1.7
4/14/2021	3:00 PM	61.3	58.3	66.8	71.4	78.1	0.3
4/14/2021	4:00 PM	62.5	58.8	67.9	72.1	81.3	4.6
4/14/2021	5:00 PM	62.1	56.9	67.1	71.9	84.4	6.1
4/14/2021	6:00 PM	59.2	50.8	63.2	69.8	79.3	9.2
4/14/2021	7:00 PM	56.5	47.0	58.0	67.2	76.5	16.9
4/14/2021	8:00 PM	57.5	46.9	59.3	67.2	83.3	16.4
4/14/2021	9:00 PM	52.9	40.7	49.8	61.8	79.6	16.7
4/14/2021	10:00 PM	54.7	43.9	51.9	65.0	76.8	17.5
4/14/2021	11:00 PM	53.1	43.0	47.9	60.7	77.2	16.7
4/15/2021	12:00 AM	52.0	41.7	50.7	59.4	74.8	16.1
4/15/2021	1:00 AM	45.4	38.2	40.3	43.7	72.7	12.4
4/15/2021	2:00 AM	45.8	41.0	44.1	48.0	72.4	11.5
4/15/2021	3:00 AM	46.3	43.5	46.1	48.8	71.9	6.1
4/15/2021	4:00 AM	56.4	49.3	58.6	65.0	77.8	4.9
4/15/2021	5:00 AM	60.1	53.5	64.2	70.7	79.8	2.5
4/15/2021	6:00 AM	65.2	64.2	71.3	74.1	79.8	0.3
4/15/2021	7:00 AM	60.8	54.8	65.4	70.8	79.4	1.7
4/15/2021	8:00 AM	59.7	53.3	63.1	69.8	80.2	2.5
4/15/2021	9:00 AM	58.8	50.9	61.8	68.9	80.2	1.1
4/15/2021	10:00 AM	59.1	46.6	60.4	69.1	83.6	1.4
4/15/2021	11:00 AM	61.4	57.4	66.7	71.1	79.1	1.7
4/29/2021	1:00 PM	61.5	55.3	65.5	70.8	85.3	1.7
4/29/2021	2:00 PM	60.0	54.4	64.5	70.3	80.1	0.3
4/29/2021	3:00 PM	61.0	57.5	66.3	70.5	79.6	3.8
4/29/2021	4:00 PM	61.7	58.7	67.2	71.0	80.3	4.0
4/29/2021	5:00 PM	62.3	58.0	67.2	72.0	86.0	5.5
4/29/2021	6:00 PM	59.2	51.7	63.4	69.6	81.7	7.5
4/29/2021	7:00 PM	57.4	44.3	59.4	67.8	78.5	6.7
4/29/2021	8:00 PM	55.8	45.6	64.9	66.3	75.0	6.7
4/29/2021	9:00 PM	58.7	42.3	50.2	63.1	96.5	6.9
4/29/2021	10:00 PM	54.4	39.8	53.5	64.6	77.3	8.3
4/29/2021	11:00 PM	51.5	41.4	45.0	57.4	75.4	9.5
4/30/2021	12:00 AM	49.8	42.0	46.2	55.7	72.7	6.4
4/30/2021	1:00 AM	52.3	43.0	47.6	59.9	75.8	3.7
4/30/2021	2:00 AM	48.2	39.1	46.1	55.5	73.7	5.8
4/30/2021	3:00 AM	38.0	37.9	40.6	46.9	53.4	4.3
4/30/2021	4:00 AM	53.3	46.1	50.8	61.5	76.0	5.2
4/30/2021	5:00 AM	56.4	52.6	57.1	65.6	77.2	5.3
4/30/2021	6:00 AM	61.7	57.7	66.8	71.8	78.8	6.1
4/30/2021	7:00 AM	60.1	55.6	63.9	69.9	76.4	6.1
4/30/2021	8:00 AM	60.1	55.3	64.2	70.0	81.0	5.3
4/30/2021	9:00 AM	61.0	55.4	65.2	71.0	82.5	1.1
4/30/2021	10:00 AM	59.5	54.8	63.8	69.7	76.8	1.7
4/30/2021	11:00 AM	61.0	57.1	66.0	70.8	78.0	4.0
4/30/2021	12:00 PM	61.1	56.8	66.3	70.6	83.5	6.7
4/30/2021	1:00 PM	60.8	56.9	65.7	70.4	81.0	10.0
4/30/2021	2:00 PM	61.3	56.2	66.2	71.0	80.4	9.7
4/30/2021	3:00 PM	61.2	55.7	65.9	70.8	84.9	10.8
4/30/2021	4:00 PM	61.1	56.7	66.4	71.0	78.4	11.5
4/30/2021	5:00 PM	60.1	55.4	65.1	70.2	80.2	10.6
4/30/2021	6:00 PM	59.4	52.4	63.6	69.8	78.7	8.9
4/30/2021	7:00 PM	59.2	50.4	61.4	69.3	81.0	9.7
4/30/2021	8:00 PM	53.8	42.7	52.3	62.9	79.5	11.7
4/30/2021	9:00 PM	55.9	41.0	55.5	66.0	77.5	9.5
4/30/2021	10:00 PM	53.9	39.6	45.9	61.7	80.5	8.3
4/30/2021	11:00 PM	53.6	39.9	52.0	62.3	78.0	7.8
5/1/2021	12:00 AM	54.3	37.8	53.7	64.0	77.3	7.8
5/1/2021	1:00 AM	51.7	34.8	43.2	59.8	75.4	8.6
5/1/2021	2:00 AM	49.4	34.3	40.6	57.7	75.9	5.8
5/1/2021	3:00 AM	34.6	35.2	37.7	39.7	45.7	3.1
5/1/2021	4:00 AM	52.8	37.6	56.5	63.0	78.2	4.0
5/1/2021	5:00 AM	52.2	45.9	50.5	59.7	75.1	2.8
5/1/2021	6:00 AM	56.0	42.9	54.0	65.2	79.0	5.8
5/1/2021	7:00 AM	56.7	43.7	56.2	66.6	80.2	5.7

5/1/2021	8:00 AM	57.7	48.9	61.4	67.9	77.9	7.5
5/1/2021	9:00 AM	58.3	50.4	60.3	68.9	76.9	2.9
5/1/2021	10:00 AM	60.4	53.5	64.5	70.3	82.7	5.5
5/1/2021	11:00 AM	58.8	50.7	62.6	69.4	77.4	2.3
5/1/2021	12:00 PM	58.9	53.1	63.5	69.0	76.5	3.1
5/1/2021	1:00 PM	58.7	52.7	63.0	69.2	76.2	3.1
5/1/2021	2:00 PM	59.7	53.2	63.4	69.4	85.2	3.1
5/1/2021	3:00 PM	60.2	54.9	64.6	70.3	79.0	4.4
5/1/2021	4:00 PM	59.3	51.4	63.8	69.5	80.0	5.5
5/1/2021	5:00 PM	61.1	55.4	66.1	70.8	86.2	7.2
5/1/2021	6:00 PM	59.5	53.1	64.1	69.8	80.2	9.2
5/1/2021	7:00 PM	57.1	45.5	59.8	68.0	76.8	12.8
5/1/2021	8:00 PM	55.7	43.8	56.7	65.7	79.5	14.1
5/1/2021	9:00 PM	56.3	41.0	56.8	66.8	77.8	13.6
5/1/2021	10:00 PM	55.1	38.0	54.2	65.0	78.2	13.3
5/1/2021	11:00 PM	53.9	37.5	51.1	63.1	77.2	10.3
5/2/2021	12:00 AM	51.8	34.5	43.8	59.8	75.4	9.5
5/2/2021	1:00 AM	48.8	34.4	39.3	52.5	74.7	8.3
5/2/2021	2:00 AM	47.7	31.6	33.7	51.6	74.5	8.9
5/2/2021	3:00 AM	46.1	34.5	43.1	52.8	74.5	6.7
5/2/2021	4:00 AM	51.5	38.6	49.3	58.0	77.3	3.7
5/2/2021	5:00 AM	50.7	45.7	51.5	58.0	74.1	4.4
5/2/2021	6:00 AM	53.2	46.8	53.6	61.7	75.1	3.7
5/2/2021	7:00 AM	55.7	47.5	55.0	65.8	76.8	3.7
5/2/2021	8:00 AM	51.3	43.9	51.7	59.9	74.4	6.1
5/2/2021	9:00 AM	58.7	52.2	62.8	69.1	77.7	4.0
5/2/2021	10:00 AM	57.4	49.7	61.4	68.0	75.7	5.0
5/2/2021	11:00 AM	59.4	52.2	63.2	69.3	82.1	4.0
5/2/2021	12:00 PM	58.9	52.1	63.1	69.4	78.8	5.3
5/2/2021	1:00 PM	58.8	53.0	63.5	69.3	76.4	4.4
5/2/2021	2:00 PM	58.3	50.7	61.9	68.9	76.9	5.0
5/2/2021	3:00 PM	60.0	54.8	64.6	70.1	79.3	5.2
5/2/2021	4:00 PM	60.2	53.5	64.2	69.7	85.0	4.0
5/2/2021	5:00 PM	57.9	49.7	61.2	68.5	78.7	4.6
5/2/2021	6:00 PM	58.3	47.5	60.1	68.3	81.6	5.3
5/2/2021	7:00 PM	55.8	44.3	56.6	66.3	79.1	3.4
5/2/2021	8:00 PM	54.3	43.7	53.8	64.5	75.5	5.8
5/2/2021	9:00 PM	55.3	39.2	52.7	64.2	82.0	6.7
5/2/2021	10:00 PM	52.4	38.6	48.6	60.7	77.8	5.8
5/2/2021	11:00 PM	52.1	41.2	49.2	60.7	74.4	5.8
5/3/2021	12:00 AM	50.2	40.1	43.4	55.3	75.9	6.4
5/3/2021	1:00 AM	51.0	37.8	42.7	58.4	75.6	6.9
5/3/2021	2:00 AM	33.6	34.3	35.7	36.9	52.3	6.7
5/3/2021	3:00 AM	46.8	37.6	41.7	52.9	72.6	4.0
5/3/2021	4:00 AM	54.9	46.9	53.8	64.7	77.3	2.2
5/3/2021	5:00 AM	59.5	53.3	62.3	69.7	80.3	4.4
5/3/2021	6:00 AM	65.6	65.3	71.5	73.9	79.7	3.5
5/3/2021	7:00 AM	60.9	55.5	66.0	71.2	77.0	3.1
5/3/2021	8:00 AM	58.8	51.1	61.6	68.8	79.7	2.8
5/3/2021	9:00 AM	59.2	52.5	62.6	69.2	80.2	3.1
5/3/2021	10:00 AM	60.0	55.0	64.8	69.8	79.1	4.0
5/3/2021	11:00 AM	60.4	54.9	65.0	70.3	79.4	4.7
5/3/2021	12:00 PM	62.2	59.1	67.3	71.4	82.0	5.0
5/3/2021	1:00 PM	61.1	56.5	65.3	70.8	82.7	3.1
5/3/2021	2:00 PM	60.2	55.2	64.5	69.9	81.2	3.1
5/3/2021	3:00 PM	62.2	59.9	67.8	71.4	81.9	6.6
5/3/2021	4:00 PM	60.6	56.5	65.5	70.5	80.0	8.9
5/3/2021	5:00 PM	62.3	58.7	67.4	71.9	80.1	8.6
5/3/2021	6:00 PM	58.7	52.0	62.5	69.2	78.3	8.9
5/3/2021	7:00 PM	55.9	48.4	57.7	66.3	77.6	9.7
5/3/2021	8:00 PM	55.7	47.2	56.0	65.5	75.6	9.7
5/3/2021	9:00 PM	54.4	44.7	54.9	63.4	77.3	7.8
5/3/2021	10:00 PM	51.8	42.7	48.2	59.4	77.1	9.2
5/3/2021	11:00 PM	51.9	39.7	45.6	59.3	76.8	8.9
5/4/2021	12:00 AM	51.8	33.1	40.1	59.3	74.6	8.9
5/4/2021	1:00 AM	49.2	33.5	35.4	55.1	75.1	8.9
5/4/2021	2:00 AM	47.2	35.1	38.3	54.4	73.2	7.5

5/4/2021	3:00 AM	43.7	34.5	36.9	45.5	70.8	6.7
5/4/2021	4:00 AM	55.6	34.3	52.0	64.8	82.3	5.3
5/4/2021	5:00 AM	58.7	50.3	62.0	69.4	81.3	3.4
5/4/2021	6:00 AM	65.6	65.7	71.7	73.8	79.7	4.0
5/4/2021	7:00 AM	60.6	56.3	64.8	70.3	79.8	2.8
5/4/2021	8:00 AM	59.2	52.4	62.0	69.5	80.5	4.3
5/4/2021	9:00 AM	59.7	55.1	64.3	70.1	77.9	4.7
5/4/2021	10:00 AM	59.5	54.4	63.6	69.7	80.5	3.7
5/4/2021	11:00 AM	60.1	56.5	65.3	70.1	77.8	1.7
5/4/2021	12:00 PM	61.5	58.2	66.6	70.8	80.7	2.0
5/4/2021	1:00 PM	59.7	54.6	63.8	69.8	81.9	4.1
5/4/2021	2:00 PM	60.9	57.4	66.1	70.3	79.1	5.3
5/4/2021	3:00 PM	60.4	56.4	65.6	70.2	78.7	2.5
5/4/2021	4:00 PM	61.6	56.5	65.7	70.7	96.6	3.1
5/4/2021	5:00 PM	62.7	59.3	68.2	72.0	78.9	3.1
5/4/2021	6:00 PM	58.4	48.4	61.8	69.1	78.2	3.4
5/4/2021	7:00 PM	56.9	47.2	59.6	67.4	77.5	5.3
5/4/2021	8:00 PM	57.1	46.5	58.2	67.4	80.3	4.9
5/4/2021	9:00 PM	54.9	42.7	54.6	64.7	76.9	6.9
5/4/2021	10:00 PM	50.6	39.4	47.6	58.3	74.4	7.8
5/4/2021	11:00 PM	55.9	44.2	54.7	65.5	79.2	8.6
5/5/2021	12:00 AM	52.5	40.1	45.6	59.6	76.9	9.2
5/5/2021	1:00 AM	52.1	41.2	48.5	56.9	76.6	8.6
5/5/2021	2:00 AM	52.8	40.7	45.5	58.6	84.3	6.7
5/5/2021	3:00 AM	52.1	41.0	45.6	58.4	81.9	4.9
5/5/2021	4:00 AM	56.1	47.3	54.8	65.5	79.8	2.2
5/5/2021	5:00 AM	60.5	54.9	64.6	70.7	79.0	2.8
5/5/2021	6:00 AM	66.1	65.7	71.7	74.5	82.5	1.4
5/5/2021	7:00 AM	61.2	54.4	65.2	71.5	81.7	0.6
5/5/2021	8:00 AM	60.6	54.3	64.5	70.6	79.7	1.1
5/5/2021	9:00 AM	59.9	52.2	63.2	70.1	80.0	0.6
5/5/2021	10:00 AM	60.6	55.1	65.6	70.6	79.7	1.1
5/5/2021	11:00 AM	62.5	57.1	66.7	71.8	84.6	2.0
5/5/2021	12:00 PM	61.5	58.2	67.3	71.0	82.5	1.4
5/5/2021	1:00 PM	60.3	54.9	65.3	70.3	79.5	2.6
5/5/2021	2:00 PM	59.8	55.3	64.1	69.5	79.0	2.0
5/5/2021	3:00 PM	62.1	57.2	66.7	71.3	85.8	5.5
5/5/2021	4:00 PM	61.7	57.8	67.0	71.2	80.0	5.5
5/5/2021	5:00 PM	62.1	58.6	67.3	71.5	83.8	8.9
5/5/2021	6:00 PM	59.8	53.9	64.2	70.0	81.8	10.0
5/5/2021	7:00 PM	57.1	47.8	58.8	67.5	79.4	9.2
5/5/2021	8:00 PM	56.1	47.8	57.3	66.3	77.2	8.3
5/5/2021	9:00 PM	54.1	44.9	51.5	63.4	77.5	10.3
5/5/2021	10:00 PM	51.1	45.3	49.5	59.6	74.9	15.0
5/5/2021	11:00 PM	50.9	44.3	47.1	55.7	76.3	12.1
5/6/2021	12:00 AM	47.7	43.9	47.2	50.5	73.5	13.0
5/6/2021	1:00 AM	48.9	43.9	47.8	53.0	73.3	11.5
5/6/2021	2:00 AM	47.0	41.9	45.2	50.7	73.2	9.2
5/6/2021	3:00 AM	48.6	43.3	46.6	49.6	76.1	8.1
5/6/2021	4:00 AM	54.4	47.7	55.3	62.5	80.2	6.7
5/6/2021	5:00 AM	57.5	50.1	59.6	67.9	77.9	8.6
5/6/2021	6:00 AM	65.6	65.1	71.5	74.0	83.4	9.2
5/6/2021	7:00 AM	60.6	55.5	65.1	70.5	81.3	6.9
5/6/2021	8:00 AM	59.4	52.8	62.5	69.3	80.0	4.0
5/6/2021	9:00 AM	58.8	52.4	60.9	68.4	82.9	2.9
5/6/2021	10:00 AM	58.6	52.5	61.8	68.9	81.2	1.7
5/6/2021	11:00 AM	60.0	54.9	64.6	69.8	80.2	2.2
5/6/2021	12:00 PM	61.5	58.0	66.7	71.0	79.2	2.8
5/6/2021	1:00 PM	60.5	56.2	64.8	70.1	81.8	4.9
5/6/2021	2:00 PM	60.8	57.0	65.8	70.2	79.5	5.5
5/6/2021	3:00 PM	61.4	57.5	66.1	71.1	80.4	6.3
5/6/2021	4:00 PM	62.0	59.1	67.1	71.4	78.4	12.1
5/6/2021	5:00 PM	63.3	60.7	68.8	72.4	79.7	16.4
5/6/2021	6:00 PM	57.8	50.4	58.8	68.6	77.3	17.8
5/6/2021	7:00 PM	58.3	48.5	60.8	68.5	80.2	22.5
5/6/2021	8:00 PM	58.0	56.3	59.1	66.7	79.3	24.4
5/6/2021	9:00 PM	55.0	53.0	55.7	60.9	76.5	23.0

5/6/2021	10:00 PM	54.8	52.0	53.9	62.2	77.9	21.6
5/6/2021	11:00 PM	52.7	49.9	52.0	56.2	76.8	17.3
5/7/2021	12:00 AM	53.4	54.1	56.0	57.6	71.7	16.9
5/7/2021	1:00 AM	51.8	50.7	53.7	55.5	74.1	17.3
5/7/2021	2:00 AM	48.0	46.7	49.7	51.8	73.4	11.5
5/7/2021	3:00 AM	48.0	43.4	46.0	48.7	76.1	6.4
5/7/2021	4:00 AM	54.8	51.3	54.4	63.1	79.4	3.1
5/7/2021	5:00 AM	57.5	50.2	60.3	67.7	77.6	3.7
5/7/2021	6:00 AM	61.4	53.9	66.3	72.0	79.6	5.0
5/7/2021	7:00 AM	59.3	50.9	62.6	69.7	77.6	4.4
5/7/2021	8:00 AM	59.6	53.7	61.9	69.5	81.6	6.4
5/7/2021	9:00 AM	61.4	56.5	66.6	71.5	78.6	5.8
5/7/2021	10:00 AM	60.1	54.5	64.3	70.1	80.5	4.4
5/7/2021	11:00 AM	61.9	57.8	67.1	71.8	79.8	4.0
5/28/2021	12:00 PM	59.6	55.1	64.4	69.5	80.8	9.5
5/28/2021	1:00 PM	59.8	55.8	64.5	69.6	79.0	6.9
5/28/2021	2:00 PM	60.6	57.0	66.0	70.2	77.5	9.5
5/28/2021	3:00 PM	61.1	56.6	65.6	70.4	85.6	10.6
5/28/2021	4:00 PM	60.2	56.6	65.3	70.1	76.1	10.9
5/28/2021	5:00 PM	59.5	53.9	63.9	69.7	77.6	6.7
5/28/2021	6:00 PM	59.1	53.7	63.6	68.9	78.7	5.2
5/28/2021	7:00 PM	57.2	49.3	59.4	67.6	77.5	6.1
5/28/2021	8:00 PM	58.2	49.5	59.4	67.6	86.1	8.9
5/28/2021	9:00 PM	56.3	49.2	58.7	66.5	77.2	8.6
5/28/2021	10:00 PM	54.3	44.1	53.8	64.2	75.5	9.7
5/28/2021	11:00 PM	51.8	42.3	46.5	58.5	75.1	10.3
5/29/2021	12:00 AM	50.4	42.8	46.6	57.8	74.1	10.8
5/29/2021	1:00 AM	48.4	37.7	41.2	50.1	75.1	9.7
5/29/2021	2:00 AM	51.1	40.7	44.6	51.0	81.2	6.4
5/29/2021	3:00 AM	50.0	43.0	46.9	54.8	78.2	3.7
5/29/2021	4:00 AM	51.1	48.0	51.3	57.8	73.5	1.1
5/29/2021	5:00 AM	54.4	49.3	53.1	61.2	80.5	2.2
5/29/2021	6:00 AM	57.8	51.4	59.1	67.8	79.8	2.2
5/29/2021	7:00 AM	56.0	50.2	58.0	65.8	76.9	3.4
5/29/2021	8:00 AM	56.8	49.0	57.6	66.5	82.0	1.1
5/29/2021	9:00 AM	57.7	51.1	60.8	68.1	76.5	0.8
5/29/2021	10:00 AM	59.2	53.3	63.7	69.5	78.4	0.8
5/29/2021	11:00 AM	59.2	53.0	63.0	69.3	78.9	1.4
5/29/2021	12:00 PM	59.3	54.5	63.5	69.4	79.3	2.2
5/29/2021	1:00 PM	58.9	53.8	63.3	68.7	81.4	4.9
5/29/2021	2:00 PM	58.1	50.9	61.8	68.2	82.7	4.9
5/29/2021	3:00 PM	59.1	52.8	62.9	68.8	85.7	4.0
5/29/2021	4:00 PM	59.8	54.6	64.0	69.4	86.5	6.4
5/29/2021	5:00 PM	59.7	54.5	64.5	69.9	78.8	8.1
5/29/2021	6:00 PM	57.4	49.2	58.5	67.7	83.6	8.6
5/29/2021	7:00 PM	56.7	50.6	60.0	67.2	75.4	9.7
5/29/2021	8:00 PM	55.6	49.1	58.0	66.0	74.8	12.8
5/29/2021	9:00 PM	54.9	47.6	57.9	64.6	75.3	12.4
5/29/2021	10:00 PM	60.2	48.5	63.6	70.0	83.2	11.4
5/29/2021	11:00 PM	54.2	40.2	51.3	63.3	80.9	11.5
5/30/2021	12:00 AM	52.8	42.6	47.7	60.8	77.2	12.1
5/30/2021	1:00 AM	51.7	42.4	46.9	58.9	75.5	9.7
5/30/2021	2:00 AM	49.8	41.2	48.4	57.7	76.4	8.1
5/30/2021	3:00 AM	46.5	40.3	44.7	50.4	74.2	5.3
5/30/2021	4:00 AM	50.9	47.3	52.1	57.8	72.7	3.4
5/30/2021	5:00 AM	52.5	48.8	53.2	60.4	74.4	1.4
5/30/2021	6:00 AM	56.0	49.5	56.3	65.6	77.5	1.1
5/30/2021	7:00 AM	53.8	47.5	53.2	62.1	76.5	1.7
5/30/2021	8:00 AM	53.7	48.4	55.6	63.0	74.1	1.1
5/30/2021	9:00 AM	55.7	47.8	55.6	65.3	78.8	0.3
5/30/2021	10:00 AM	56.5	49.3	59.2	66.8	76.4	2.2
5/30/2021	11:00 AM	56.4	47.7	58.4	67.1	77.2	1.4
5/30/2021	12:00 PM	57.9	50.5	60.9	68.4	78.2	1.4
5/30/2021	1:00 PM	58.0	52.3	62.0	68.2	77.3	2.5
5/30/2021	2:00 PM	58.2	53.2	62.4	68.3	77.0	2.5
5/30/2021	3:00 PM	58.6	54.0	63.4	68.8	75.9	2.5

5/30/2021	4:00 PM	58.4	54.1	62.0	68.4	77.3	3.4
5/30/2021	5:00 PM	58.9	54.1	63.5	68.9	77.3	3.7
5/30/2021	6:00 PM	57.4	48.7	59.7	67.9	77.0	6.1
5/30/2021	7:00 PM	55.3	46.9	56.1	65.7	75.6	9.2
5/30/2021	8:00 PM	56.9	48.3	58.1	66.4	79.1	10.6
5/30/2021	9:00 PM	55.6	44.2	55.1	65.4	83.0	11.2
5/30/2021	10:00 PM	52.3	40.8	49.2	61.7	73.3	9.5
5/30/2021	11:00 PM	50.3	36.8	40.7	50.8	77.8	8.9
5/31/2021	12:00 AM	53.0	40.2	52.2	63.2	73.5	7.8
5/31/2021	1:00 AM	47.6	35.8	37.8	46.2	72.9	6.9
5/31/2021	2:00 AM	41.6	36.0	40.9	51.0	65.4	7.8
5/31/2021	3:00 AM	42.1	33.3	36.0	41.7	71.0	8.3
5/31/2021	4:00 AM	49.1	45.5	48.5	53.3	73.7	4.3
5/31/2021	5:00 AM	51.5	46.4	50.7	58.4	73.8	3.7
5/31/2021	6:00 AM	54.1	47.5	53.2	63.3	75.6	3.5
5/31/2021	7:00 AM	55.3	46.7	53.6	64.0	79.7	0.0
5/31/2021	8:00 AM	53.4	45.1	52.5	62.4	75.3	0.3
5/31/2021	9:00 AM	56.3	49.9	58.4	66.5	77.1	0.8
5/31/2021	10:00 AM	57.0	51.4	60.8	67.4	76.0	1.7
5/31/2021	11:00 AM	58.3	51.2	61.3	68.3	81.1	0.8
5/31/2021	12:00 PM	59.5	53.5	63.7	70.0	80.4	0.6
5/31/2021	1:00 PM	58.1	51.6	61.6	68.3	80.8	0.3
5/31/2021	2:00 PM	58.1	50.4	61.4	67.8	84.7	0.6
5/31/2021	3:00 PM	57.8	50.7	61.9	68.4	75.5	3.1
5/31/2021	4:00 PM	57.4	50.2	61.1	68.0	75.6	4.3
5/31/2021	5:00 PM	56.8	49.5	60.1	66.6	81.2	6.4
5/31/2021	6:00 PM	58.2	51.3	61.6	68.5	79.8	7.8
5/31/2021	7:00 PM	56.0	47.4	58.2	66.5	76.3	9.2
5/31/2021	8:00 PM	56.5	47.3	57.4	66.9	79.0	9.5
5/31/2021	9:00 PM	56.4	43.3	53.2	63.6	88.8	10.3
5/31/2021	10:00 PM	52.5	36.6	46.8	60.5	74.4	9.5
5/31/2021	11:00 PM	50.7	37.0	46.1	59.3	73.9	9.5
6/1/2021	12:00 AM	50.8	39.4	43.9	58.0	73.2	9.5
6/1/2021	1:00 AM	47.9	39.6	42.4	52.7	71.1	12.1
6/1/2021	2:00 AM	44.6	38.1	42.4	54.0	71.6	8.1
6/1/2021	3:00 AM	40.9	37.2	39.2	41.8	70.2	5.3
6/1/2021	4:00 AM	51.9	46.8	49.9	57.8	74.9	8.1
6/1/2021	5:00 AM	58.8	50.9	62.8	69.5	78.2	5.5
6/1/2021	6:00 AM	65.3	65.1	71.1	73.6	82.4	4.0
6/1/2021	7:00 AM	59.0	53.1	63.2	69.0	78.5	2.2
6/1/2021	8:00 AM	57.9	51.0	60.7	68.3	79.8	0.8
6/1/2021	9:00 AM	60.1	54.4	64.6	70.2	79.4	0.6
6/1/2021	10:00 AM	59.0	54.5	63.4	69.0	77.3	0.8
6/1/2021	11:00 AM	59.7	52.7	63.5	69.7	80.6	1.4
6/1/2021	11:28 AM	60.4	55.0	65.1	69.9	82.5	2.0
6/1/2021	12:00 PM	60.0	56.0	65.5	69.9	77.5	1.4
6/1/2021	1:00 PM	59.4	53.3	63.8	69.5	79.6	1.4
6/1/2021	2:00 PM	58.4	51.8	62.4	68.4	82.9	2.0
6/1/2021	3:00 PM	60.3	57.2	65.5	69.9	78.6	7.2
6/1/2021	4:00 PM	61.1	57.6	66.1	70.5	81.5	7.2
6/1/2021	5:00 PM	61.5	57.1	66.5	70.8	81.8	7.8
6/1/2021	6:00 PM	58.7	50.1	61.1	68.7	83.7	9.2
6/1/2021	7:00 PM	55.6	46.9	56.9	66.0	78.7	8.6
6/1/2021	8:00 PM	56.9	47.6	58.4	67.3	78.7	10.6
6/1/2021	9:00 PM	54.1	45.3	54.8	64.2	78.3	11.4
6/1/2021	10:00 PM	53.4	42.9	53.8	62.7	75.1	10.6
6/1/2021	11:00 PM	50.5	42.3	47.2	58.6	75.4	11.1
6/2/2021	12:00 AM	48.3	42.1	44.4	51.2	73.7	10.6
6/2/2021	1:00 AM	43.9	39.1	41.6	44.7	71.5	9.2
6/2/2021	2:00 AM	54.4	40.8	45.6	59.5	79.9	6.4
6/2/2021	3:00 AM	45.8	44.8	48.5	50.9	70.6	5.8
6/2/2021	4:00 AM	52.9	47.9	51.1	59.2	75.8	4.6
6/2/2021	5:00 AM	60.0	52.6	64.2	70.8	77.8	2.9
6/2/2021	6:00 AM	64.9	64.4	70.8	73.4	81.0	2.2
6/2/2021	7:00 AM	58.6	51.7	62.1	69.0	79.2	2.0
6/2/2021	8:00 AM	57.8	51.9	61.3	68.1	78.2	1.4
6/2/2021	9:00 AM	60.1	55.0	64.4	70.0	81.0	0.6

6/2/2021	10:00 AM	59.6	55.2	64.6	69.4	78.5	3.7
6/2/2021	11:00 AM	59.2	54.0	64.0	69.2	78.0	4.4
6/2/2021	12:00 PM	60.4	55.3	65.6	70.0	80.8	4.4
6/2/2021	1:00 PM	60.6	56.9	65.8	69.8	79.6	3.1
6/2/2021	2:00 PM	59.3	55.7	64.4	68.9	77.9	3.4
6/2/2021	3:00 PM	60.4	56.6	65.5	70.0	79.6	5.5
6/2/2021	4:00 PM	59.8	55.3	64.8	69.7	79.3	6.1
6/2/2021	5:00 PM	61.1	57.2	66.1	70.6	81.4	6.7
6/2/2021	6:00 PM	58.9	52.7	63.2	69.4	77.3	8.9
6/2/2021	7:00 PM	57.1	52.2	60.8	67.2	77.4	9.2
6/2/2021	8:00 PM	62.5	52.1	61.1	69.2	88.0	9.2
6/2/2021	9:00 PM	55.5	45.1	56.1	66.3	76.3	8.1
6/2/2021	10:00 PM	50.1	41.2	45.3	56.1	74.9	9.2
6/2/2021	11:00 PM	52.2	39.6	48.5	60.5	79.0	10.3
6/3/2021	12:00 AM	51.1	39.4	45.8	59.3	74.6	8.3
6/3/2021	1:00 AM	49.5	37.8	43.3	53.4	78.8	7.2
6/3/2021	2:00 AM	52.7	37.5	45.9	58.3	77.0	6.9
6/3/2021	3:00 AM	48.3	40.6	45.8	50.5	76.8	6.1
6/3/2021	4:00 AM	54.8	47.5	53.3	63.7	77.1	6.1
6/3/2021	5:00 AM	60.0	56.7	64.2	70.1	79.6	7.8
6/3/2021	6:00 AM	65.1	63.9	70.9	73.6	82.3	7.8
6/3/2021	7:00 AM	59.0	53.0	63.0	69.3	78.8	7.5
6/3/2021	8:00 AM	58.2	51.4	61.4	68.6	80.6	6.7
6/3/2021	9:00 AM	58.8	53.4	62.7	69.2	79.3	5.8
6/3/2021	10:00 AM	59.1	54.2	63.4	68.7	84.3	5.8
6/3/2021	11:00 AM	60.3	55.8	65.4	70.2	78.7	7.5
6/3/2021	12:00 PM	61.1	58.0	65.9	70.0	83.4	7.2
6/3/2021	1:00 PM	59.3	55.7	64.3	68.9	80.2	6.9
6/3/2021	2:00 PM	64.0	57.1	66.0	71.0	92.6	6.4
6/3/2021	3:00 PM	60.1	55.7	65.0	70.1	77.8	7.2
6/3/2021	4:00 PM	60.5	56.7	65.9	70.1	79.7	6.1
6/3/2021	5:00 PM	60.9	57.0	66.2	70.7	80.1	6.9
6/3/2021	6:00 PM	58.9	52.1	62.6	68.8	81.3	7.2
6/3/2021	7:00 PM	57.8	50.1	59.9	67.9	81.9	8.1
6/3/2021	8:00 PM	56.9	47.9	56.5	65.7	81.9	9.7
6/3/2021	9:00 PM	54.2	45.3	53.3	63.0	79.6	7.8
6/3/2021	10:00 PM	53.3	44.6	51.4	62.2	76.6	6.1
6/3/2021	11:00 PM	51.4	42.9	48.1	58.2	76.5	6.9
6/4/2021	12:00 AM	50.5	38.4	40.9	55.1	78.7	8.6
6/4/2021	1:00 AM	48.2	38.1	40.6	52.0	72.6	9.5
6/4/2021	2:00 AM	52.2	38.0	46.6	57.5	78.1	6.7
6/4/2021	3:00 AM	48.0	39.7	42.4	52.0	72.9	6.7
6/4/2021	4:00 AM	52.5	46.0	51.0	59.6	77.4	7.5
6/4/2021	5:00 AM	58.8	54.4	62.0	69.1	78.0	8.3
6/4/2021	6:00 AM	61.6	58.0	67.0	71.4	79.2	8.7
6/4/2021	7:00 AM	60.4	55.0	64.8	70.5	81.6	5.8
6/4/2021	8:00 AM	60.1	53.9	64.2	69.7	81.0	7.2
6/4/2021	9:00 AM	60.7	54.7	64.3	70.1	89.4	10.0
6/4/2021	10:00 AM	60.9	57.0	64.8	69.8	82.7	8.6
6/4/2021	11:00 AM	61.5	57.4	65.7	70.4	82.1	10.3
6/4/2021	12:00 PM	61.1	57.0	66.2	70.7	81.3	7.5
6/4/2021	1:00 PM	59.8	55.8	64.5	69.7	78.0	6.4
6/18/2021	11:18 AM	60.2	54.8	64.8	69.8	79.9	5.3
6/18/2021	12:00 PM	59.5	54.5	64.4	69.5	77.2	4.7
6/18/2021	1:00 PM	59.3	53.8	63.4	69.5	77.7	5.3
6/18/2021	2:00 PM	60.1	54.7	64.6	70.0	82.2	5.8
6/18/2021	3:00 PM	60.3	56.1	65.5	70.1	78.5	7.5
6/18/2021	4:00 PM	61.1	56.4	65.9	71.0	80.3	7.2
6/18/2021	5:00 PM	60.0	53.9	64.4	70.2	81.2	6.1
6/18/2021	6:00 PM	59.4	52.0	62.9	69.4	80.6	5.8
6/18/2021	7:00 PM	59.3	50.8	62.3	69.5	83.4	8.1
6/18/2021	8:00 PM	56.6	46.9	57.5	67.1	78.6	7.8
6/18/2021	9:00 PM	57.8	46.7	59.3	68.3	82.1	6.9
6/18/2021	10:00 PM	54.7	41.7	53.0	64.3	77.1	9.2
6/18/2021	11:00 PM	52.5	38.4	46.3	60.3	78.3	9.5
6/19/2021	12:00 AM	50.3	37.0	48.2	57.6	73.8	9.2

6/19/2021	1:00 AM	53.4	36.2	49.2	62.1	77.4	10.0
6/19/2021	2:00 AM	45.9	38.3	43.9	49.2	71.7	7.5
6/19/2021	3:00 AM	50.0	38.5	43.2	49.4	78.3	4.0
6/19/2021	4:00 AM	51.5	47.3	51.1	56.5	76.8	3.8
6/19/2021	5:00 AM	54.8	49.5	54.4	63.3	78.5	5.2
6/19/2021	6:00 AM	58.5	49.5	60.7	69.4	78.7	4.3
6/19/2021	7:00 AM	56.1	48.0	55.6	65.5	79.7	5.0
6/19/2021	8:00 AM	57.8	50.3	60.8	68.1	78.1	4.4
6/19/2021	9:00 AM	58.0	50.2	60.2	68.5	78.4	4.0
6/19/2021	10:00 AM	60.1	54.7	64.5	70.2	79.7	4.4
6/19/2021	11:00 AM	59.5	54.2	63.9	69.4	79.5	5.3
6/19/2021	12:00 PM	59.3	53.6	63.5	69.5	79.6	5.3
6/19/2021	1:00 PM	59.6	54.1	64.3	69.7	78.3	5.8
6/19/2021	2:00 PM	58.0	52.1	61.5	68.1	80.3	5.8
6/19/2021	3:00 PM	60.3	56.1	65.6	69.9	80.7	8.3
6/19/2021	4:00 PM	60.2	54.3	64.3	70.0	81.3	9.2
6/19/2021	5:00 PM	59.4	52.7	63.5	69.9	76.3	6.7
6/19/2021	6:00 PM	58.9	48.9	61.1	68.6	82.1	7.5
6/19/2021	7:00 PM	56.4	48.7	58.8	66.8	78.2	4.4
6/19/2021	8:00 PM	56.3	46.6	58.6	67.1	76.8	4.6
6/19/2021	9:00 PM	55.8	47.2	57.7	66.0	77.6	7.5
6/19/2021	10:00 PM	53.9	43.8	52.4	63.4	75.7	8.9
6/19/2021	11:00 PM	50.1	40.8	44.2	57.3	73.7	9.2
6/20/2021	12:00 AM	54.4	42.0	51.7	64.0	78.1	7.8
6/20/2021	1:00 AM	52.2	42.2	50.0	61.4	74.0	6.7
6/20/2021	2:00 AM	46.7	38.8	41.2	48.6	72.5	6.4
6/20/2021	3:00 AM	48.5	39.0	42.9	51.7	74.8	5.0
6/20/2021	4:00 AM	49.9	45.4	48.9	53.8	74.3	3.4
6/20/2021	5:00 AM	50.2	45.4	48.5	53.9	75.5	1.1
6/20/2021	6:00 AM	54.6	47.9	55.0	63.4	75.6	2.0
6/20/2021	7:00 AM	54.1	49.0	54.5	62.4	76.1	0.3
6/20/2021	8:00 AM	55.6	46.6	55.8	66.0	75.7	1.1
6/20/2021	9:00 AM	56.6	48.6	57.3	65.9	80.9	2.0
6/20/2021	10:00 AM	57.1	49.9	60.0	67.3	76.7	2.0
6/20/2021	11:00 AM	59.2	51.7	62.6	68.8	83.8	1.4
6/20/2021	12:00 PM	57.2	51.1	60.7	67.7	74.8	0.0
6/20/2021	1:00 PM	58.4	52.4	62.7	68.4	80.1	1.1
6/20/2021	2:00 PM	59.6	53.7	63.8	69.2	84.9	3.4
6/20/2021	3:00 PM	58.9	51.7	63.0	69.2	78.4	5.0
6/20/2021	4:00 PM	59.2	54.5	62.8	69.3	79.0	6.9
6/20/2021	5:00 PM	57.3	51.3	59.6	67.8	76.6	10.6
6/20/2021	6:00 PM	56.7	49.4	59.6	67.2	77.9	12.4
6/20/2021	7:00 PM	57.4	47.6	59.1	68.0	82.9	11.4
6/20/2021	8:00 PM	57.2	44.6	59.2	67.9	77.9	11.7
6/20/2021	9:00 PM	56.1	44.2	56.2	66.6	81.3	12.4
6/20/2021	10:00 PM	58.5	39.7	49.1	64.6	86.1	13.6
6/20/2021	11:00 PM	54.0	40.9	52.2	63.6	75.8	13.3
6/21/2021	12:00 AM	51.3	37.2	41.8	56.3	78.5	13.6
6/21/2021	1:00 AM	49.2	37.3	40.8	53.5	76.6	13.9
6/21/2021	2:00 AM	46.4	38.8	42.4	51.0	72.2	12.4
6/21/2021	3:00 AM	46.1	37.3	39.2	41.3	75.3	9.7
6/21/2021	4:00 AM	52.9	47.6	50.9	57.5	77.5	9.5
6/21/2021	5:00 AM	59.2	53.0	63.4	69.8	78.2	6.9
6/21/2021	6:00 AM	64.8	63.7	70.9	73.3	80.2	2.2
6/21/2021	7:00 AM	59.2	53.3	63.0	69.4	79.3	1.7
6/21/2021	8:00 AM	57.8	50.9	60.3	68.4	77.5	0.8
6/21/2021	9:00 AM	58.9	53.0	62.9	69.1	79.0	0.6
6/21/2021	10:00 AM	59.3	53.6	63.1	69.0	80.3	0.3
6/21/2021	11:00 AM	60.6	54.3	65.2	70.6	79.2	1.1
6/21/2021	12:00 PM	61.9	59.0	66.9	70.7	81.4	1.1
6/21/2021	12:17 PM	59.5	53.7	64.1	69.8	78.1	1.1
6/21/2021	1:00 PM	60.6	56.8	66.0	70.2	78.2	1.4
6/21/2021	2:00 PM	59.9	54.6	64.6	69.6	78.0	2.0
6/21/2021	3:00 PM	60.3	55.9	65.7	70.3	78.3	8.9
6/21/2021	4:00 PM	60.4	56.4	65.6	69.7	82.2	10.0
6/21/2021	5:00 PM	61.9	57.0	67.2	71.6	82.6	12.1
6/21/2021	6:00 PM	58.0	50.8	60.2	67.7	91.2	12.1

6/21/2021	7:00 PM	57.3	48.9	59.3	67.1	82.5	12.8
6/21/2021	8:00 PM	57.7	47.6	59.3	68.0	80.3	13.6
6/21/2021	9:00 PM	54.9	42.7	54.7	65.7	76.0	12.7
6/21/2021	10:00 PM	52.6	39.8	50.5	62.3	74.6	11.7
6/21/2021	11:00 PM	51.9	40.0	49.3	60.8	74.0	11.7
6/22/2021	12:00 AM	50.7	39.2	43.1	56.3	75.5	11.1
6/22/2021	1:00 AM	50.9	44.0	49.0	57.6	74.8	10.6
6/22/2021	2:00 AM	42.9	40.7	43.8	46.2	70.5	10.1
6/22/2021	3:00 AM	49.4	38.4	42.0	49.5	78.1	5.3
6/22/2021	4:00 AM	54.4	47.0	53.9	62.4	76.4	3.2
6/22/2021	5:00 AM	59.9	50.9	63.6	70.6	81.4	3.1
6/22/2021	6:00 AM	64.9	63.5	70.9	73.7	81.8	3.1
6/22/2021	7:00 AM	60.0	52.9	63.8	70.0	79.5	2.5
6/22/2021	8:00 AM	59.8	51.8	62.2	69.9	84.5	2.2
6/22/2021	9:00 AM	62.3	54.2	63.9	70.0	97.6	3.1
6/22/2021	10:00 AM	60.3	55.5	65.2	70.2	78.9	2.0
6/22/2021	11:00 AM	61.9	57.8	67.1	71.7	80.4	2.8
6/22/2021	12:00 PM	61.6	56.2	65.9	70.4	85.8	2.2
6/22/2021	1:00 PM	60.1	53.2	64.2	69.6	84.2	0.0
6/22/2021	2:00 PM	61.0	57.8	66.4	70.5	80.9	0.3
6/22/2021	3:00 PM	61.0	57.0	65.7	70.3	82.6	3.2
6/22/2021	4:00 PM	60.7	56.9	66.1	70.3	78.5	8.9
6/22/2021	5:00 PM	62.3	58.6	67.6	71.8	80.3	7.5
6/22/2021	6:00 PM	57.2	49.1	59.1	67.7	79.9	5.8
6/22/2021	7:00 PM	57.9	48.1	59.3	67.9	82.0	5.8
6/22/2021	8:00 PM	57.6	47.6	60.4	68.1	78.4	7.8
6/22/2021	9:00 PM	56.9	45.4	58.3	66.9	80.4	6.9
6/22/2021	10:00 PM	56.3	48.3	59.2	65.7	78.2	6.1
6/22/2021	11:00 PM	51.7	40.1	44.6	60.2	74.1	6.9
6/23/2021	12:00 AM	53.0	37.8	41.4	59.0	79.4	7.2
6/23/2021	1:00 AM	51.1	36.8	39.7	57.1	75.9	6.1
6/23/2021	2:00 AM	48.2	36.6	39.5	51.4	77.5	6.7
6/23/2021	3:00 AM	46.9	34.7	37.2	41.5	74.7	9.2
6/23/2021	4:00 AM	54.5	44.6	53.4	63.0	77.5	8.3
6/23/2021	5:00 AM	59.5	50.6	62.6	70.0	82.9	6.4
6/23/2021	6:00 AM	64.9	63.5	70.9	73.6	80.4	4.3
6/23/2021	7:00 AM	60.6	54.7	65.3	70.6	81.1	2.8
6/23/2021	8:00 AM	59.7	53.7	63.8	70.1	80.1	3.1
6/23/2021	9:00 AM	59.4	52.5	62.8	69.5	80.1	5.3
6/23/2021	10:00 AM	59.7	52.8	63.8	69.8	82.9	7.2
6/23/2021	11:00 AM	60.0	56.3	65.2	69.6	78.0	6.1
6/23/2021	12:00 PM	62.2	59.6	67.7	71.7	78.7	4.3
6/23/2021	1:00 PM	60.5	55.6	65.1	70.7	77.2	3.7
6/23/2021	2:00 PM	61.6	58.3	67.0	71.0	83.5	2.5
6/23/2021	3:00 PM	61.4	57.0	66.7	70.9	82.8	3.4
6/23/2021	4:00 PM	61.3	58.0	66.6	70.8	81.7	5.3
6/23/2021	5:00 PM	62.1	58.1	67.8	71.9	79.4	3.4
6/23/2021	6:00 PM	59.4	51.9	62.9	69.3	85.7	4.0
6/23/2021	7:00 PM	58.7	51.8	62.2	69.1	80.5	6.4
6/23/2021	8:00 PM	58.6	46.9	59.3	67.9	84.5	5.8
6/23/2021	9:00 PM	56.0	46.6	58.1	66.4	76.5	4.4
6/23/2021	10:00 PM	55.0	39.7	55.7	65.3	79.0	8.9
6/23/2021	11:00 PM	52.8	39.1	51.1	62.5	76.2	8.9
6/24/2021	12:00 AM	52.2	38.3	42.1	59.3	79.6	6.9
6/24/2021	1:00 AM	49.2	38.1	40.4	55.4	73.0	5.5
6/24/2021	2:00 AM	47.9	35.7	39.2	54.7	73.2	6.7
6/24/2021	3:00 AM	45.8	36.9	38.2	41.0	74.6	4.4
6/24/2021	4:00 AM	53.7	43.8	50.1	61.8	76.4	3.1
6/24/2021	5:00 AM	59.2	52.5	62.7	70.3	78.8	2.5
6/24/2021	6:00 AM	65.1	64.4	71.3	73.7	79.6	2.5
6/24/2021	7:00 AM	59.8	53.2	63.8	70.1	80.6	3.4
6/24/2021	8:00 AM	58.9	52.7	62.3	69.2	79.0	4.4
6/24/2021	9:00 AM	60.6	55.1	65.2	70.4	78.9	4.6
6/24/2021	10:00 AM	61.5	55.7	65.9	71.4	81.7	3.1
6/24/2021	11:00 AM	62.7	58.7	67.5	72.0	81.5	2.0
6/24/2021	12:00 PM	62.4	59.4	67.9	71.3	82.4	3.1
6/24/2021	1:00 PM	61.3	57.0	65.9	70.8	83.4	3.5

6/24/2021	2:00 PM	61.9	57.5	66.7	71.5	80.2	3.4
6/24/2021	3:00 PM	61.6	58.1	66.7	70.9	81.2	2.5
6/24/2021	4:00 PM	61.6	57.9	66.7	71.1	83.4	3.7
6/24/2021	5:00 PM	61.8	58.4	67.1	71.2	81.3	3.1
6/24/2021	6:00 PM	58.8	49.5	61.9	69.0	81.6	4.6
6/24/2021	7:00 PM	57.4	47.3	58.9	67.5	79.5	6.7
6/24/2021	8:00 PM	58.7	48.5	61.3	69.1	80.7	9.5
6/24/2021	9:00 PM	56.2	45.3	58.2	66.9	78.2	11.1
6/24/2021	10:00 PM	54.1	40.3	53.1	63.7	77.5	11.5
6/24/2021	11:00 PM	52.9	40.6	50.4	60.9	76.4	8.6
6/25/2021	12:00 AM	49.9	40.3	43.6	55.7	73.5	6.7
6/25/2021	1:00 AM	50.3	41.5	44.2	54.0	76.0	6.4
6/25/2021	2:00 AM	39.5	40.1	42.4	44.8	62.6	4.9
6/25/2021	3:00 AM	48.2	37.2	40.3	48.1	74.2	2.2
6/25/2021	4:00 AM	52.2	45.9	51.7	57.6	74.6	1.1
6/25/2021	5:00 AM	58.2	47.3	58.9	68.3	81.5	0.8
6/25/2021	6:00 AM	59.8	52.9	63.8	70.2	79.8	0.6
6/25/2021	7:00 AM	60.4	53.8	64.7	70.1	81.5	1.1
6/25/2021	8:00 AM	58.2	51.5	61.5	69.0	76.1	1.1
6/25/2021	9:00 AM	61.0	54.2	64.3	70.4	83.5	0.8
6/25/2021	10:00 AM	61.1	57.2	65.7	70.4	81.2	2.2
6/25/2021	11:00 AM	62.0	56.5	66.1	70.8	86.4	0.6
7/2/2021	10:17 AM	58.6	54.8	63.5	68.2	83.4	3.1
7/2/2021	11:00 AM	61.2	57.7	66.7	71.0	78.0	2.8
7/2/2021	12:00 PM	60.5	56.3	65.6	70.2	78.6	4.4
7/2/2021	1:00 PM	61.7	58.3	67.5	71.1	79.8	1.1
7/2/2021	2:00 PM	61.9	58.4	67.5	71.2	80.7	2.0
7/2/2021	3:00 PM	61.4	58.0	66.8	70.8	80.7	0.0
7/2/2021	4:00 PM	61.0	57.5	66.9	70.6	77.3	0.6
7/2/2021	5:00 PM	61.2	57.5	66.8	71.0	80.4	4.0
7/2/2021	6:00 PM	59.7	53.8	64.3	70.0	77.9	7.8
7/2/2021	7:00 PM	58.5	49.3	61.0	69.0	83.0	7.2
7/2/2021	8:00 PM	59.1	48.8	61.9	69.5	82.0	7.5
7/2/2021	9:00 PM	57.5	51.4	61.7	68.1	79.8	6.7
7/2/2021	10:00 PM	52.8	39.0	49.6	61.6	81.3	8.3
7/2/2021	11:00 PM	58.3	40.5	56.7	66.9	87.6	8.1
7/3/2021	12:00 AM	59.5	43.0	55.5	64.8	100.5	4.9
7/3/2021	1:00 AM	53.2	37.9	49.4	62.0	75.9	7.2
7/3/2021	2:00 AM	46.5	37.2	38.9	43.3	73.2	3.7
7/3/2021	3:00 AM	45.5	36.3	37.2	39.3	72.3	3.7
7/3/2021	4:00 AM	49.1	41.5	44.4	54.5	73.4	1.7
7/3/2021	5:00 AM	53.3	45.9	50.8	61.4	77.6	0.6
7/3/2021	6:00 AM	55.6	46.3	54.9	65.0	77.7	2.8
7/3/2021	7:00 AM	56.8	46.5	58.1	67.0	81.1	1.7
7/3/2021	8:00 AM	58.1	50.1	61.4	68.7	76.6	3.4
7/3/2021	9:00 AM	58.9	50.5	62.7	69.7	78.8	2.2
7/3/2021	10:00 AM	59.7	53.5	64.2	70.1	78.3	0.0
7/3/2021	11:00 AM	59.8	54.0	64.5	69.8	80.1	1.1
7/3/2021	12:00 PM	60.5	55.2	65.4	70.2	81.4	1.1
7/3/2021	1:00 PM	59.6	55.3	64.9	69.5	76.7	1.1
7/3/2021	2:00 PM	60.7	56.1	65.9	70.5	81.9	2.8
7/3/2021	3:00 PM	60.8	57.7	66.4	70.4	76.9	2.5
7/3/2021	4:00 PM	61.4	58.2	67.0	71.0	80.0	4.9
7/3/2021	5:00 PM	60.2	55.8	65.4	69.7	81.4	9.2
7/3/2021	6:00 PM	59.2	53.1	63.8	69.7	79.9	12.1
7/3/2021	7:00 PM	60.3	48.9	62.3	69.1	91.4	11.5
7/3/2021	8:00 PM	59.1	54.0	63.6	69.4	78.0	12.1
7/3/2021	9:00 PM	59.4	52.2	63.1	69.3	82.3	10.0
7/3/2021	10:00 PM	56.9	46.5	59.0	67.4	81.6	9.2
7/3/2021	11:00 PM	56.0	39.7	56.9	66.2	77.4	8.9
7/4/2021	12:00 AM	54.3	38.3	52.6	64.5	79.5	9.2
7/4/2021	1:00 AM	52.6	37.3	44.7	60.9	88.3	8.3
7/4/2021	2:00 AM	44.7	37.0	39.6	50.6	72.1	6.4
7/4/2021	3:00 AM	47.2	35.1	36.4	38.6	75.1	3.5
7/4/2021	4:00 AM	49.0	38.6	43.2	54.2	73.9	2.0
7/4/2021	5:00 AM	50.1	41.0	47.5	55.8	75.8	3.1
7/4/2021	6:00 AM	53.8	39.4	52.9	64.0	75.9	3.4

7/4/2021	7:00 AM	56.4	47.2	57.2	66.5	76.7	3.4
7/4/2021	8:00 AM	57.2	46.1	59.1	67.9	77.6	3.4
7/4/2021	9:00 AM	58.2	50.0	61.3	68.9	77.4	3.7
7/4/2021	10:00 AM	58.4	49.4	61.8	69.0	78.5	3.4
7/4/2021	11:00 AM	59.5	54.2	64.3	69.6	78.4	2.3
7/4/2021	12:00 PM	61.1	57.6	66.6	70.9	77.7	2.5
7/4/2021	1:00 PM	59.9	55.7	65.3	69.6	78.5	2.6
7/4/2021	2:00 PM	61.1	57.1	66.4	70.7	83.0	5.5
7/4/2021	3:00 PM	61.9	56.1	65.9	70.2	91.5	6.1
7/4/2021	4:00 PM	60.7	55.3	65.5	70.6	82.8	5.8
7/4/2021	5:00 PM	60.9	55.7	65.6	70.4	84.7	6.9
7/4/2021	6:00 PM	58.2	51.6	62.5	68.6	77.3	6.4
7/4/2021	7:00 PM	60.5	51.3	62.8	69.3	98.6	5.5
7/4/2021	8:00 PM	61.3	54.0	65.0	70.5	94.2	7.5
7/4/2021	9:00 PM	62.4	56.6	65.9	70.6	95.1	8.1
7/4/2021	10:00 PM	66.4	62.5	69.6	73.7	94.7	7.5
7/4/2021	11:00 PM	62.1	51.1	62.5	69.0	93.3	7.8
7/5/2021	12:00 AM	78.7	39.7	57.5	64.8	121.5	6.9
7/5/2021	1:00 AM	52.2	36.0	44.9	61.3	76.0	11.0
7/5/2021	2:00 AM	44.8	35.7	42.4	52.0	70.6	9.2
7/5/2021	3:00 AM	49.6	37.1	41.8	53.8	76.6	6.3
7/5/2021	4:00 AM	45.7	39.4	43.4	51.1	72.1	5.8
7/5/2021	5:00 AM	49.6	43.1	48.8	55.6	75.0	4.3
7/5/2021	6:00 AM	52.9	42.7	53.5	61.8	75.1	6.7
7/5/2021	7:00 AM	55.9	41.9	54.6	64.9	78.7	3.7
7/5/2021	8:00 AM	58.2	44.1	57.2	67.3	84.3	3.1
7/5/2021	9:00 AM	56.8	43.7	58.0	66.9	79.6	3.1
7/5/2021	10:00 AM	58.0	47.9	60.8	68.6	80.9	4.4
7/5/2021	11:00 AM	59.1	53.1	63.3	69.3	79.1	5.8
7/5/2021	12:00 PM	57.5	49.3	60.2	67.5	85.1	5.3
7/5/2021	1:03 PM	59.6	52.7	63.3	69.4	82.4	3.4
7/5/2021	2:00 PM	58.6	52.9	62.9	68.8	78.5	4.4
7/5/2021	3:00 PM	59.6	55.1	64.9	69.4	79.3	2.2
7/5/2021	4:00 PM	60.0	55.3	65.2	70.0	79.1	3.4
7/5/2021	5:00 PM	58.4	51.7	62.5	68.9	84.6	5.3
7/5/2021	6:00 PM	56.8	47.5	59.5	67.5	79.4	6.1
7/5/2021	7:00 PM	56.2	44.5	58.3	66.9	78.3	5.5
7/5/2021	8:00 PM	57.7	46.8	59.8	68.5	81.4	7.2
7/5/2021	9:00 PM	55.4	44.2	55.9	65.7	75.6	8.6
7/5/2021	10:00 PM	52.7	38.2	51.9	63.0	73.6	6.9
7/5/2021	11:00 PM	50.9	36.1	44.9	58.8	74.5	8.9
7/6/2021	12:00 AM	53.0	37.9	45.9	59.9	80.8	7.2
7/6/2021	1:00 AM	52.6	38.5	42.0	59.6	80.6	9.2
7/6/2021	2:00 AM	42.7	38.7	41.1	50.2	66.8	9.5
7/6/2021	3:00 AM	48.8	36.5	38.0	51.0	74.1	4.6
7/6/2021	4:00 AM	51.5	39.2	43.5	56.9	75.8	3.4
7/6/2021	5:00 AM	59.6	50.7	63.3	69.9	83.5	2.5
7/6/2021	6:00 AM	64.4	62.9	70.6	73.5	78.3	3.5
7/6/2021	7:00 AM	59.9	53.5	64.6	69.9	80.3	2.5
7/6/2021	8:00 AM	58.4	49.4	61.9	68.8	78.9	1.7
7/6/2021	9:00 AM	59.4	50.6	63.2	69.8	79.0	0.8
7/6/2021	10:00 AM	59.9	54.6	64.8	70.1	78.9	0.8
7/6/2021	11:00 AM	62.1	55.5	65.5	70.5	90.7	2.9
7/6/2021	12:00 PM	60.6	56.2	65.9	70.4	80.4	2.5
7/6/2021	1:00 PM	59.7	54.0	64.6	69.6	79.5	2.2
7/6/2021	2:00 PM	60.6	57.0	65.7	70.2	79.9	2.0
7/6/2021	3:00 PM	61.1	57.6	66.4	70.6	79.7	3.7
7/6/2021	4:00 PM	61.3	57.9	66.6	70.9	79.8	2.9
7/6/2021	5:00 PM	61.5	57.3	66.9	71.2	79.9	2.2
7/6/2021	6:00 PM	57.4	46.9	59.5	67.7	78.2	3.4
7/6/2021	7:00 PM	55.9	44.9	57.9	66.6	76.1	4.0
7/6/2021	8:00 PM	55.7	45.0	57.3	66.3	78.3	7.8
7/6/2021	9:00 PM	56.2	43.0	57.1	66.4	79.3	8.1
7/6/2021	10:00 PM	51.7	40.0	48.6	60.8	77.6	7.2
7/6/2021	11:00 PM	50.8	38.4	41.5	57.3	75.2	8.1
7/7/2021	12:00 AM	50.8	38.6	43.0	59.1	73.8	7.2
7/7/2021	1:00 AM	51.4	40.2	43.9	57.5	76.2	6.7

7/7/2021	2:00 AM	47.1	36.0	37.3	44.0	74.3	4.9
7/7/2021	3:00 AM	45.1	37.6	39.1	41.2	74.2	3.1
7/7/2021	4:00 AM	52.7	40.5	45.7	60.1	76.7	2.8
7/7/2021	5:00 AM	58.9	50.6	63.1	69.6	77.2	4.6
7/7/2021	6:00 AM	64.9	64.1	70.8	73.4	83.6	4.4
7/7/2021	7:00 AM	59.9	53.9	64.4	70.1	79.2	4.4
7/7/2021	8:00 AM	58.3	49.6	60.7	68.4	81.8	5.0
7/7/2021	9:00 AM	58.7	51.9	62.6	69.2	77.9	2.5
7/7/2021	10:00 AM	60.4	54.9	65.0	70.3	79.7	2.9
7/7/2021	11:00 AM	61.2	57.5	66.4	71.0	80.3	6.4
7/7/2021	12:00 PM	63.3	58.9	67.6	72.1	83.2	4.4
7/7/2021	1:00 PM	62.5	58.6	67.7	72.1	80.7	5.0
7/7/2021	2:00 PM	60.8	57.2	66.0	70.4	80.1	5.5
7/7/2021	3:00 PM	61.3	58.1	66.5	71.0	79.7	4.6
7/7/2021	4:00 PM	61.8	59.3	67.4	71.2	79.9	4.9
7/7/2021	5:00 PM	62.4	59.1	67.7	71.9	81.7	10.1
7/7/2021	6:00 PM	57.7	50.1	61.5	68.3	77.4	13.0
7/7/2021	7:00 PM	56.8	44.2	57.8	67.5	79.6	13.0
7/7/2021	8:00 PM	55.9	45.1	57.6	66.5	76.5	13.3
7/7/2021	9:00 PM	55.3	40.8	56.6	66.1	77.2	13.0
7/7/2021	10:00 PM	54.4	38.1	52.6	63.3	81.0	12.4
7/7/2021	11:00 PM	51.5	35.7	42.3	58.8	76.3	10.0
7/8/2021	12:00 AM	50.3	36.3	40.5	57.5	73.6	10.0
7/8/2021	1:00 AM	49.7	36.1	39.1	55.5	75.2	10.0
7/8/2021	2:00 AM	45.9	35.9	38.4	44.0	72.8	8.9
7/8/2021	3:00 AM	49.6	38.4	44.5	55.1	74.8	4.6
7/8/2021	4:00 AM	51.6	38.3	43.0	56.8	76.2	3.7
7/8/2021	5:00 AM	58.8	48.5	62.8	69.9	77.1	4.0
7/8/2021	6:00 AM	64.9	63.9	70.8	73.6	85.5	3.1
7/8/2021	7:00 AM	59.1	51.7	63.3	69.5	79.7	3.4
7/8/2021	8:00 AM	58.6	49.5	61.2	69.0	79.1	3.4
7/8/2021	9:00 AM	59.3	51.4	62.9	69.5	80.5	2.8
7/8/2021	10:00 AM	59.9	53.8	64.6	70.1	79.0	3.4
7/8/2021	11:00 AM	61.2	57.3	66.1	70.6	80.2	2.8
7/8/2021	12:00 PM	60.4	55.6	65.3	70.3	82.3	2.0
7/8/2021	1:00 PM	60.7	54.6	65.0	70.3	82.3	2.2
7/8/2021	2:00 PM	60.3	56.8	64.7	69.6	80.3	1.1
7/8/2021	3:00 PM	60.5	56.3	66.2	70.2	79.3	1.1
7/8/2021	4:00 PM	60.9	56.8	66.0	70.6	80.4	1.7
7/8/2021	5:00 PM	62.1	58.7	67.2	71.6	81.5	4.0
7/8/2021	6:00 PM	58.6	51.1	62.2	69.2	77.7	5.2
7/8/2021	7:00 PM	56.7	44.6	58.3	66.9	78.1	7.2
7/8/2021	8:00 PM	57.8	50.4	61.2	68.5	76.7	5.8
7/8/2021	9:00 PM	55.5	40.8	56.6	66.4	75.8	2.8
7/8/2021	10:00 PM	52.3	36.9	50.4	62.0	73.4	7.5
7/8/2021	11:00 PM	51.6	35.5	39.7	59.0	75.3	8.3
7/9/2021	12:00 AM	53.7	34.9	48.1	62.3	75.9	5.8
7/9/2021	1:00 AM	49.3	33.0	36.1	54.8	75.9	7.8
7/9/2021	2:00 AM	48.2	34.1	38.0	51.1	79.7	8.3
7/9/2021	3:00 AM	49.6	34.0	36.8	55.3	77.4	5.2
7/9/2021	4:00 AM	51.6	37.2	41.6	57.0	78.2	2.5
7/9/2021	5:00 AM	57.5	43.8	60.1	68.3	77.2	3.4
7/9/2021	6:00 AM	60.8	55.4	66.0	71.2	78.2	4.3
7/9/2021	7:00 AM	59.0	50.1	62.2	69.3	79.4	4.4
7/9/2021	8:00 AM	58.1	47.1	60.6	68.5	80.0	6.4
7/9/2021	9:00 AM	58.7	49.3	61.8	69.2	77.9	2.5
7/9/2021	10:00 AM	60.4	55.0	65.3	70.5	78.0	2.6
7/9/2021	11:00 AM	60.4	56.1	65.3	70.4	82.6	2.8
7/9/2021	12:00 PM	60.9	55.7	66.0	70.7	79.8	4.9
7/23/2021	10:05 AM	60.1	55.2	64.9	69.9	81.6	N/A
7/23/2021	11:00 AM	59.9	53.6	64.4	70.1	80.1	N/A
7/23/2021	12:00 PM	60.7	56.9	66.0	70.5	79.4	N/A
7/23/2021	1:00 PM	60.0	55.5	65.2	70.1	77.9	N/A
7/23/2021	2:00 PM	59.9	54.4	64.2	69.8	84.3	N/A
7/23/2021	3:00 PM	60.8	57.3	66.1	70.3	83.0	4.4
7/23/2021	4:00 PM	61.3	56.5	66.3	71.2	80.3	5.2

7/23/2021	5:00 PM	60.2	55.1	65.2	70.5	78.3	4.0
7/23/2021	6:00 PM	56.1	46.4	58.6	66.4	77.7	3.4
7/23/2021	7:00 PM	56.1	44.0	57.7	66.5	76.7	5.1
7/23/2021	8:00 PM	55.5	46.2	57.1	66.3	75.5	7.8
7/23/2021	9:00 PM	56.9	42.0	56.9	66.8	82.0	9.5
7/23/2021	10:00 PM	54.0	41.5	53.2	64.2	76.3	9.2
7/23/2021	11:00 PM	52.1	40.8	45.0	59.6	76.7	6.9
7/24/2021	12:00 AM	52.5	39.9	51.5	60.3	76.3	6.7
7/24/2021	1:00 AM	52.5	39.9	44.7	59.6	79.4	7.5
7/24/2021	2:00 AM	51.7	37.1	40.2	53.0	80.9	4.0
7/24/2021	3:00 AM	47.8	35.4	36.8	39.9	77.3	2.8
7/24/2021	4:00 AM	50.9	37.4	40.0	52.3	79.0	0.8
7/24/2021	5:00 AM	51.7	44.7	48.0	56.4	77.4	0.8
7/24/2021	6:00 AM	54.0	42.8	48.7	62.3	76.2	2.0
7/24/2021	7:00 AM	53.4	43.2	52.2	63.0	75.7	2.0
7/24/2021	8:00 AM	57.5	43.4	56.8	66.2	90.7	3.1
7/24/2021	9:00 AM	59.1	53.9	63.4	69.0	78.4	2.5
7/24/2021	10:00 AM	58.7	51.2	62.8	69.2	78.6	2.2
7/24/2021	11:00 AM	59.4	54.2	64.1	69.7	76.8	2.5
7/24/2021	12:00 PM	58.3	52.3	62.9	68.4	78.7	3.1
7/24/2021	1:00 PM	58.4	53.6	63.2	68.7	75.0	3.4
7/24/2021	2:00 PM	58.1	49.3	61.7	68.7	78.8	4.0
7/24/2021	3:00 PM	58.7	52.7	63.0	69.0	77.9	4.0
7/24/2021	4:00 PM	58.4	50.3	61.9	68.5	80.0	1.7
7/24/2021	5:00 PM	58.8	53.6	63.2	69.3	76.0	3.4
7/24/2021	6:00 PM	56.6	44.2	58.3	67.2	76.2	6.4
7/24/2021	7:00 PM	57.5	47.2	60.6	67.9	77.4	7.2
7/24/2021	8:00 PM	57.3	47.8	60.5	68.1	76.5	10.8
7/24/2021	9:00 PM	55.1	41.6	55.8	65.4	76.2	9.7
7/24/2021	10:00 PM	53.6	39.3	50.6	63.6	76.6	10.0
7/24/2021	11:00 PM	52.3	39.0	43.0	59.9	75.3	6.7
7/25/2021	12:00 AM	50.2	38.8	41.9	57.4	75.5	9.7
7/25/2021	1:00 AM	51.0	37.3	41.4	58.5	74.0	8.3
7/25/2021	2:00 AM	46.9	36.4	41.5	54.8	72.8	4.3
7/25/2021	3:00 AM	39.1	34.3	36.1	39.2	67.1	3.1
7/25/2021	4:00 AM	50.8	39.8	44.4	56.8	75.1	2.8
7/25/2021	5:00 AM	52.7	42.0	46.3	59.5	81.0	3.4
7/25/2021	6:00 AM	48.1	40.7	43.7	50.8	74.0	4.9
7/25/2021	7:00 AM	53.8	40.5	53.0	63.3	75.6	4.7
7/25/2021	8:00 AM	52.5	41.1	50.4	62.1	75.3	6.4
7/25/2021	9:00 AM	57.0	45.8	59.5	67.6	76.9	5.8
7/25/2021	10:00 AM	57.6	44.2	59.5	68.0	83.5	6.1
7/25/2021	11:00 AM	56.8	44.1	59.0	67.4	77.1	5.8
7/25/2021	12:00 PM	59.5	50.2	62.3	70.0	80.7	5.3
7/25/2021	1:00 PM	58.6	53.1	63.6	68.9	76.1	5.0
7/25/2021	2:00 PM	59.1	51.5	63.0	69.1	82.9	6.1
7/25/2021	3:00 PM	58.0	51.7	62.2	68.5	77.4	7.2
7/25/2021	4:00 PM	57.8	50.8	61.7	68.2	79.5	6.1
7/25/2021	5:00 PM	57.8	49.3	60.7	68.1	76.1	9.5
7/25/2021	6:00 PM	55.2	44.1	56.6	65.5	75.5	8.9
7/25/2021	7:00 PM	56.4	44.2	57.9	67.1	76.0	8.1
7/25/2021	8:00 PM	56.7	45.0	58.7	67.4	77.7	6.7
7/25/2021	9:00 PM	53.8	42.1	54.5	64.4	74.6	7.2
7/25/2021	10:00 PM	53.2	39.6	49.9	62.4	75.5	9.5
7/25/2021	11:00 PM	51.1	39.4	42.8	58.0	76.3	8.1
7/26/2021	12:00 AM	47.2	37.3	39.4	50.9	72.5	6.1
7/26/2021	1:00 AM	48.5	35.6	39.0	54.4	72.5	8.3
7/26/2021	2:00 AM	47.0	35.9	41.2	50.9	74.6	7.5
7/26/2021	3:00 AM	36.3	36.8	39.7	42.2	52.7	8.9
7/26/2021	4:00 AM	51.4	41.3	45.0	58.5	75.7	8.9
7/26/2021	5:00 AM	58.7	46.0	61.3	69.3	84.1	5.8
7/26/2021	6:00 AM	65.3	64.5	71.2	73.9	81.6	5.8
7/26/2021	7:00 AM	59.9	51.7	63.8	70.2	81.0	7.2
7/26/2021	8:00 AM	59.2	53.6	63.6	69.5	78.4	6.9
7/26/2021	9:00 AM	58.5	52.1	62.5	68.9	77.2	6.4
7/26/2021	10:00 AM	60.0	52.1	62.8	69.5	85.3	5.8
7/26/2021	11:00 AM	59.3	53.5	64.1	69.6	76.6	5.8

7/26/2021	12:00 PM	60.3	55.6	65.4	69.7	82.8	6.1
7/26/2021	12:37 PM	59.4	51.2	63.5	69.8	84.1	6.1
7/26/2021	1:00 PM	60.6	55.8	65.2	70.3	80.8	5.8
7/26/2021	2:00 PM	60.1	54.1	64.3	69.8	79.9	6.9
7/26/2021	3:00 PM	59.7	54.8	64.6	69.8	77.7	6.7
7/26/2021	4:00 PM	60.3	54.6	64.7	70.4	84.7	6.1
7/26/2021	5:00 PM	60.1	55.1	65.0	70.2	81.3	5.5
7/26/2021	6:00 PM	57.8	50.2	61.7	68.2	79.4	4.7
7/26/2021	7:00 PM	56.3	42.1	56.9	66.7	77.6	6.1
7/26/2021	8:00 PM	58.6	44.9	60.0	68.9	80.3	5.5
7/26/2021	9:00 PM	54.6	40.5	55.2	64.9	75.2	6.9
7/26/2021	10:00 PM	52.9	37.8	44.9	60.6	81.4	7.5
7/26/2021	11:00 PM	51.6	37.8	40.4	53.1	80.4	8.9
7/27/2021	12:00 AM	48.0	36.6	37.8	50.9	73.3	4.9
7/27/2021	1:00 AM	48.1	35.2	37.4	51.9	77.2	4.6
7/27/2021	2:00 AM	48.0	36.0	43.1	51.9	76.1	6.9
7/27/2021	3:00 AM	42.2	36.1	38.9	42.0	71.8	4.4
7/27/2021	4:00 AM	53.5	37.1	41.9	61.5	78.0	5.5
7/27/2021	5:00 AM	58.1	46.6	61.6	68.8	80.9	4.9
7/27/2021	6:00 AM	65.2	64.7	71.1	73.5	85.5	5.0
7/27/2021	7:00 AM	60.3	54.1	64.6	70.3	80.3	4.9
7/27/2021	8:00 AM	59.5	52.8	63.4	69.8	80.7	5.3
7/27/2021	9:00 AM	59.6	53.4	63.8	69.8	81.6	6.4
7/27/2021	10:00 AM	59.3	51.9	63.0	69.2	82.0	4.7
7/27/2021	11:00 AM	60.9	56.3	66.4	71.1	77.9	3.7
7/27/2021	12:00 PM	58.5	53.2	63.1	68.9	77.1	3.1
7/27/2021	1:00 PM	61.2	56.5	65.7	70.2	84.3	3.1
7/27/2021	2:00 PM	60.7	55.3	65.7	70.3	80.3	1.7
7/27/2021	3:00 PM	61.8	58.4	67.0	70.7	84.3	5.5
7/27/2021	4:00 PM	60.6	56.4	65.6	70.2	82.9	3.7
7/27/2021	5:00 PM	61.1	57.3	66.4	70.8	78.8	6.3
7/27/2021	6:00 PM	56.2	42.5	57.7	67.1	76.3	8.6
7/27/2021	7:00 PM	57.1	43.1	58.9	67.3	80.4	9.2
7/27/2021	8:00 PM	55.8	45.1	57.8	66.5	76.8	8.3
7/27/2021	9:00 PM	54.8	43.5	56.3	65.2	77.3	8.9
7/27/2021	10:00 PM	50.3	40.6	44.6	56.8	77.0	8.6
7/27/2021	11:00 PM	51.6	38.5	41.9	58.0	77.7	6.7
7/28/2021	12:00 AM	50.4	39.4	41.9	55.0	76.5	6.4
7/28/2021	1:00 AM	49.8	39.4	42.4	50.8	77.5	5.8
7/28/2021	2:00 AM	47.3	38.9	43.0	52.5	73.6	4.4
7/28/2021	3:00 AM	44.7	40.4	42.9	45.5	71.0	3.7
7/28/2021	4:00 AM	53.0	43.0	46.5	60.6	79.1	4.0
7/28/2021	5:00 AM	58.8	49.4	62.5	69.8	76.6	5.5
7/28/2021	6:00 AM	65.8	65.5	71.6	74.1	81.1	4.7
7/28/2021	7:00 AM	59.7	51.6	63.2	70.0	81.2	4.4
7/28/2021	8:00 AM	57.6	48.5	60.5	68.0	79.3	3.7
7/28/2021	9:00 AM	58.7	52.6	62.7	68.9	78.0	4.0
7/28/2021	10:00 AM	61.0	56.5	65.7	70.3	83.7	4.0
7/28/2021	11:00 AM	59.8	54.8	64.9	69.9	78.0	2.8
7/28/2021	12:00 PM	60.1	54.2	64.8	69.6	84.5	1.4
7/28/2021	1:00 PM	59.9	54.9	65.1	69.7	79.8	2.5
7/28/2021	2:00 PM	59.6	54.4	64.9	69.8	76.1	2.5
7/28/2021	3:00 PM	61.6	57.5	66.7	70.8	86.2	3.7
7/28/2021	4:00 PM	61.3	57.1	66.4	70.8	82.3	4.0
7/28/2021	5:00 PM	62.0	56.7	66.9	71.5	84.8	7.2
7/28/2021	6:00 PM	58.6	47.1	60.4	68.4	80.3	7.2
7/28/2021	7:00 PM	61.0	47.6	60.3	68.4	90.1	10.0
7/28/2021	8:00 PM	56.5	43.5	58.5	67.1	77.8	9.5
7/28/2021	9:00 PM	54.9	40.3	53.3	64.9	78.1	8.6
7/28/2021	10:00 PM	55.4	40.3	54.4	64.4	83.2	7.5
7/28/2021	11:00 PM	48.0	37.8	39.5	53.3	73.0	7.5
7/29/2021	12:00 AM	50.7	37.5	40.6	57.1	76.3	8.1
7/29/2021	1:00 AM	50.3	39.7	43.0	56.2	77.5	6.7
7/29/2021	2:00 AM	44.0	38.6	42.2	46.3	71.1	3.7
7/29/2021	3:00 AM	47.1	41.8	45.3	50.1	73.7	4.6
7/29/2021	4:00 AM	52.7	45.1	48.3	58.7	77.3	4.7
7/29/2021	5:00 AM	67.1	51.0	62.7	69.9	101.1	5.5

7/29/2021	6:00 AM	65.4	64.7	71.4	73.7	85.6	5.0
7/29/2021	7:00 AM	59.8	53.5	64.0	70.0	79.0	5.0
7/29/2021	8:00 AM	59.1	52.5	62.5	69.5	81.7	3.7
7/29/2021	9:00 AM	58.5	49.2	62.1	69.1	76.9	5.0
7/29/2021	10:00 AM	59.4	52.9	63.5	69.4	79.0	3.7
7/29/2021	11:00 AM	60.0	54.4	64.5	70.1	79.9	2.2
7/29/2021	12:00 PM	60.8	54.6	65.5	70.0	83.2	0.0
7/29/2021	1:00 PM	59.8	54.6	64.8	69.7	79.9	0.6
7/29/2021	2:00 PM	60.2	54.8	64.9	70.3	78.4	3.4
7/29/2021	3:00 PM	61.1	57.1	66.3	70.7	82.8	4.0
7/29/2021	4:00 PM	61.9	57.6	66.8	71.2	84.9	4.3
7/29/2021	5:00 PM	59.7	54.1	63.9	70.0	80.1	6.1
7/29/2021	6:00 PM	57.6	49.4	60.6	68.2	77.1	7.8
7/29/2021	7:00 PM	58.5	50.0	61.4	69.0	78.2	9.2
7/29/2021	8:00 PM	56.8	48.5	59.7	67.3	77.0	10.0
7/29/2021	9:00 PM	56.1	43.5	58.6	66.8	77.2	10.0
7/29/2021	10:00 PM	49.6	40.3	48.0	58.2	72.3	9.5
7/29/2021	11:00 PM	51.5	40.5	45.3	59.8	75.2	7.8
7/30/2021	12:00 AM	50.4	39.1	41.0	51.9	78.5	7.2
7/30/2021	1:00 AM	50.0	38.4	41.9	53.6	75.0	4.0
7/30/2021	2:00 AM	43.6	37.1	38.4	43.0	71.2	3.1
7/30/2021	3:00 AM	46.0	38.3	41.7	54.0	73.2	3.4
7/30/2021	4:00 AM	54.3	44.2	50.8	62.9	77.4	3.4
7/30/2021	5:00 AM	56.1	45.1	55.3	65.8	78.8	4.0
7/30/2021	6:00 AM	60.4	55.3	65.3	70.7	76.7	3.4
7/30/2021	7:00 AM	59.4	52.7	63.6	69.5	78.9	3.1
7/30/2021	8:00 AM	59.6	53.3	63.8	69.7	81.1	3.7
7/30/2021	9:00 AM	59.9	53.8	64.3	69.9	79.0	3.4
7/30/2021	10:00 AM	59.6	54.2	64.3	69.4	82.9	3.4
7/30/2021	11:00 AM	60.4	56.6	66.0	70.2	80.1	1.7

Notes

1. $L_{2.5}$ = Level exceeded 2.5% (1.5 minutes) per hour
   $L_{8.3}$ = Level exceeded 8.3% (5 minutes) per hour
   L_{25} = Level exceeded 25% (15 minutes) per hour
   L_{max} = Maximum noise level measured (including impulsive noise)

Abbreviations

dBA = A-weighted decibels

mph = miles per hour

Appendix D

2021 Great Blue Heron Existing Conditions Biological Monitoring Summary and Data Tables

Appendix D – 2021 Great Blue Heron Existing Conditions Biological Monitoring Summary and Data Tables

D.1 Biological Monitoring Summary

The purpose of the great blue heron (*Ardea herodias*) existing conditions biological monitoring was to characterize heron behavior in their ambient noise environment. The pre-project monitoring occurred between April and July 2021 to establish baseline conditions that could be used to determine whether increased response to disturbance would occur due to upcoming planned construction activities at the Whitmarsh Landfill.

Biological monitoring consisted of recording observations of noise and visual events and heron behavior over six monitoring periods:

- Monitoring Period 1: April 9 to April 15
- Monitoring Period 2: April 29 to May 7
- Monitoring Period 3: May 28 to June 4
- Monitoring Period 4: June 18 to June 25
- Monitoring Period 5: July 2 to July 9
- Monitoring Period 6: July 23 to July 30

Each monitoring period occurred over a block of time during two different days. Observed behaviors were noted, along with the time of day and correlating noise or activity assumed to have elicited the observed behavior. The correlation of observed behavior to a particular noise event or activity was primarily assumed, as birds may vocalize, flush, or circle the heronry for a variety of reasons, including as a response to predators, other herons, weather, or to noises or activities that were not heard, seen, or noted by the observers on-site. Definitive causation is difficult to prove in an uncontrolled environment, so apparent relationships based on first-hand observations were provided.

Based on the observations to date, it appears there were three discernable categories of noise/activity types and potential correlating behaviors:

- Noise or activity with no behavior;
- Noise or activity with small-scale behavior (by individuals, pairs, or small groups of herons); or
- Noise or activity with large-scale behavior (simultaneous behavior by a larger group of birds).

In addition, behaviors were noted during times with no observable noise or activity (no noise or activity with behavior).

Occurrences of observed behavior appear to have been most variable during noises or activities from:

- South March Point Road;
- Airplanes and boats; and
- T. Bailey operations.

However, behaviors were observed only some of the time during noise from these events.

Occurrences of observed behavior appear to have been most consistent when avian predators (bald eagles or red-tailed hawks) were in the vicinity of the heronry or lagoon. While a few instances of predator behavior (including circling, vocalizations, and perching) did not correlate with heron behavior, generally

these events appeared to disturb the group, as evidenced by observed large-scale behavior, such as simultaneous flushing and circling or vocalizations by multiple herons. This simultaneous behavior by multiple herons also occurred when at least one helicopter flew directly over the heronry.

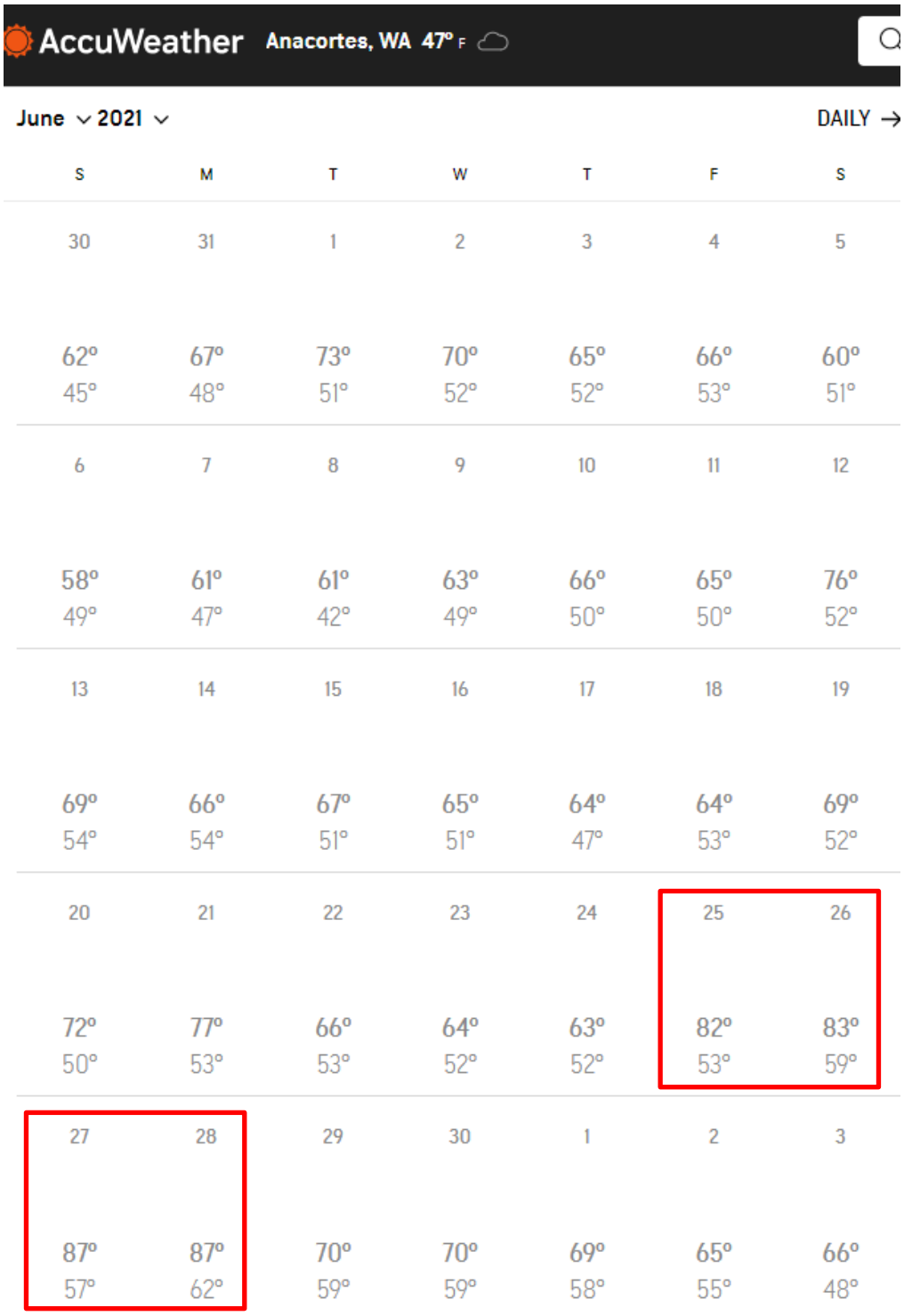
Results from Monitoring Periods 1 through 6 are summarized in this appendix. Unless otherwise noted, the behaviors listed are from the observer viewpoint focused on the heronry. Additionally, throughout the six monitoring period, many of the noises and/or activities occurred every day that observers were on-site.

Data tables are provided at the end of this appendix, with cumulative results from Monitoring Periods 1 through 4 provided in Table D-1. In addition, results from Monitoring Periods 1 through 4 are separated for each day of monitoring and provided in Tables D-2 through D-9. Data tables for Monitoring Periods 5 and 6 are not included because the herons were not observed using the March Point Heronry after July 3. Observations from this field effort were compared with observations provided by Skagit Land Trust to identify possible reasons for the absence of the herons during these two periods, which include the following:

- Aggressive eagle predation following hatching;
- The region-wide heat wave[1] (Figures D-1 and D-2) stressing the chicks or adults;
- The region-wide heat wave coupled with minus tides in Padilla Bay affecting foraging;
- Human disturbance (people entering heronry during the nesting season; a drone flying low etc.); and/or
- Some combination of the above.

[1] A record heat wave occurred across the region for approximately four days (June 25 through June 28) directly after the last day of Monitoring Period 4. Daily high temperatures recorded for this duration exceeded the average high temperature for the area (https://www.accuweather.com/en/us/anacortes/98221/june-weather/2253970?year=2021).

Figure D-1. June 2021 Temperatures in Anacortes, Washington



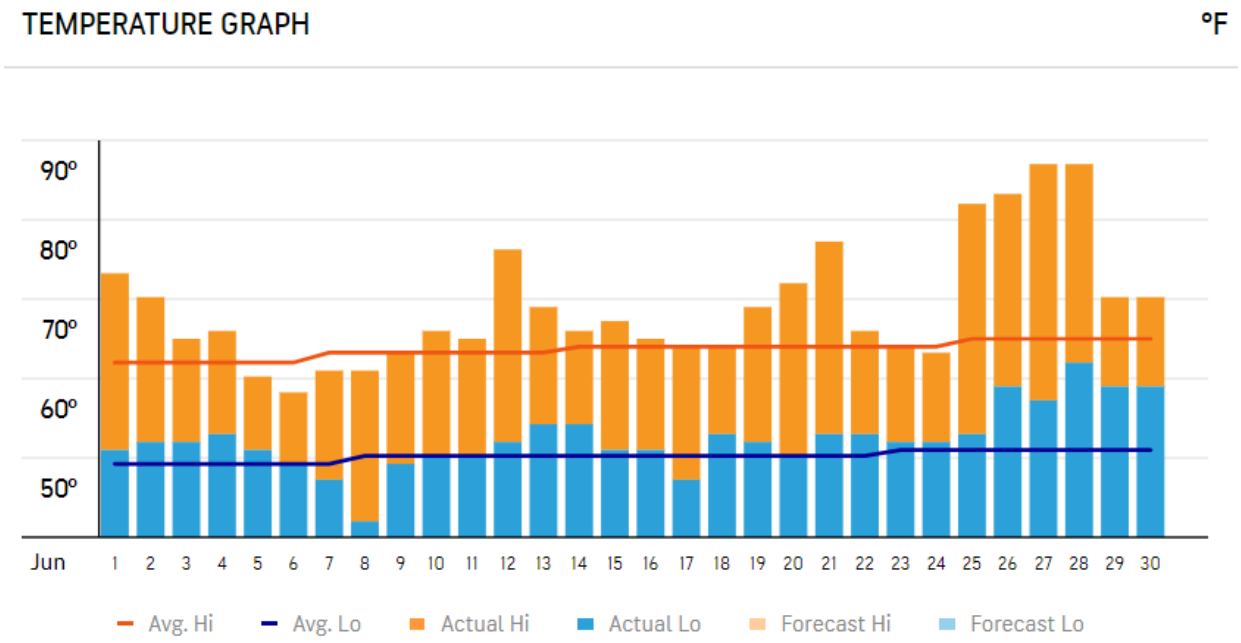
AccuWeather Anacortes, WA 47° F

June 2021 DAILY →

S	M	T	W	T	F	S
30	31	1	2	3	4	5
62° 45°	67° 48°	73° 51°	70° 52°	65° 52°	66° 53°	60° 51°
6	7	8	9	10	11	12
58° 49°	61° 47°	61° 42°	63° 49°	66° 50°	65° 50°	76° 52°
13	14	15	16	17	18	19
69° 54°	66° 54°	67° 51°	65° 51°	64° 47°	64° 53°	69° 52°
20	21	22	23	24	25	26
72° 50°	77° 53°	66° 53°	64° 52°	63° 52°	82° 53°	83° 59°
27	28	29	30	1	2	3
87° 57°	87° 62°	70° 59°	70° 59°	69° 58°	65° 55°	66° 48°

The area heatwave occurred between June 25 and June 28.
Data available at: https://www.accuweather.com/en/us/anacortes/98221/june-weather/2253970?year=2021.

Figure D-2. June 2021 Temperature Graph for Anacortes, Washington



As the graph indicates, there were 21 days above the average high temperature for the area.
The area heatwave occurred between June 25 and June 28.
Data available at: https://www.accuweather.com/en/us/anacortes/98221/june-weather/2253970?year=2021.

D.1.1 Monitoring Period 1

Heron behavior was observed during noise or activities from the T. Bailey facility operations and South March Point Road, during the presence of biologists and bald eagles, and possibly due to weather conditions (Tables D-2 and D-3). Other noises or activities that occurred when no apparent behaviors were observed included airplane and boat traffic, people and dogs walking in the inner lagoon and along South March Point Road, biologists and noise monitoring team presence on the landfill site, and a train horn.

Day 1: April 13 (12 p.m. to 4 p.m.)

- 12 p.m.–1 p.m.: Two herons flushed during operational noise from the T. Bailey facility.
- 12 p.m.–1p.m.: Three herons flushed for no observable reason.
- 1 p.m.–2 p.m.: Two herons flushed when a motorcycle passed on South March Point Road; the two herons may have returned after approximately eight minutes.
- 2 p.m.–3 p.m.: One heron flushed from the inner lagoon and flew towards the heronry when the biologist was walking on the landfill site.
- 2 p.m.–3 p.m.: Group vocalizations (chortles and screams) during nearby bald eagle activity (circling over the heronry, vocalizing, and perching near the heronry).
- 3 p.m.–4 p.m.: Ten herons circled the nest area for approximately one minute for an unknown reason; there were increased gusty winds at the time, and an equipment backup alarm from the T. Bailey site was audible just before the circling behavior began. Vocalizations (chortles) followed the circling behavior but could have been attributed to continued bald eagle presence.

Day 2: April 16 (9 a.m. to 1 p.m.)

- 9 a.m.–10 a.m.: One heron flushed when a semi-truck passed on South March Point Road.
- 9 a.m.–10 a.m.: Three herons flushed and six circled the nest area for no observable reason. Vocalizations (chortles) followed, and heron movement in the canopy was observed.
- 10 a.m.–11 a.m.: Four herons flushed during operational noise from the T. Bailey facility, followed by an additional flush of five herons that headed towards the inner lagoon during an equipment backup alarm from the facility.
- 10 a.m.–11 a.m.: Six herons flushed when a semi-truck passed on South March Point Road.
- 10 a.m.–11 a.m.: Six herons flushed, and three herons vocalized (chortles) for no observable reason.
- 11 a.m.–12 p.m.: Four herons flushed for no observable reason.
- 12 p.m.–1 p.m.: Three herons flushed during operational noise from the T. Bailey facility. Vocalizations (chortles and screams) followed, appearing to be more prevalent after cessation of the operational noise, and continued for approximately thirty minutes after the facility noises ended.
- 12 p.m.–1 p.m.: Vocalizations (chortles and screams) preceded a small flush of herons for no observable reason but could have been due to nearby red-tailed hawk/bald eagle presence (red-tailed hawk flying out of the heronry and bald eagle soaring overhead).

D.1.2 Monitoring Period 2

Heron behaviors were observed during red-tailed hawk/bald eagle presence, biologists' presence on the landfill site, traffic (South March Point Road, boat, and helicopters and planes over the heronry), during noise from T. Bailey operations, and possibly due to weather conditions (Tables D-4 and D-5). Other noises or activities that occurred when no apparent behaviors were observed included airplane and boat traffic, a train horn and alarm/siren from the T. Bailey facility.

Day 1: May 3 (2 p.m. to 6 p.m.)

- 2 p.m.–3 p.m.: Group vocalizations (screams) during red-tailed hawk activity (two circling the inner lagoon and one circling the outer lagoon).
- 3 p.m.–4 p.m.: Group vocalizations (chortles and screams) for no observable reason. A bald eagle then soared within the vicinity before landing near the heronry and two red-tailed hawks left the heronry.
- 4 p.m.–5 p.m.: Group vocalizations (chortles) by herons flying toward the lagoon.
- 5 p.m.–6 p.m.: Group vocalization (screams) during red-tailed hawk activity (flying within the vicinity of the heronry).

Day 2: May 5 (8 a.m. to 1 p.m.)

- 8 a.m.–9 a.m.: Five herons flushed from the landfill site and flew towards the heronry (with nesting material) due to biologists arriving on site.
- 8 a.m.–9 a.m.: Group vocalizations (chortles and screams) with no observable reason.
- 9 a.m.–10 a.m.: One heron flushed from the inner lagoon while a speed boat was in the Swinomish Channel.
- 9 a.m.–10 a.m.: Group vocalizations (chortles and screams) when a semi-truck passed on South March Point Road. Soon afterward, five herons flushed during noise from T. Bailey operations. Group vocalizations (chortles and screams) continued through most of the hour, and herons were observed circling the nest area for no observable reason.

- 10 a.m.–11 a.m.: Group vocalizations (chortles and screams) for no observable reason. Three herons were observed bringing nesting material or food back to the heronry.
- 11 a.m.–12 p.m.: Group vocalizations (chortles and screams) during bald eagle activity. A small flush of herons was observed during bald eagle activity (vocalizations and flying within the vicinity of the heronry).
- 11 a.m.–12 p.m.: Six herons flushed when a helicopter passed directly overhead; the herons returned after three minutes.
- 12 p.m.–1 p.m.: Vocalization (screams) during red-tailed hawk flying within the vicinity of the heronry. Bald eagle vocalization was also heard nearby.
- 12 p.m.–1 p.m.: An estimated 110 herons flushed from the outer lagoon for no apparent reason; the activity may have been caused by a nearby raptor activity.
- 12 p.m.–1 p.m.: One heron flushed as a plane flew overhead.

D.1.3 Monitoring Period 3

Heron behavior was observed during red-tailed hawk/bald eagle presence and the alarm/siren from the T. Bailey facility (Tables D-6 and D-7). Other noises or activities that occurred when no discernable behaviors were observed included traffic on South March Point Road, boat traffic, planes, helicopters, and noise from T. Bailey operations.

Day 1: June 1 (11 a.m. to 3p.m.)

- 11 a.m.–12 p.m.: Group vocalizations (screams and chortles) throughout most of the hour. Two herons circled the nest area during bald eagle activity (roosting nearby, vocalizing, and circling the heronry).
- 12 p.m.–1 p.m.: Group vocalizations (screams and chortles) prior to an estimated 23 herons flushing with most of the herons eventually returning back to the heronry—some headed toward the inner lagoon. Five herons circled the nest area during bald eagle activity (vocalizing, soaring overhead, and roosting nearby). Another 14 herons flushed and flew toward the inner lagoon during continued bald eagle activity.
- 1 p.m.–2 p.m.: An estimated 23 herons flew in from the inner lagoon and landed together in the heronry.
- 2 p.m.–3 p.m.: Group vocalizations (screams and chortles) prior to ten herons flushing during bald eagle and red-tailed hawk presence (bald eagles vocalizing, soaring overhead, and occasionally perching near roosting herons, as well as red-tailed hawks flying in and out of the heronry or within the vicinity).

Day 2: June 2 (11 a.m. to 3 p.m.)

- 11 a.m.–12 p.m.: Group vocalization (screams and chortles) were heard throughout most of the hour; 13 herons flushed, and five circled the nest area for approximately 1 minute before returning during bald eagle activity (included vocalizing).
- 11 a.m.–12 p.m.: An estimated 25 herons flushed and two circled the nest area during bald eagle activity (perching nearby, vocalizing, and soaring overhead). Most of the herons returned to the heronry following the flush event though some went toward the inner lagoon.
- 12 p.m.–1 p.m.: An estimated 67 herons flushed from the inner lagoon when a bald eagle landed on a piling; most herons returned to the lagoon immediately afterward.
- 12 p.m.–1 p.m.: A small group flushed during the alarm/siren from the T. Bailey operations.

- 12 p.m.–1 p.m.: Group vocalization (screams and chortles) prior to eight herons flushing during bald eagle and red-tailed hawk activity (bald eagle perched within the heronry with two vocalizing and soaring overhead; red-tailed hawks soaring nearby).
- 12 p.m.–1 p.m.: Vocalizations (screams and chortles) prior to a flush of three herons for no observable reason.
- 1 p.m.–2 p.m.: Vocalizations (screaming) prior to flush of ten herons (returned after one minute), and prior to one or two herons circling nest site (returned after one minute), during bald eagle activity (one perched within the heronry and others soaring from the heronry towards the inner lagoon).
- 2 p.m.–3 p.m.: Vocalization (screaming) prior to several small flushes (ranging between three to ten herons) over a two-minute period. Another 30 herons flushed with some moving to the inner lagoon but most returning to the heronry after one minute. These behaviors were observed during bald eagle presence.

D.1.4 Monitoring Period 4

Heron behavior was observed during noise or activities from the T. Bailey facility operations and people walking in the inner lagoon, and during the presence of bald eagles (Tables D-8 and D-9). Other noises or activities that occurred when no apparent behaviors were observed included traffic (South March Point Road, boat, helicopter, and planes), and biologists and noise monitoring team presence on the landfill site.

Day 1: June 21 (11 a.m. to 4 p.m.)

- 11 a.m.–12 p.m.: Group vocalizations (chortles and screams) during nearby bald eagle activity (circling over the heronry and vocalizing).
- 11 a.m.–12 p.m.: Two herons flushed from the inner lagoon as people were walking on a nearby island. Herons returned to the inner lagoon ten minutes later.
- 12 p.m.–1 p.m.: Group vocalizations (chortles) throughout the hour for no observable reason.
- 2 p.m.–3 p.m.: Group vocalizations (chortles) during nearby bald eagle activity (circling over the heronry and vocalizing).
- 3 p.m.–4 p.m.: One heron flushed from and then returned to the nest after approximately one minute during T. Bailey facility operational noise.
- 3 p.m.–4 p.m.: One heron flushed during nearby bald eagle activity (circling over the heronry).

Day 2: June 25 (7 a.m. to 11 a.m.)

- 7 a.m.–8 a.m.: Three herons flushed during nearby bald eagle activity (circling over the heronry and vocalizing). All three herons circled the nest area for approximately one minute before two flew toward the inner lagoon and one returned to the heronry.
- 8 a.m.–9 a.m.: Two herons circled the nest area for approximately one minute and an additional seven herons proceeded to leave nest area all at once headed west toward a nearby foraging sites for no observable reason.
- 8 a.m.–9 a.m.: Six herons flushed and flew west toward nearby foraging sites during nearby bald eagle activity (vocalizing).
- 9 a.m.–10 a.m.: One heron was observed flying along South March Point Road.

- 10 a.m.–11 a.m.: Two herons circled the nest area during bald eagle activity (vocalizing, circling the heronry, and perching nearby heronry). Group vocalizations (chortles) also occurred during bald eagle activity.

D.1.5 Monitoring Period 5

Few to no herons were observed during the period. Noise or activities that occurred when no apparent behaviors were observed included traffic (South March Point Road, boat, helicopters, and planes), bald eagle and red-tailed hawk presence, T. Bailey facility operations, and biologists and noise monitoring team presence on the landfill site. A record heat wave occurred across the region for approximately four days directly after the last day of Monitoring Period 4.

Day 1: July 3 (3 p.m. to 7 p.m.)

- Only six herons were observed from 3 p.m. to 4 p.m. at the start of the monitoring period in the inner lagoon prior to taking off toward the north where additional foraging sites are found. No additional herons were observed at either of the monitoring points throughout the entire period.

Day 2: July 6 (11 a.m. to 3 p.m.)

- No herons were observed at either of the monitoring points throughout the entire period.

D.1.6 Monitoring Period 6

No herons were observed throughout the monitoring period. For this reason, combined with the lack of herons observed during Monitoring Period 5, it was assumed that dispersal from the heronry was complete. Noise or activities that occurred included traffic (South March Point Road, boat, and planes), bald eagle presence, T. Bailey facility operations, and biologists and noise monitoring team presence on the landfill site. Due to the absence of herons at the monitoring sites after Day 1 of Monitoring Period 6, a Wood biologist searched nearby areas and found juvenile and adult herons using Fidalgo Bay to the northwest.

Day 1: July 27 (10 a.m. to 2 p.m.)

- No herons were observed at either of the monitoring points throughout the entire period.

Day 2: July 30 (7 a.m. to 11 a.m.)

- No herons were observed at either of the monitoring points throughout the entire period.

D.2 Biological Monitoring Data Tables

Cumulative results from Monitoring Periods 1 through 4 are provided in Table D-1 and discussed below. In addition, results from Monitoring Periods 1 through 4 are separated by day and provided in Tables D-2 through D-9. Data tables for Monitoring Periods 5 and 6 are not included because the herons were not observed using the March Point Heronry after July 3. For this analysis, only perceived reactions involving flushing and/or circling are included in the tables since those behaviors could be considered more indicative of a potential response to a disturbance than other observed behaviors (i.e., vocalizations of brief duration).

As shown in Table D-1, observers recorded a total of 272 unique events and 67 total perceived reactions, although a unique event could not be specifically identified for 35 of those perceived reactions. For the events that could be identified, the herons exhibited perceived response behavior at a rate of 11.8 percent (32 total perceived reactions to 272 total events).

Events that appeared to elicit the highest number of reactions (number of perceived reactions to the unique event per 67 total reactions) included unknown/unidentified events (52.2 percent) and avian predator presence (22.4 percent). The remaining events with perceived reactions included avian predator

vocalizations (7.5 percent), noise from the neighboring T Bailey facility (7.5 percent), people walking/talking (3 percent), aircraft (1.5 percent), boats (visual only) (1.5 percent), helicopters (1.5 percent), motorcycles (1.5 percent), and semi-trucks (1.5 percent). Also, of the 272 events, there were 32 where no clear response behavior was observed; these are represented by the seven event types shown at the end of Table D-1.

Most behaviors were observed in and around the heronry itself, with few observations of flushing and/or circling at the lagoon foraging sites. The observations recorded at the foraging site more frequently involved use of the lagoon north of the railroad tracks and closer to the islands located within Padilla Bay than the Whitmarsh Landfill site. There were only a few recorded observations of herons using the inner lagoon on the south side of the railroad tracks closest to the landfill site. This area often drains quite low during summer low tides, and it may not support extensive food sources. Overall, the herons appeared to react less frequently during noise events while using the foraging site than the heronry, apart from apparent disturbances from avian predators like bald eagles.

It should be noted that in an environment with events occurring simultaneously and/or repeating on a regular basis, combined with potential simultaneous reactions of various types by individuals or groups of herons, it can be difficult to record all information thoroughly at all times. For example, the number of events identified may be underrepresented for specific event types such as those from the T. Bailey facility and traffic. These events tended to be persistent throughout the entire monitoring period, and therefore may have only been recorded once instead of multiple times, depending on the circumstances of the period. Also, in the case of behaviors observed where no event was identified by the observer, it's reasonable to assume that the herons could have been reacting to something that was out of the viewpoint or hearing range of the observer or that what was observed was general heron behavior not in response to any particular event of interest, or possibly reactions to other herons.

While it's likely that not all noise events were recorded, as possibly evidenced by the unknown/unidentified events responsible for 52.2 percent of the perceived responses, 46 unique noise events were recorded from the T. Bailey facility (backup alarms and general industry noise) and only five perceived reactions (involving flushing and/or circling) to these noise events were observed. Given the similarities between the T. Bailey facility noise and the noise anticipated from construction activities at the Whitmarsh Landfill, a similar level and rate of reactions could be anticipated to occur during construction on the landfill site.

Table D-1. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Periods 1 through 4
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	0	35	NA	NA	52.2
Avian Predator (Visual Only)	72	15	20.8	5.5	22.4
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	46	5	10.9	1.8	7.5
Avian Predator Vocalizations	30	5	16.7	1.8	7.5
Person Walking/Talking	15	2	13.3	0.7	3.0
Helicopter	7	1	14.3	0.4	1.5
Aircraft	34	1	2.9	0.4	1.5
Motorcycle	7	1	14.3	0.4	1.5
Semi-truck Passing/Braking	5	1	20	0.4	1.5
Passing Boat (Visual Only)	24	1	4.2	0.4	1.5
Boat Horn/Engine	3	0	0	0	0
Facility Alarm/Siren	4	0	0	0	0
Traffic (General)	13	0	0	0	0
Vehicle Horn	3	0	0	0	0
Emergency Vehicle Sirens	2	0	0	0	0
Train Horn/Passing	4	0	0	0	0
Wind	3	0	0	0	0
Total	**272**	**67**	**NA**	**11.8**	**NA**

Abbreviations:
NA = not applicable

Table D-2. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 1, Day 1 (4/13/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	NA	5	NA	NA	50
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	11	3	27.3	10.3	30
Motorcycle	2	1	50	3.5	10
Person Walking/Talking	2	1	50	3.5	10
Boat Horn/Engine	2	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Helicopter	0	0	0	0	0
Aircraft	5	0	0	0	0
Traffic (General)	0	0	0	0	0
Vehicle Horn	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Semi-truck Passing/Braking	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Wind	2	0	0	0	0
Avian Predator Vocalizations	1	0	0	0	0
Passing Boat (Visual Only)	0	0	0	0	0
Avian Predator (Visual Only)	4	0	0	0	0
Total	**29**	**10**	**NA**	**17.3**	**NA**

Abbreviations:
NA = not applicable

Table D-3. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 1, Day 2 (4/16/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	NA	7	NA	NA	77.8
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	10	1	10	2.3	11.1
Semi-truck Passing/Braking	2	1	50	2.3	11.1
Boat Horn/Engine	0	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Helicopter	0	0	0	0	0
Aircraft	5	0	0	0	0
Motorcycle	4	0	0	0	0
Traffic (General)	4	0	0	0	0
Vehicle Horn	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Train Horn/Passing	2	0	0	0	0
Wind	0	0	0	0	0
Avian Predator Vocalizations	1	0	0	0	0
Person Walking/Talking	5	0	0	0	0
Passing Boat (Visual Only)	4	0	0	0	0
Avian Predator (Visual Only)	6	0	0	0	0
Total	**43**	**9**	**NA**	**4.6**	**NA**

Abbreviations:
NA = not applicable

Table D-4. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 2, Day 1 (5/3/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	NA	1	NA	NA	100
Avian Predator (Visual Only)	6	0	0	0	0
Aircraft	4	0	0	0	0
Traffic (General)	4	0	0	0	0
Person Walking/Talking	2	0	0	0	0
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	1	0	0	0	0
Motorcycle	1	0	0	0	0
Vehicle Horn	1	0	0	0	0
Semi-truck Passing/Braking	1	0	0	0	0
Wind	1	0	0	0	0
Boat Horn/Engine	0	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Helicopter	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Avian Predator Vocalizations	0	0	0	0	0
Passing Boat (Visual Only)	0	0	0	0	0
Total	**21**	**1**	**NA**	**0**	**NA**

Abbreviations:
NA = not applicable

Table D-5. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 2, Day 2 (5/5/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	NA	15	NA	NA	60.0
Avian Predators (Visual Only)	3	3	100	6.5	12.0
Avian Predators Vocalizations	3	2	66.7	4.3	8.0
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	4	1	25	2.2	4.0
Helicopter	3	1	33.3	2.2	4.0
Aircraft	8	1	12.5	2.2	4.0
Person Walking/Talking	2	1	50	2.2	4.0
Boat Passing (Visual Only)	11	1	9.1	2.2	4.0
Boat Horn/Engine	1	0	0	0	0
Facility Alarm/Siren	3	0	0	0	0
Motorcycle	0	0	0	0	0
Traffic (General)	3	0	0	0	0
Vehicle Horn	1	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Semi-truck Passing/Braking	2	0	0	0	0
Train Horn/Passing	2	0	0	0	0
Wind	0	0	0	0	0
Total	**46**	**25**	**NA**	**21.8**	**NA**

Abbreviations:
NA = not applicable

Table D-6. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 3, Day 1 (6/1/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Avian Predators (Visual Only)	17	5	29.4	14.7	100
Unknown/Unidentified	NA	0	NA	NA	0
Boat Horn/Engine	0	0	0	0	0
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	0	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Helicopter	2	0	0	0	0
Aircraft	2	0	0	0	0
Motorcycle	0	0	0	0	0
Traffic (General)	0	0	0	0	0
Vehicle Horn	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Semi-truck Passing/Braking	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Wind	0	0	0	0	0
Predator Avian Vocalizations	6	0	0	0	0
Person Walking/Talking	0	0	0	0	0
Boat Passing (Visual Only)	7	0	0	0	0
Total	**34**	**5**	**NA**	**14.7**	**NA**

Abbreviations:
NA = not applicable

Table D-7. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 3, Day 2 (6/2/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Avian Predator (Visual Only)	17	5	29.4	19.2	50
Unknown/Unidentified	NA	3	NA	NA	30
Avian Predator Vocalizations	6	2	33.3	7.7	20
Boat Horn/Engine	0	0	0	0	0
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	0	0	0	0	0
Facility Alarm/Siren	1	0	0	0	0
Helicopter	0	0	0	0	0
Aircraft	0	0	0	0	0
Motorcycle	0	0	0	0	0
Traffic (General)	0	0	0	0	0
Vehicle Horn	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Semi-truck Passing/Braking	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Wind	0	0	0	0	0
Person Walking/Talking	0	0	0	0	0
Boat Passing (Visual Only)	2	0	0	0	0
Total	**26**	**10**	**NA**	**26.9**	**NA**

Abbreviations:
NA = not applicable

Table D-8. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 4, Day 1 (6/21/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Avian Predator (Visual Only)	6	1	16.7	3.7	100
Unknown/Unidentified	NA	0	0	NA	0
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	10	0	0	0	0
Avian Predator Vocalizations	4	0	0	0	0
Person Walking/Talking	4	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Aircraft	1	0	0	0	0
Traffic (General)	1	0	0	0	0
Vehicle Horn	1	0	0	0	0
Boat Horn/Engine	0	0	0	0	0
Helicopter	0	0	0	0	0
Motorcycle	0	0	0	0	0
Emergency Vehicle Sirens	0	0	0	0	0
Semi-truck Passing/Braking	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Wind	0	0	0	0	0
Boat Passing (Visual Only)	0	0	0	0	0
Total	**27**	**1**	**NA**	**3.7**	**NA**

Abbreviations:
NA = not applicable

Table D-9. Events and Perceived Heron Reactions (Flushing & Circling) – Monitoring Period 4, Day 2 (6/25/21)
March Point Heronry, Anacortes, WA

Event Type	Events (#)	Perceived Reactions (#)	Perceived Reactions/ # Unique Event (%)	Perceived Reactions/ Total # Events (%)	Perceived Reactions/ Total # Reactions (%)
Unknown/Unidentified	NA	4	NA	NA	66.7
Avian Predator (Visual Only)	13	1	7.7	2.2	16.7
Avian Predator Vocalizations	9	1	11.1	2.2	16.7
T Bailey Facility Noise (Backup Alarms, General Industry Noise, Other)	10	0	0	0	0
Person Walking/Talking	0	0	0	0	0
Facility Alarm/Siren	0	0	0	0	0
Aircraft	9	0	0	0	0
Traffic (General)	1	0	0	0	0
Vehicle Horn	0	0	0	0	0
Boat Horn/Engine	0	0	0	0	0
Helicopter	2	0	0	0	0
Motorcycle	0	0	0	0	0
Emergency Vehicle Sirens	2	0	0	0	0
Semi-truck Passing/Braking	0	0	0	0	0
Train Horn/Passing	0	0	0	0	0
Wind	0	0	0	0	0
Boat Passing (Visual Only)	0	0	0	0	0
Total	**46**	**6**	**NA**	**4.4**	**NA**

Abbreviations:
NA = not applicable

Appendix E

Construction Noise Modeling

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
2020 Winston Park Drive, Suite 600
Oakville, Ontario L6H 6X7
Canada
T: 905-568-2929
www.woodplc.com

Technical Memo

To:	Tim Reinhardt, Wood	**Date:**	December 03, 2021
From:	Mohammad Abushanab, Wood		
CC:	Koorus Tahghighi, Wood		
	Buddy Ledger, Wood		
Ref:	PS21204410.03		
Re:	Whitmarsh Landfill PLP Group – Construction Noise Model Anacortes, Washington		

1.0 Introduction

This memorandum presents the results of noise modelling of the proposed construction operations at the Whitmarsh Landfill. The noise modelling was completed to predict the noise levels resulting from construction activities associated with the anticipated construction equipment operation at the March Point Heronry. The noise modelling was completed using the Cadna/A sound propagation and prediction software package, published by Datakustik GmbH. The Cadna/A noise modelling was configured to implement the ISO 9613-2 environmental sound propagation algorithms. Noise levels were predicted for two (2) locations at the boundary of the March Point Heronry and a third location to represent the intertidal foraging zones along the northern boundary of the site. The two locations (receptors) at the March Point Heronry were chosen such that they were at points on the heronry boundary which correspond to the closest locations with respect to the proposed construction. The intent of the noise model was to predict and compare the predicted noise levels with the measurements from the noise monitoring program during the spring and summer of 2021. The noise model receptors correspond to the same locations utilized for the noise monitoring program resulting in the ability to make direct comparisons.

2.0 Noise Impact Assessment

2.1. Methodology

To provide an accurate prediction of sound levels at the identified receptors, due to noise emissions from a specific source(s), the modelling considered the following factors:

- Source sound power level and directivity;
- Distance attenuation;
- Source-receptor geometry, including heights and elevations;
- Barrier effects of surrounding buildings and topography; and
- Ground and air (atmospheric) attenuation.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

2.2. Noise Sources

Table 1 lists the assumed pieces of equipment to be used at the Whitmarsh Landfill site and their average maximum noise levels at 50 feet. The noise levels were obtained from the Washington State Biological Assessment Preparation Manual, specifically "Chapter 7.0 Construction Noise Impact Assessment"[1]. The resulting sound power level (PWL) corresponding to the average maximum sound pressure level (average L_{max} for an activity) at 50 feet was calculated for each source, assuming hemi-spherical divergence over a reflecting plane (ground) from a point source of sound. The resulting point source sound power levels are also provided in Table 1. Figure 1 illustrates the noise sources identified at the site.

Table 1: Construction Equipment List and Noise Emission Levels

Equipment	Quantity	L_{max} at 50 feet (dBA)	Sound Power Level (PWL, dBA)
Dump Truck	2	91	123
Excavator	1	87	119
Flatbed Truck	2	81	113
Dozer	1	86	118
Generator-5KVA	1	73	105
Trash Pumps	3	74	106

For the purposes of the noise modelling and to predict a worst-case scenario, it was assumed that all pieces of equipment would be operating simultaneously. Should the equipment used during construction differ from the above assumptions, exceed the reference maximum noise level or the corresponding equivalent sound level, an update to the noise assessment or further detailed study may be required.

2.3. Receptors

Noise levels were predicted at three (3) receptors, which correspond to the locations of the following noise monitoring sites:

- Noise monitoring site SW, near the western extent of the heronry, south of March Point Road;
- Noise monitoring site SE, near the eastern extent of the heronry, south of March Point Road;
- Noise monitoring site N, near the northern boundary of the Whitmarsh Landfill site, to represent the intertidal foraging zones along the boundary with the Swinomish Tribal lands to the east.

3.0 Modeling Results

The predicted noise level at each receptor is presented in Table 2. The noise metric used to assess the off-site exposure is the A-weighted one-hour equivalent sound level (L_{eq}-1h), assuming 100% equipment utilization, which corresponds to the average maximum noise level (L_{max}) for the same period. The predicted values are compared to the L_{max} values measured during the noise monitoring program as the equipment average maximum noise level (L_{max}) was used to predict the noise impact at the receptors.

Table 2: Summary of Noise Modeling Results

Receptors	Predicted Noise Level L_{max} (dBA)
SE (Nesting Area)	69
SW (Nesting Area)	62
N (Foraging Area)	56

Note: The predicted noise level is based on 100% equipment utilization

According to the results, the predicted noise levels do not exceed the upper tolerance limit (UTL) of the recorded L_{max}. Therefore, the activities from the landfill are not expected to negatively impact the Heronry or exceed the existing maximum levels.

4.0 Conclusion

Noise modeling was conducted for construction activities and the anticipated equipment at the Whitmarsh Landfill site to predict the noise impact at the March Point Heronry.

This document is intended for the purpose of documenting environmental monitoring programs and supporting environment management of the Whitmarsh Landfill Project, specifically noise control. The findings and interpretations as outlined herein are based on the expertise of Wood and their representative specialists based on information available at the time of document preparation.

Should you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited

Prepared by:



Mohammad Abushanab, M. Eng.
Specialist, Acoustics & Vibration

Reviewed by:



Buddy Ledger, M.A.Sc., P.Eng., INCE
Discipline Lead, Acoustics & Vibration

Attachments

Figure 1: Aerial Map with Noise Source & Receptor Locations

5.0 References

1. Biological Assessment Preparation Manual. Chapter 7.0 Construction Noise Impact Assessment. Washington State Department of Transportation 2020.

PADILLA BAY

STAGING AREA GENERATOR 5kva

NOISE MONITORING SITE: N

APPROXIMATE EXTENT OF SOLID WASTE

BNSF RAILROAD

PADILLA BAY INNER LAGOON

EXISTING ROADWAY

GATE

P19687

EXISTING CULVERT

P19712

APPROXIMATE EXTENT OF SOLID WASTE

DELIVERY TRUCK

DOZER

DUMP TRUCK

TREATMENT AREA WITH PUMPS

GROUNDWATER EXTRACTION TRENCH

EXCAVATOR

SWINOMISH INDIAN TRIBAL LANDS

PARCEL#: P19677 QUATTRO PROPERTIES LLC

PARCEL#: P19675 QUATTRO PROPERTIES LLC

NOISE MONITORING SITE: SW

232

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

PARCEL#: P104357 SKAGIT LAND TRUST

MONITORING POINTS ALONG PROPERTY LINE

PARCEL#: P19684 MOON CHARLES CREDIT TRUST & MOON M ELLEN TRUSTEE

HERONRY NESTING AREA

PARCEL#: P19763 SALISH TRUST

PARCEL#: P19763 SALISH TRUST

PARCEL#: P19675 QUATTRO PROPERTIES LLC

PARCEL#: P19765 SKAGIT LAND TRUST

STATE ROUTE 20

EXPLANATION

- PARCEL LINE
- STORMWATER SWALE CENTERLINE
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- GROUNDWATER EXTRACTION TRENCH
- ELEVATION CONTOUR IN FEET (5FT INTERVALS) (MLLW) (OFFSITE CONTOURS APPROXIMATED FROM USGS TOPOGRAPHIC MAP)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD

0 75 150

APPROXIMATE SCALE IN FEET

NOISE SOURCES AND RECEPTORS
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/11/22	Project No. PS21204410
wood.		Figure 1

Plot Date: 02/11/22 - 2:56pm, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_012822.dwg

Appendix F

March Point Heronry Behavioral Monitoring Log

Figure x

March Point Heronry Behavioral Monitoring Log

Monitor:		**Location (GPS Coords):**		
Weather:				
Time	**Activity**	**Response**	**Number of Herons**	**Notes**

Activity Code: LF = Landfill Site, RR = Railroad, MP= March Point Rd, E = Equipment, S = Sound, V = Visual, T= Trespass, IN = Sudden Loud Noise

Response Codes: NN = None, V/C = Chortle, V/S = Scream, FH = Flush, CI = Circling, AW = Away, RE ( ) = Return (in minutes), NR = No Return

Response to Comments
Heron Management Plan
Whitmarsh Landfill

August 2022

This response to comments is provided to address comments received by the City of Anacortes from the Skagit Land Trust (SLT) and Ann Eissinger regarding Wood Environment & Infrastructure Solution, Inc.'s Heron Management Plan (HMP) for the Whitmarsh Landfill remediation project. We appreciate the time they took to review and provide comments and detailed information for this project. The project proponent is committed to implementing measures to avoid, minimize, and mitigate for noise and visual impacts while completing the remediation and restoration activities within the existing seasonal limitations. This response to comments consists of two sections: a General Comments section, where responses are provided in general terms to address several comments, and a Specific Comments section, where direct responses to specific comments are provided.

General Comments

The SLT letter provided the following summary of suggested alterations to the HMP to better meet the City of Anacortes Critical Area Code and Washington Department of Fish and Wildlife (WDFW) guidelines:

- Articulate that the HMP's objective includes mitigation and monitoring for both auditory and visual impacts that may affect the herons.
- The construction schedule and sequencing where earth moving activities begin furthest away from the heronry and move clockwise should be required, and not be conditional based on noise level findings during construction.
- The biological and noise monitoring schedule should be better articulated, and frequency increased substantially from what is proposed. It should also be dependent on meeting acceptable behavioral and noise monitoring criteria.
- Many of the measures listed in Section 4.3, Equipment Noise Mitigation, as possible to do "if the noise generated reaches the maximum allowable levels" should be required through the end of the nesting season.
- Many of the measures listed in Section 4.4, Other Mitigation Measures, should be required through the end of the nesting season, as they will minimize visual disturbance.

There was some overlap with comments provided by Ann Eissinger. In response, we are providing the following clarifications and discussions regarding the intent of the HMP.

1. The minimization and monitoring of noise and visual disturbance are major project objectives. The HMP was written based on site-specific data gathered during the recent noise/biological monitoring study conducted in 2021. There were related comments about including historical observations in the HMP. Historical observations could not be used in the noise/biological monitoring study to correlate noise to herons' response, and therefore, use of the historical observations is also outside the scope of the HMP. Likewise, it would have been impossible to simulate or observe the impact of a visual disturbance comparable to the future construction. Thus, the objective stated in the opening paragraph of the HMP does not include establishing

allowable limits on visual impacts, but monitoring for visual disturbance is included as an objective of the monitoring during construction (see Section 4.5 of the HMP).

Monitoring for visual disturbance during construction will include various observations beyond the overall heronry, including lagoon use and alteration of normal flyway patterns. The contractor has an inherent motivation to be efficient in their operations and thus unnecessary driving or moving equipment around the site is not something that happens. A note will be added to the specifications to minimize travelling across the site. Project activities are planned to occur in ordered sections of the site, starting with the location farthest from the heronry, in consideration of varying degrees of sensitivity over the nesting season. This planned rotation of focused work activities, along with other mitigation measures, will also allow open areas for flyways over the site at any given time to help avoid causing significant alternations of flyway and inner lagoon use patterns. It is understood that possible additional mitigation measures may need to be considered depending on the observed results.

The planned approach also keeps the history of the Whitmarsh landfill site in mind. The heronry was formed in the 1950s and has thrived since, despite the nearby human activities. The two main historical activities that took place on the landfill site included the construction and operation of the landfill itself from the 1950s until 1973 and the operation of a sawmill for over 20 years (late 1980s until 2009). The attached Figures A and B show a pictorial development of the site and the sawmill operations through the years.

The landfill originally started by unpermitted dumping of waste into Padilla Bay, but later was taken over by Skagit County and operated as a solid waste landfill. Landfill operations involved numerous daily garbage truck deliveries, private vehicle/truck deliveries, and initially burning of the waste, which later was changed by Skagit County to using heavy equipment such as bulldozers to move and compact the waste. The subsequent sawmill operations likewise included substantial truck traffic to import logs and export finished product. Large forklifts traveled across the site to move logs to storage locations on the east side of the site (Figure B) and then back to the mill for processing. The sawmill operations were sufficiently loud that ear protection was needed near the sawmill.

The March Point Heronry became protected by the Skagit Land Trust after the donation of the land to SLT in 1994. In 2004, the SLT documented 575 nests on the site and in 2019, 680 nests were counted (https://www.skagitlandtrust.org/properties/heronry.aspx). Considering that the growth of the heronry has coincided with the historic neighboring landfill and sawmill operations, this indicates the herons adapted to their surroundings over the years. As stated in the letter of support from the United States Fish and Wildlife Service (USFWS):

"The Service's Washington Ecological Services Office (WA-ES) and Pacific Region Migratory Birds Program both reviewed the draft Plan. The Service appreciates the good preparation that is evident in the Plan, and we expect that successful implementation of the Plan will avoid and minimize significant impacts to the heron rookery, individual birds, and their nests with eggs and young."

2. The construction schedule was developed based on three factors: (1) completing the project in one dry weather construction season to avoid the increased likelihood of releasing pollutants into Padilla Bay, which would be damaging not only to the herons, but to all wildlife in the area, tidal cycles allowing for longer daylight working days at low tide events, and (3) the heron breeding season and related sensitivities. The sequencing of activities on the site based on heronry

sensitivities will be implemented; it is not conditional. Scientists who conducted the noise study and prepared the HMP provided recommendations to include in the design for the contractor to implement, hence the wording used in the document.

Mobilization and site setup are scheduled to begin after the most sensitive time of the breeding season, which typically ends approximately at the beginning of April. The favorable tides that allow work to proceed along the shoreline occur in June and July (tide information is publicly available online and in published tide charts). The schedule presented in Table 1 of the HMP allows the project to be completed by the start of the wet season, November 1. Table 1 also shows a conservative nesting time frame at the bottom. A more specific nesting season for the past three years is shown below.

Comparison Chronology of March Point Nesting Season Transitions 2019 to 2021			
Transitions	**2019**	**2020**	**2021**
Staging	Jan 25	Jan 8	Jan 12
Re-occupation	Mar 15	Mar 1	Mar 3
Incubation	Apr 12	Apr 6	Mar 23
Hatching	May 13	May 4	May 8
Fledging	Jul 2	Jul 3	June 27
Dispersal complete	Aug 2	Jul 15	July 5

Source: Report on the 2021 March Point Heronry Breeding and Nesting Season – Skagit Land Trust

As indicated by the dispersal dates observed by the SLT over the last three years, the heronry has experienced varying completion dates of their breeding season, none of which are known to have been related to human activity or noise.

3. The level of monitoring proposed during construction is appropriate for the project to start and will be adjusted if needed. The second paragraph of Section 4.5 in the HMP states:

   "Biological monitoring will be performed during staging and site setup activities and throughout the entirety of the first week of earth-moving construction. Biological monitors will be on site to observe the herons and ensure there are no adverse behaviors observed. Afterwards, biological monitoring will be reduced to once per week during construction. The once-a-week biological monitoring will be scheduled to coincide with planned noise measurements and changes occurring on the site, such as changes in construction activities, when new equipment or multiple pieces of equipment will be in use (generating a potential change in noise level and/or general activity level), or when there is a change in the proximity of work to the heronry. Frequency of biological monitoring can be reevaluated if there are indications that the herons are responding negatively to work activities."

   To clarify this original monitoring language in the HMP, Wood intends to have a professional biologist conduct the observations during mobilization/demobilization and during the first week of construction. Beyond that, the professional biologist will monitor at an average of once per week and monitoring will be targeted to occur during any new or changing task (for example, when a new location and/or new or additional equipment will be utilized). This will allow monitors

to observe/gauge heron response to changing site conditions (noise and visual) and provide opportunities for adjustments in the work and/or monitoring schedules, activities, and mitigation measures as necessary to avoid disturbance. Work will be paused as appropriate to evaluate and adjust project activities and mitigation measures in response to significant heron disturbance and to prevent reoccurrence of such significant disturbances, since repetition of disturbing activities can cause abandonment of the heronry.

Also, full-time representatives of Skagit County (Inspectors) will be on site throughout the duration of construction to inspect the work. These personnel will be trained and guided by the professional biologists to observe the heron's response to visible site activity and will use handheld noise level instruments, referred to as "roving" sound level meters in Section 4.2 of the HMP, to monitor the noise levels in real time. On-site personnel will be available at all times to implement additional appropriate mitigation measures, if needed. Stationary noise monitors will also be deployed to record noise levels during construction (Section 4.2). During the first week of the project the noise readings will be downloaded to verify correlation of recordings with the handheld instrument. Wood is open to utilizing additional monitoring tools as available, such as the live-feed cameras offered by the SLT, to help further observe potential stress indicators and avoid disturbance. This, as well as additional data from SLT from 2022, is welcomed for further planning purposes, especially for ensuring early identification of "patterns that are indicative of a colony in stress or patterns similar to large colony pre-abandonment."

4. The proposed project is a mandatory Washington State Department of Ecology (Ecology) cleanup project being completed under the Model Toxics Control Act to comply with the State of Washington landfill design requirements. Therefore, some of the suggested measures to maintain or improve heronry habitat are not possible to implement, e.g., planting trees on the landfill. The Ecology/MTCA requirement is to install a low-permeability layer to minimize the infiltration of stormwater that is the source of the seeps observed in the bay. Therefore, the layer needs to be protected against damage by roots or burrowing animals. The cap system from the bottom up includes: a low permeability geosynthetic clay liner, 6 to 8 inches of sand, 12 inches of crushed rock, 12 inches of cover soil, and 6 inches of topsoil. The crushed rock is included in the design to protect the low permeability layer against those possibilities. The completed project will result in a grass-covered site with approximately 2 acres of new shoreline habitat, vegetated with native shrubs. The completed project will eliminate or minimize release of pollutants to the inner lagoon, thus improving the quality of the habitat for all wildlife that use the area.

   The HMP was reviewed and supported by the USFWS:

   "Ecology and Skagit County identify, and have already begun to proactively implement, mitigation measures that we deem appropriate and effective; including, measures that address staging, sequence, and progress of work; minimization of sources of sound and visual disturbance; monitoring and reporting; and, adaptive management to address possible contingencies. With successful implementation of the Plan, the Service believes that incidental take under MBTA [Migratory Bird Treaty Act], the unintentional disturbance and subsequent loss of nests with eggs or young, is unlikely."

   A Pre-Application conference call was held prior to submitting the Joint Aquatic Resource Permit Application (JARPA) in June 2021, which was attended by all relevant agencies. The State of Washington Department of Fish and wildlife (WDFW) as a well as the USF&W were present, during which the WDFW deferred to the USF&W. The HMP was sent to the USF&W following

their request to review the document. We believe the HMP properly addresses the concerns and satisfies the local, state, and the primary federal authority on the subject. The HMP was prepared by the scientists who provided recommendations for mitigation. Those recommendations listed in Sections 4.3 and 4.4 of the HMP, and cited by the SLT, will be incorporated into the project specifications to be implemented. Some of the wording in those sections, such as "can be considered," regarding mitigation for noise and visual disturbance could have been misleading. The recommendations also provide the field representatives with the tools and measures to utilize and implement in any given situation to avoid, minimize, or mitigate disturbance since a construction project is dynamic and situations and conditions vary. The goal is to create adaptable management that can recognize and respond to any condition that may arise so that concerns are addressed immediately. We trust this explanation clarifies the intent.

Specific Comments

Skagit Land Trust

1. *"Skagit Land Trust owns [parcels] P104357, P19765 and P135657. P135657 is a portion of what is shown on the map as P19684 as owned by the Moons. The parcel was split into two parts, the western portion above March Point Road is now owned by Skagit Land Trust. P19675 is owned by Quattro Properties LLC and is also in two parts. There is a Conservation Easement held by Skagit Land Trust on the part along hwy [Highway] 20."*

Response: Figures 1 and 3 have been updated to show current ownership; they are attached.

2. *"The City of Anacortes should be notified of any significant disturbance to the herons from construction activities and they must have permission to notify Skagit Land Trust. We assume that construction activities will take place at days and times the City is open so that such notification is always available. If not, a backup plan should be described.*

   Weekly reports will be submitted electronically to the City of Anacortes during each week with permission to share these with Skagit Land Trust.

   Data used to assess the effectiveness of monitoring protocol and elicit "questions or suggestions for ongoing activities to help create an adaptive approach to the monitoring efforts" should be reviewed after each monitoring period and following implementation of any contingencies employed to correct any observed significant heron disturbance."

Similar comments regarding project communications during construction were also received from Ann Eissinger.

Response: The remediation project will be conducted under consent decree and any delays will have adverse effects on several factors associated with the project. Skagit County is committed to protecting the heronry by following the recommendations made in the HMP that were supported by the US Fish & Wildlife Service. The frequency, level, and content of communications to others outside the project will depend on the situation and in discussions with Ecology at the time of construction and is considered outside the scope of the HMP.

Ann Eissinger

3. *"A map providing a clear demarcation of the heron colony and project area is provided in the HMP, however there is no map providing colony buffers, specific habitat use areas, distances to project area activities, or site elevations (pre and post construction), all of which would be helpful."*

Response: City of Anacortes Municipal Code 19.70.335 acknowledges the WDFW buffers of 197 feet year-round for urban areas and 656 feet for a seasonal buffer, then goes on to require a year-round buffer of 984 feet for this heronry, as stated in Section 1.2, which encompasses the project site. This is the reason the buffer boundaries were not shown on the HMP figures. Figures 2 and 5 (attached) have been updated to show the buffers for reference.

Figure 3 has been revised to include the existing grades and Figure 5 has been revised to show the final grades; both figures are attached.

Figure 4 of the HMP exhibits existing potential heron foraging areas. Since it is known that the herons can utilize the overall project site for pre-nesting staging and that the project will not commence until after this staging period ends, this known habitat use is not identified on the figures.

4. *"There needs to be a clarification about the Noise Modeling Results (Table 6 and 4). How can the anticipated construction noise levels be lower than maximum ambient avg Lmax? Were the ambient levels included in the modeling for construction noise or are the construction noise values on top of the ambient levels? What were the distances used in the modeling calculations?"*

Response: The construction noise cited in Table 6 is the anticipated noise level at the monitoring locations, next to the heronry, not at the equipment locations.

Impact of two different noise levels cannot be calculated by a mathematical sum and the impact of the actual overlapping ambient and construction noise levels will vary based on frequency and wavelength, which is why field measurements will be taken.

Scales are shown on each figure to help determine distances, where needed. A specific distance of 232 feet, which is expected to be the closest the construction equipment will be to the heronry at the end of the breeding season, is shown on Figure 5. This is the worst-case scenario that was used for modeling.

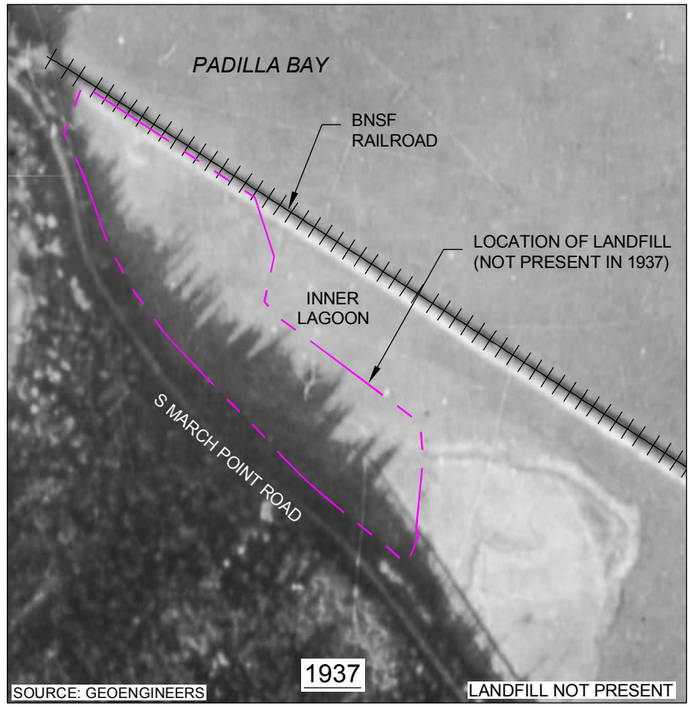
5. *"It would help mitigate overall noise by temporarily closing the segment of S. March Point Road between T Bailey and the Trading Post. That would also redirect construction traffic and T Bailey traffic away from the colony frontage roadway - to the safer intersection at Reservation Rd. This would not affect Casino traffic."*

Response: Construction traffic access to the landfill will be from the west on S. March Point Road. Actual closure of the roadway section along the heronry during construction is a matter for the City of Anacortes to consider.

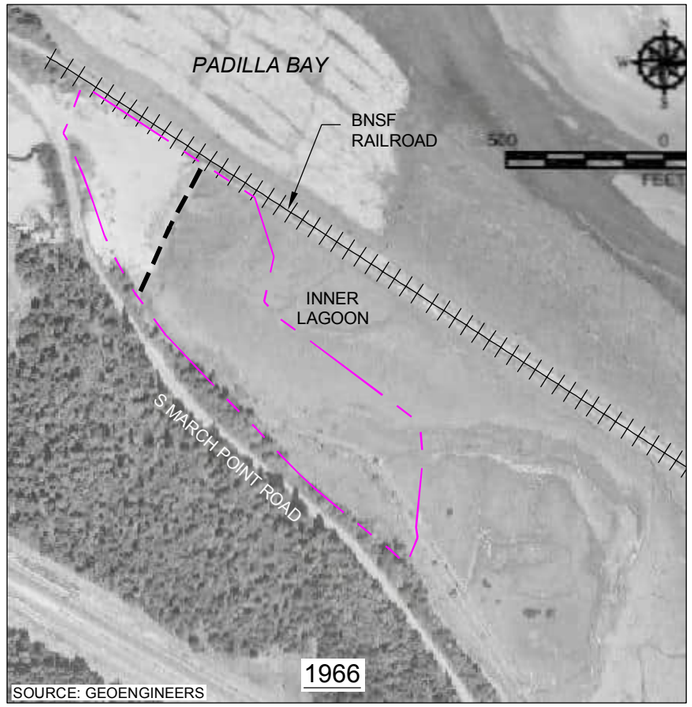
6. *"Wetlands Mitigation"*

Response: Topic of wetlands is outside the scope of the HMP. The project is considered "self-mitigating" by the reviewing agencies by creation of 1.6 acres of new habitat along the shoreline. The project has applied for a JARPA, therefore, additional requirements may be imposed by the agencies, that will be cited in the permit(s) to be issued.

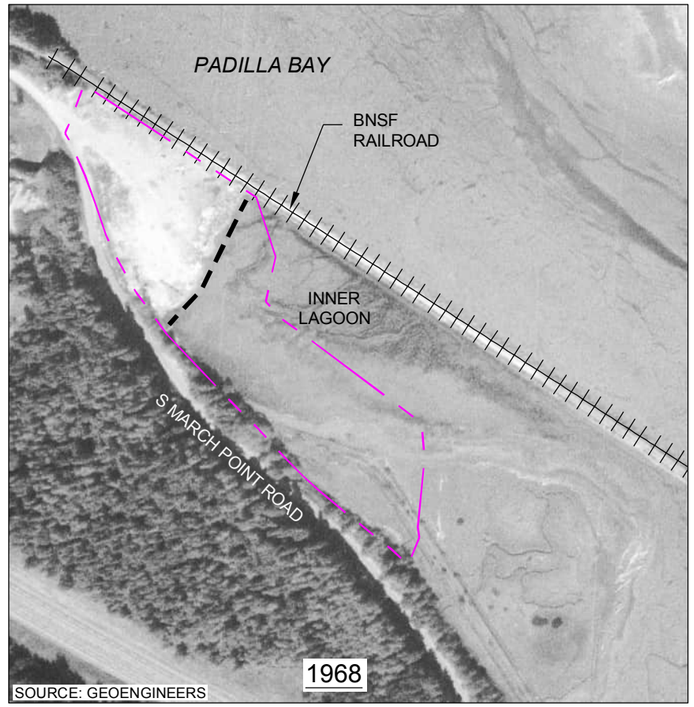
Figures



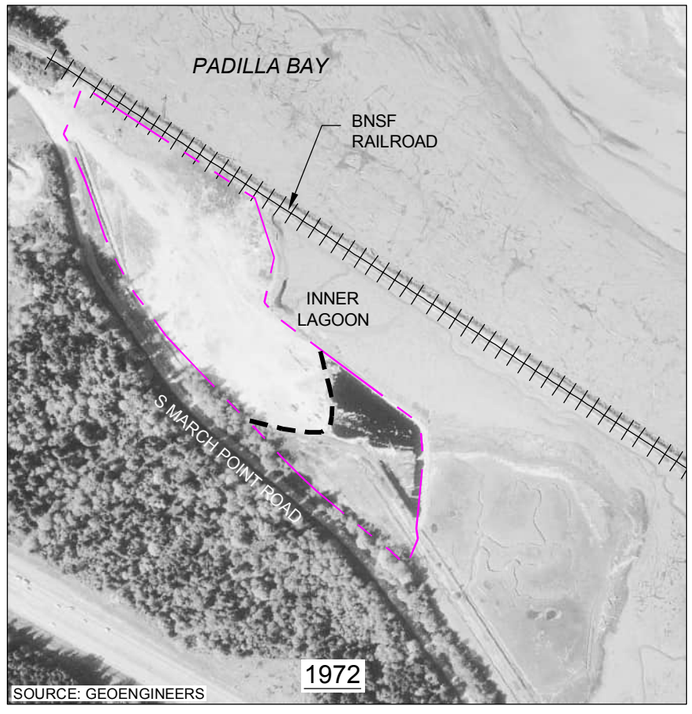
SOURCE: GEOENGINEERS



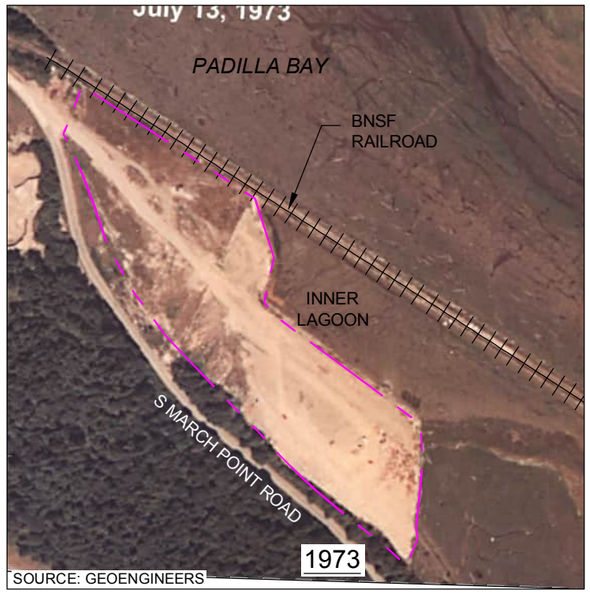
SOURCE: GEOENGINEERS



SOURCE: GEOENGINEERS



SOURCE: GEOENGINEERS



SOURCE: GEOENGINEERS

EXPLANATION

APPROXIMATE FOOTPRINT FORMER WHITMARSH LANDFILL

APPROXIMATE EXTENT OF SOLID WASTE

N

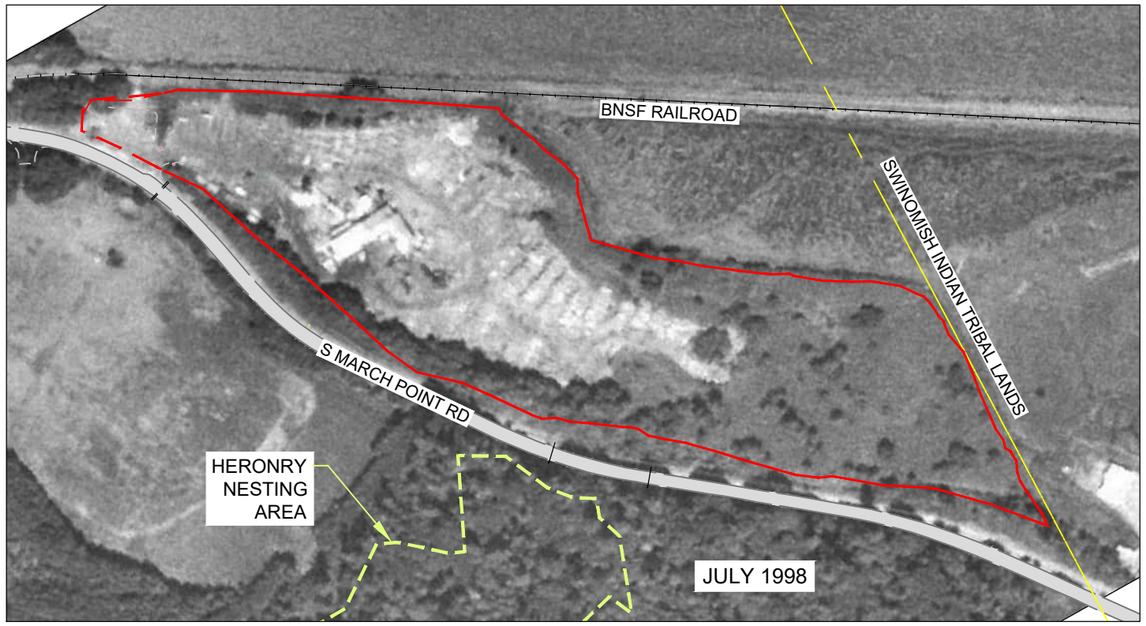
0 250 500

APPROXIMATE SCALE IN FEET

HISTORICAL AERIAL PHOTOGRAPHS SHOWING FILLING OF LANDFILL
March Point (Whitmarsh) Landfill
Skagit County, Washington

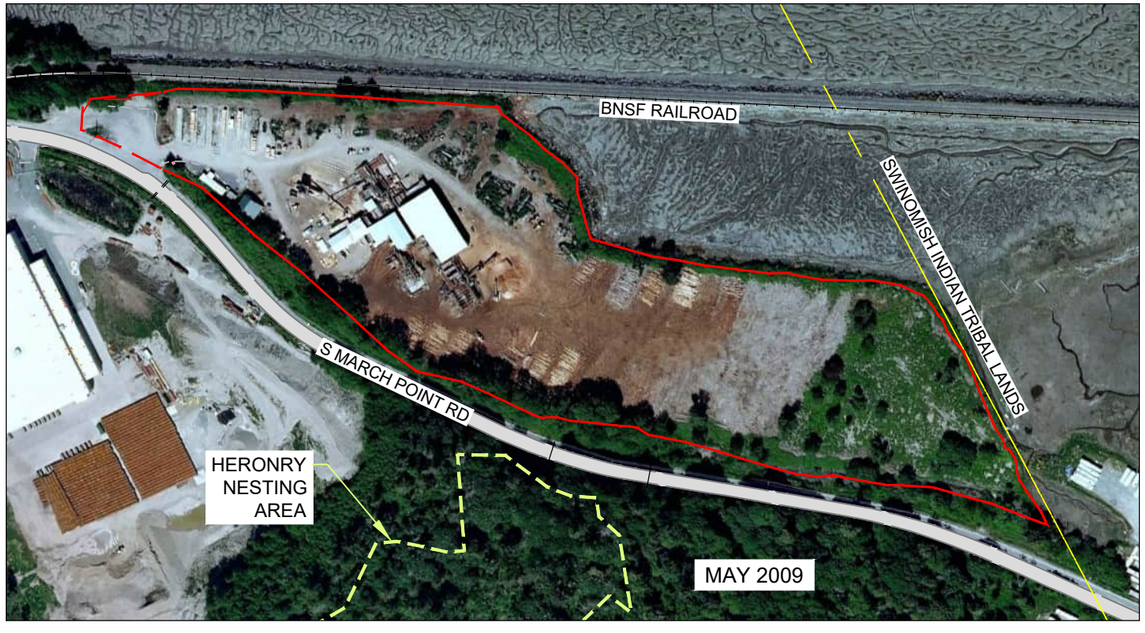
By: APS	Date: 03/03/16	Project No. 14159
amec		Figure A

Plot Date: 03/03/16 - 5:49pm Plotted by: adam.stenberg
Drawing Path: S:\14159\Aerial\Historical\ Drawing Name: Whitmarsh_HistoricalAerials_011411.dwg









EXPLANATION

APPROXIMATE EXTENT OF SOLID WASTE

0 100 200

APPROXIMATE SCALE IN FEET

HISTORIC AERIAL PHOTOGRAPHS
SHOWING SAW MILL OPERATIONS
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 06/22/22	Project No. PS21204410
wood.		Figure B

Plot Date: 06/22/22 - 3:23pm, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_051722_recover.dwg



EXPLANATION

- FORMER SNOW MOUNTAIN LOG MILL
- APPROXIMATE EXTENT OF SOLID WASTE
- PARCEL LINES FROM SKAGIT COUNTY

N

0 200 400
APPROXIMATE SCALE IN FEET

PROJECT LOCATION
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 07/27/22	Project No. PS21204410
wood.		Figure 1

Plot Date: 07/27/22 - 2:15pm, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design-CoverSheet_062322.dwg

PADILLA BAY

BNSF RAILROAD

MAY 15-31, 2023

MAY 1-15, 2023

EXISTING ROADWAY

EXISTING ROADWAY e-Edge

APPROXIMATE EXTENT OF SOLID WASTE

PADILLA BAY
INNER LAGOON

984-FT HABITAT BUFFER

656-FT HABITAT BUFFER

GATE

EXISTING CULVERT

REGRADING:
MAY THROUGH AUGUST
CAPPING:
AUGUST THROUGH SEPTEMBER

JUNE 1-15, 2023

JUNE 15-30, 2023

197-FT HABITAT BUFFER

WATER TREATMENT:
MAY THROUGH SEPTEMBER

GROUNDWATER
EXTRACTION TRENCH

AUGUST 1-15, 2023

JULY 1-15, 2023

JULY 15-31, 2023

NOISE MONITORING SITE: SW

EXISTING CULVERT

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

SWINOMISH INDIAN
TRIBAL LANDS

MONITORING POINTS ALONG PROPERTY LINE

HERONRY
NESTING
AREA

STATE ROUTE 20

EXPLANATION

- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- GROUNDWATER EXTRACTION TRENCH
- ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW) (2-FT INTERVALS) (LIDAR USGS CONTOURS IN 5-FT INTERVALS)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- HERONS BREEDING SEASON
- OUTSIDE HERONS BREADING SEASON

0 75 150
APPROXIMATE SCALE IN FEET

CONSTRUCTION SEQUENCING
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 07/27/22	Project No. PS21204410
wood.		Figure 2

Plot Date: 07/27/22 - 4:00pm Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_Design_071222.dwg

PADILLA BAY

NOISE MONITORING SITE: N

APPROXIMATE EXTENT OF SOLID WASTE

BNSF RAILROAD

PADILLA BAY
INNER LAGOON

EXISTING ROADWAY

EXISTING ROADWAY EDGE

P19713

GATE

P19687

EXISTING CULVERT

P19712

P19676

SWINOMISH INDIAN TRIBAL LANDS

P19761

PARCEL#:
P19677
QUATTRO
PROPERTIES
LLC

PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC

P19684

NOISE MONITORING SITE: SW

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

EXISTING CULVERT

PARCEL#:
P104357
SKAGIT LAND
TRUST

MONITORING POINTS ALONG PROPERTY LINE

P19763

NOISE MONITORING SITE: SE ALTERNATE

PARCEL#:
P135657
SKAGIT
LAND
TRUST

PARCEL#: P19763
SALISH TRUST

HERONRY
NESTING
AREA

PARCEL#:
P19763
SALISH
TRUST

PARCEL#:
P19765
SKAGIT
LAND
TRUST

PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC

STATE ROUTE 20

EXPLANATION

- PARCEL LINE
- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- 20 — ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW) (2-FT INTERVALS) (LIDAR USGS CONTOURS IN 5-FT INTERVALS)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD

NOTE:

1. THE PROPOSED NOISE MONITORING POINTS ARE APPROXIMATE AND MAY CHANGE. ADDITIONAL LOCATIONS MAY ALSO BE CONSIDERED BY WOOD.

0 75 150
APPROXIMATE SCALE IN FEET

NOISE MONITORING LOCATIONS
Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 07/27/22	Project No. PS21204410
wood.		Figure 3

Plot Date: 07/27/22 - 4:15pm Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design_071222.dwg

PADILLA BAY

BNSF RAILROAD

STAGING AREA GENERATOR 5kva

EXISTING ROADWAY

GATE

EXISTING CULVERT

APPROXIMATE EXTENT OF SOLID WASTE

PADILLA BAY INNER LAGOON

984-FT HABITAT BUFFER

656-FT HABITAT BUFFER

197-FT HABITAT BUFFER

DELIVERY TRUCK

DOZER

DUMP TRUCK

TREATMENT AREA WITH PUMPS

GROUNDWATER EXTRACTION TRENCH

SWINOMISH INDIAN TRIBAL LANDS

EXCAVATOR

JULY 15-31, 2023

NOISE MONITORING SITE: SW

EXISTING CULVERT

S MARCH POINT RD

NOISE MONITORING SITE: SE

EXISTING CULVERT

MONITORING POINTS ALONG PROPERTY LINE

HERONRY NESTING AREA

STATE ROUTE 20

NOTE:

FIGURE SHOWS CONSTRUCTION ZONE CLOSEST TO THE HERONRY DURING THE HERONS' BREEDING SEASON.

EXPLANATION

- STORMWATER SWALE CENTERLINE
- EXISTING HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- GROUNDWATER EXTRACTION TRENCH
- ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW) (2-FT INTERVALS) (LIDAR USGS CONTOURS IN 5-FT INTERVALS)
- PROPOSED FINAL GRADE CONTOURS (2-FT)
- EXISTING STRUCTURE
- EXISTING CONCRETE SLAB
- EXISTING CONCRETE PAD
- CONSTRUCTION ZONE

0 75 150

APPROXIMATE SCALE IN FEET

CONSTRUCTION NOISE MODELING LOCATIONS

Heron Management Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 07/27/22	Project No. PS21204410
wood.		Figure 5

Plot Date: 07/27/22 - 4:03pm, Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_Design_071222.dwg

APPENDIX C

CRITICAL AREAS REPORT

City of Anacortes
Critical Areas Assessment Report
Wetland Delineation and Marine OHWM

Whitmarsh Landfill
Anacortes, WA 98221
Skagit County Tax Parcel Numbers
P19676, P19684, P19707, P19713, and P19761

Please note - Critical Areas Report pending revisions to include:
- USACE Data forms for Wetland B
- Ecology Wetland Rating Form supporting figures/maps for Wetland B

Revised version to be provided in the JARPA submittal to Agencies.

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August 2021

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Table of Contents

Statement of Qualifications ..... **v**

Executive Summary ..... **vi**

Chapter 1. Introduction **1**
1.1 Purpose *1*
1.2 Proposed Project *1*
1.3 Project Location *1*

Chapter 2. Methods **3**
2.1 Definitions *3*
2.2 Wetland Identification, Delineation, and Classification *3*
2.3 Regulatory Requirements *4*
2.3.1 City of Anacortes Critical Areas Report (CAMC 17.70.330) 4

Chapter 3. Desktop Review **7**
3.1 Landscape Setting *7*
3.2 Watershed Description *7*
3.3 Soils *7*
3.4 Previously Mapped Wetlands and Streams *8*
3.5 Frequently Flooded Areas *9*
3.6 State Priority Habitat and Species *9*
3.7 Federally Threatened and Endangered Species *10*

Chapter 4. Existing Conditions **11**
4.1 Wetlands *11*
4.1.1 Wetland Unit A 12
4.1.1 Wetland Unit B 13
4.2 Shorelines of Padilla Bay and Inner Lagoon *15*
4.3 Uplands *16*
4.4 Observed Wildlife and Habitat Features *16*

Chapter 5. Analysis of Functions and Values **17**

Chapter 6. Impact Analysis **19**
6.1 Mitigation Sequencing Analysis *19*
6.2 Functional Assessment *19*
6.3 Recommendations to Avoid and/or Minimize Impacts *20*

References **21**

Appendix A – Site Plan and Background Information

Appendix B – Supplementary Figures

Appendix C – Wetland Determination Data Forms

Appendix D – Wetland Rating Forms

Figures

Figure 1. Project Area Location in red, southeast of Anacortes, WA (Google Maps). 2
Figure 2. Mapped NWI surface waters and wetlands and approximate study area boundaries in yellow (USFWS 1996). 9
Figure 3. Study Area Existing Conditions overview (see also Appendix B). 11
Figure 4. Overview of existing conditions of Wetland Unit A. 12
Figure 5. Overview of existing conditions of Wetland Unit B. 14
Figure 6. Overview of existing conditions of the Padilla Bay OHWM (east of railway). 15
Figure 7. Overview of existing conditions of the Inner Lagoon OHWM. 16

Tables

Table 1. Summary of mapped soil type within the approximate study area (Custom Soil Resources Report, USDA, NRCS 2020). 8
Table 2. Summary of WDFW PHS Report for the study area. 10
Table 3. Federally listed T&E species with potential to be in and near the study area. 10
Table 4. Summary of delineated wetlands and streams. 12
Table 5. Summary of wetland indicators in Wetland Unit A (USACE Wetland Determination Data Forms). 13
Table 6. Summary of wetland indicators in Wetland Unit B (USACE Wetland Determination Data Forms). 14

Acronyms and Abbreviations

APN	assessor parcel number
BMP	best management practice
Ecology	Washington State Department of Ecology
FEMA	Federal Emergency Management Agency
FWHCA	fish and wildlife habitat conservation area
GPS	global positioning system
HCA	habitat conservation area
HUC	hydrologic unit code
IPaC	information for planning and consultation
LID	low impact development
NRCS	Natural Resources Conservation Service
NWI	national wetlands inventory
OHWM	ordinary high water mark
PHS	priority habitat and species
RCW	revised code of Washington
SMA	Shoreline Management Act
SMP	Shoreline Master Program
TMDL	total maximum daily load
T&E	threatened and endangered species
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WAC	Washington State Administrative Code
WDNR	Washington Department of Natural Resources
WDFW	Washington State Department of Fish and Wildlife
WRIA	water resource inventory area
WQI	water quality improvement

LIMITATIONS

This report is based upon information collected in the field and obtained from resources provided by Federal, State, and Local agencies. Conclusions are the professional opinion of the authors and are subject to approval by the appropriate agencies.

Statement of Qualifications

Adam Crispin, PWS (#3151), Senior Wetland Scientist and Fisheries Biologist
Adam has more than 10 years of experience conducting biological assessments and evaluations of wetlands and streams working for state agencies, non-profit organizations, and in the private sector as a consultant. Mr. Crispin has a wide range of expertise, including wetland and stream delineation, habitat assessment, population monitoring for amphibians and ESA-listed fish species, water quality monitoring, and stream-bank restoration. He has also led watershed-scale GIS mapping projects in northern California with the California Department of Fish and Wildlife, with a focus on habitat loss, rural agriculture, and summer low-flow hydrologic modeling. Adam has led fish removal operations (e-fishing and seining) for ESA listed species, monitored large dam removal projects, and conducted fish passage evaluations. He has also completed population surveys for salmonids at key life-history stages including juvenile and adult dive surveys, spawner surveys, and redd surveys.

Adam also completes Environmental Assessments (EAs) and Biological Assessments (BAs), for a wide array of freshwater and shoreline projects. Adam has completed a 40-hour wetland delineation training (Wetland Training Institute) and holds certificates for wetland plant and hydric soil identification from Department of Ecology. He is a certified Professional Wetland Scientist (PWS), and forage fish biologist (trained by the Washington Department of Fish and Wildlife). He is currently pursuing a Master's degree in Aquatic Ecology at Western Washington University.

Executive Summary

On July 12, 2021 a Hamer wetland scientist conducted a site assessment of the study area, the Whitmarsh landfill remediation site on Skagit County parcels P19676, P19684, P19707, P19713, and P19761. During the site assessment one wetland (with two wetland units, Unit A and Unit B) and the marine ordinary high watermark were identified and delineated within and outside of the study area. Wetland edges were also flagged; these delineations act as a regulatory boundaries from which critical areas buffers are measured. After reviewing historical aerial images, LiDAR, and using USACE field methodologies, Hamer scientists evaluated potential impacts from the proposed project on wetland and habitat functions and values. This report contains descriptions of the existing conditions of the study area and a preliminary impact assessment of the proposed project. Project design has not yet been finalized, and project impacts and mitigation will be quantified when project design is final. Project proponents will work in tandem with permitting agencies to establish the final design.

Chapter 1. Introduction

1.1 Purpose

The permit applicants, Wood PLC, are proposing a remediation project in the study area, the Whitmarsh Landfill remediation site on Skagit County parcels P19676, P19684, P19707, P19713, and P19761 (Appendix A). A Hamer Environmental (Hamer) wetland scientist conducted a site assessment of the study area on July 12, 2021, which consisted of the entire Whitmarsh landfill remediation, P19676, P19684, P19707, P19713, and P19761. The study area, is within the jurisdiction of the City of Anacortes (City) and subject to City of Anacortes Municipal Code (CAMC) regulations. CAMC regulations require that all applicants for land use development permits, construction permits, or land division comply with the City critical areas ordinance (CAO), Chapter 17.70 of the CAMC. This critical areas assessment report has been prepared to satisfy requirements of the City CAO for wetlands, and fish and wildlife habitat conservation areas (FWHCAs) within the study area.

Information gathered in this report is intended to assist project designers in avoiding and/or minimizing impacts to sensitive areas and species, and to provide information for regulatory reviewers. The report is anticipated to support review by the City, U.S. Army Corps of Engineers (USACE), and/or the Washington State Department of Ecology (Ecology), and Washington State Department of Fish and Wildlife (WDFW).

1.2 Proposed Project

The proposed project is a landfill remediation project for the Whitmarsh Landfill. The primary goal is to cap the contaminated landfill site to avoid potential leaching of contaminated materials into Padilla Bay and the greater Puget Sound. The proposed project would include vegetation removal, excavation, filling and grading, and other actives associated with capping contaminated soils. A landfill cover system will be used and would include placement of a bentonite (synthetic clay) seal, sand, compacted crushed rock, and cover soil. Perforated pipe with approximately 19 gas vents and monitoring wells would also be installed along the proximity of the solid waste and through the center of the site to allow for off-gassing and monitoring. A 15-foot-wide access road would also be installed to allow for site access for maintenance and monitoring. During the construction phase, traffic on South March Point Road is expected to increase throughout the duration of project installation. The construction plan would follow all Ecology and City of Anacortes Best Management Practices (BMPs) and stormwater protocols.

A detailed project background is provided in Appendix A.

1.3 Project Location

The study area is located at 9663 South March Point Rd, Anacortes, Washington and southeast of Anacortes (Figure 1). Study Area GPS coordinates are lat-lon: 48.463758°, -122.530635°. The legal geographic location is Township 34 North, Range 02 East, Section 6.

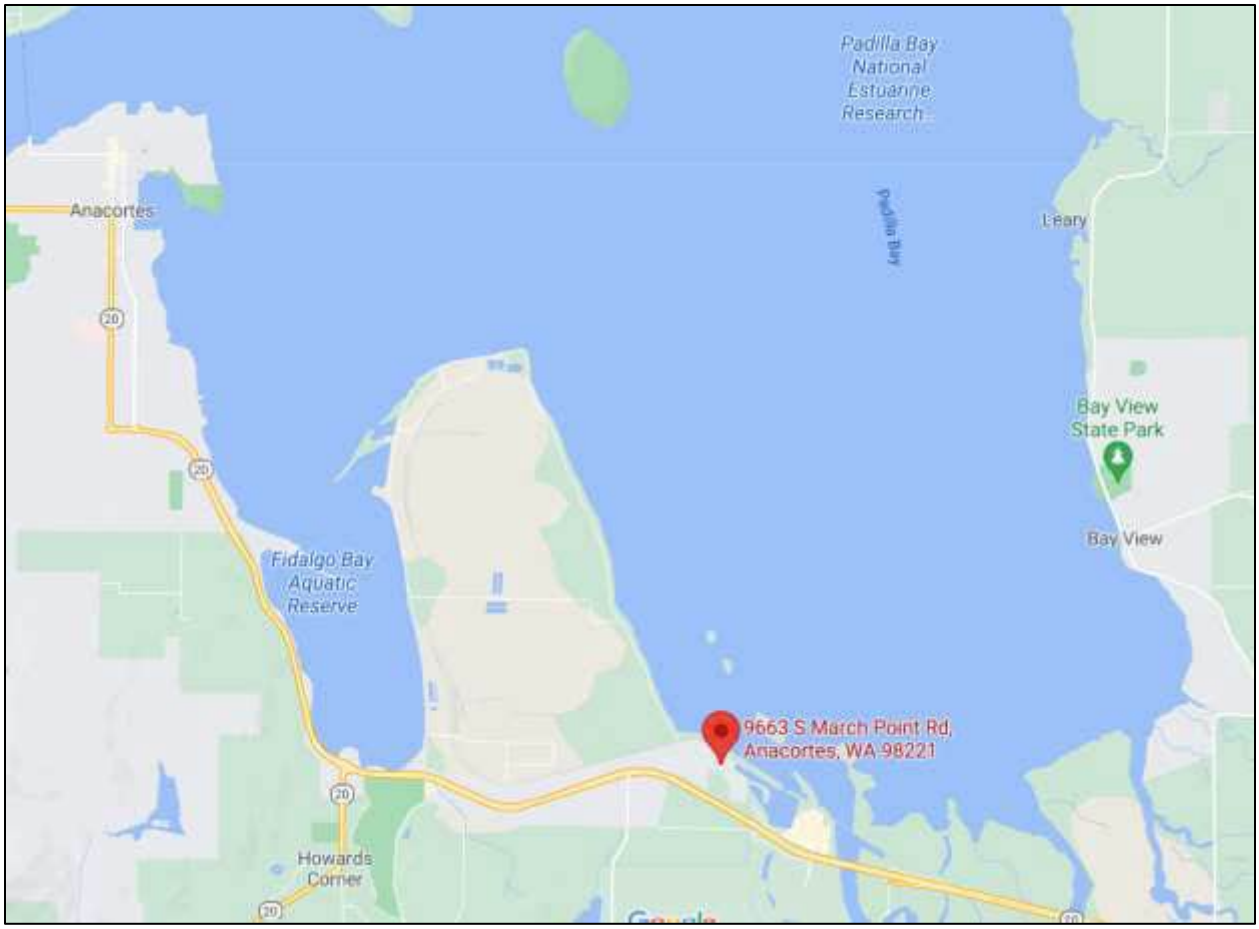


Figure 1. Project Area Location in red, southeast of Anacortes, WA (Google Maps).

Chapter 2. Methods

2.1 Definitions

Wetlands: "Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." (33 CFR, Part 328.3).

Waters of the United States: "All waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; All interstate waters including interstate wetlands; All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce…Wetlands adjacent to waters (other than waters that are themselves wetlands) identified above." (33 CFR, Part 328.3). "Adjacent" is defined as bordering, contiguous, or neighboring.

Limits of jurisdiction in nontidal waters:

- in the absence of adjacent wetlands, the jurisdiction extends to the ordinary high-water mark;
- when adjacent wetlands are present, the jurisdiction extends beyond the ordinary high-water mark to the limit of the adjacent wetlands;
- when the Water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetland (33 CFR, Part 328.3).

Ordinary high water mark: "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." (U.S. Congress 1986).

2.2 Wetland Identification, Delineation, and Classification

Hamer scientists delineate wetlands according to local, state, and federal guidelines. Wetland resources are delineated using guidelines and methods described in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) as amended with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast (Version 2.0)* (USACE 2010). Wetland boundaries are surveyed using a Trimble GEOxt GPS unit.

Scientists use several tools to identify and classify plants and soils examined within the study area. Plant indicator status and scientific plant names are identified using the *National Wetland Plant List: 2014 Update of Wetland Ratings* (Lichvar et al. 2014) and any updates to the *National Wetland Plant List* (USACE 2016). Soil characteristics are recorded and classified using the *Field Book for Describing and Sampling Soils* (USDA, NRCS 2012). Hydric soil conditions are assessed using *Field Indicators of Hydric Soils in the United States, Version 8.1* (USDA, NRCS 2017).

Delineated wetlands are classified according to federal, state, and local systems. The

Classification of Wetlands and Deepwater Habitats of the United States [Federal Geographic Data Committee (FGDC) 2013] is a descriptive classification, based on physical attributes (i.e., plant community, soils, and water regime). Wetlands perform a variety of biological, physical (hydrologic), and chemical (water quality) functions. Wetlands are assigned a hydrogeomorphic (HGM) classification to more accurately assess the functions and values of each wetland. Functions and values for wetlands within the study area are classified under HGM and evaluated using the Washington State Wetland Rating System for Western Washington (Hruby 2014). Ecology divides wetlands into four hierarchical categories based on specific attributes such as rarity, sensitivity to disturbance, and functions (Hruby 2014). The Ecology classification hierarchy ranges from Category I wetlands, which exhibit outstanding features (rare wetland type, relatively undisturbed or a high sensitivity to disturbance, and high level of functions) to Category IV wetlands, which have the lowest levels of function and are often heavily disturbed.

Wetland buffer widths are assigned according to CAMC section 17.70. These standard buffer widths are based on the combination of wetland rating category, the habitat function score from the wetland rating form, and land use intensity. Levels of land use intensity are defined in Article 9 of the CAO. Additional building setback requirements from critical area buffers can be found in CAMC 17.70.

2.3 Regulatory Requirements

2.3.1 City of Anacortes Critical Areas Report (CAMC 17.70.330)

Critical area reports for wetlands must meet the requirements of this section. Critical area reports for two or more types of critical areas must meet the report requirements for each relevant type of critical area.

A. Preparation by a Qualified Professional. A critical area report for wetlands shall be prepared by a professional wetland scientist.

B. Area Addressed in Critical Area Report. The following areas shall be addressed in a critical area report for wetlands:

1. The project area of the proposed activity;

2. All wetlands and recommended buffers within three hundred feet of the project area. Critical area reports should consider wetlands and other critical areas within three hundred feet due to the maximum potential buffer size for wetlands. Critical area size and characteristics beyond the project area may be estimated through aerial photographic interpretation and discussions with agency staff if the adjacent property owner denies access; and

3. All shoreline areas, water features, floodplains, and other critical areas, and related buffers within three hundred feet of the project area.

C. Wetland Analysis. A critical area report for wetlands shall contain an analysis of the wetlands including the following site- and proposal-related information at a minimum:

1. A written assessment and accompanying maps of the wetlands and buffers within three hundred feet of the project area, including the following information at a minimum:

a. Wetland delineation and required buffers,

b. Existing wetland acreage,

c. Wetland category,

d. Vegetative, faunal, and hydrologic characteristics,

e. Soil and substrate conditions,

f. Topographic elevations, at two-foot or five-foot contours (as determined by the administrator), and

g. A discussion of the water sources supplying the wetland along with documentation of hydrologic regime (locations of inlet and outlet features, water depths throughout the wetland, evidence of recharge or discharge, evidence of water depths throughout the year—drift lines, algal layers, moss lines, and sediment deposits);

2. A discussion of measures, including avoidance, minimization, and mitigation, proposed to preserve existing wetlands and restore any wetlands that were degraded prior to the current proposed land use activity;

3. A habitat and native vegetation conservation strategy that addresses methods to protect and enhance on-site habitat and wetland functions;

4. Functional evaluation for the wetland and adjacent buffer using a local or state agency staff-recognized method and including the reference of the method and all data sheets;

5. Proposed mitigation, if needed, including a written assessment and accompanying maps of the mitigation area, including the following information at a minimum:

a. Existing and proposed wetland acreage,

b. Vegetative and faunal conditions,

c. Surface and subsurface hydrologic conditions including an analysis of existing and future hydrologic regime and proposed hydrologic regime for enhanced, created, or restored mitigation areas,

d. Relationship within watershed and to existing waterbodies,

e. Soil and substrate conditions, topographic elevations,

f. Existing and proposed adjacent site conditions,

g. Required wetland buffers (including any buffer reduction and mitigation proposed to increase the plant densities, remove weedy vegetation, and replant the buffers),

h. Property ownership,

i. Associated wetlands and related wetlands that may be greater than three hundred feet from the subject project,

j. A map drawn to a scale appropriate to show relevant features and information of the development proposal site and adjacent area,

k. A discussion of ongoing management practices that will protect wetlands after the project site has been developed; including proposed monitoring and maintenance programs;

6. A bond estimate for the installation (including site preparation, plant materials and installation, fertilizers, mulch, stakes) and the proposed monitoring and maintenance work for a minimum of five years.

Chapter 3. Desktop Review

Prior to conducting fieldwork, Hamer scientists conducted a desktop review of the study area and vicinity. Information was gathered from local, state, and federal sources to obtain a comprehensive view of the area's natural resources and ecological processes. The following publicly available databases were reviewed:

- City of Anacortes GIS maps (City of Anacortes 2020)
- Skagit County iMap (Skagit 2021)
- Washington State Water Quality Atlas (Ecology 2020)
- U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 1996)
- Washington State Department of Natural Resources (WDNR) Wetlands of High Conservation Value (WDNR 2020)
- WDNR Forest Practices Application Mapping Tool (WDNR 2020)
- Federal Emergency Management Agency (FEMA) Flood Map Service Center (FEMA 2020)
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA, NRCS 2020)
- WDFW Priority Habitat and Species (PHS) on the Web (WDFW 2020)
- USFWS Information for Planning and Consulting (IPaC) (USFWS 2020)

3.1 Landscape Setting

The study area lies in the Puget Lowlands where most areas are either gently sloped or flat. The study area is within the Frontal Padilla Bay Watershed on land that zoned for "heavy manufacturing" use.

3.2 Watershed Description

The study area is within Water Resource Inventory Area (WRIA) 3, the Lower Skagit-Samish, and the Fidalgo Island-Frontal Padilla Bay sub-watershed, HUC 171100020303 (Ecology 2020). The watershed has two water quality improvement (WQI) projects in development, the Padilla Bay Bacteria Total Maximum Daily Load (TMDL) and the Puget Sound Nutrient Source Reduction Project, for high levels of total phosphorous, bacteria, and dissolved oxygen (Ecology 1998).

A water quality map is shown in Appendix B (Figure B-1).

3.3 Soils

The local soil survey identifies one soil types within the approximate study area boundaries. Table 1 summarizes the NRCS custom soil resource report for the study area (USDA, NRCS. 2020). The soil map for the approximate study area boundaries is attached in Appendix B (Figure B-2). The soil type indicated was rated as hydric.

Table 1. Summary of mapped soil type within the approximate study area (Custom Soil Resources Report, USDA, NRCS 2020).

Map Unit	Map Unit Name	Hydric Soil	Typical Profile	Properties
72	Hydraquents, tidal	Yes	0 to 7 inches: ashy loam 7 to 17 inches: very gravelly ashy loam 17 to 31 inches: clay loam 31 to 60 inches: silty clay	Landform: Hillslopes, terraces Parent material: Volcanic ash, glaciolacustrine deposits, and glacial drift About zero inches to water table. High available water storage in profile.

3.4 Previously Mapped Wetlands and Streams

The USFWS NWI maps estuarine and marine wetlands that show the historic extent of wetlands of the Whitmarsh Landfill (Figure 2). The NWI map also shows the very large contiguous wetlands and mudflats associated with the Swinomish Channel and permanently flooded deepwater habitat with an unconsolidated bottom. The WDNR Natural Heritage Information System has no records of rare plants, high quality wetlands or ecosystems within the study area (WDNR 2020b).

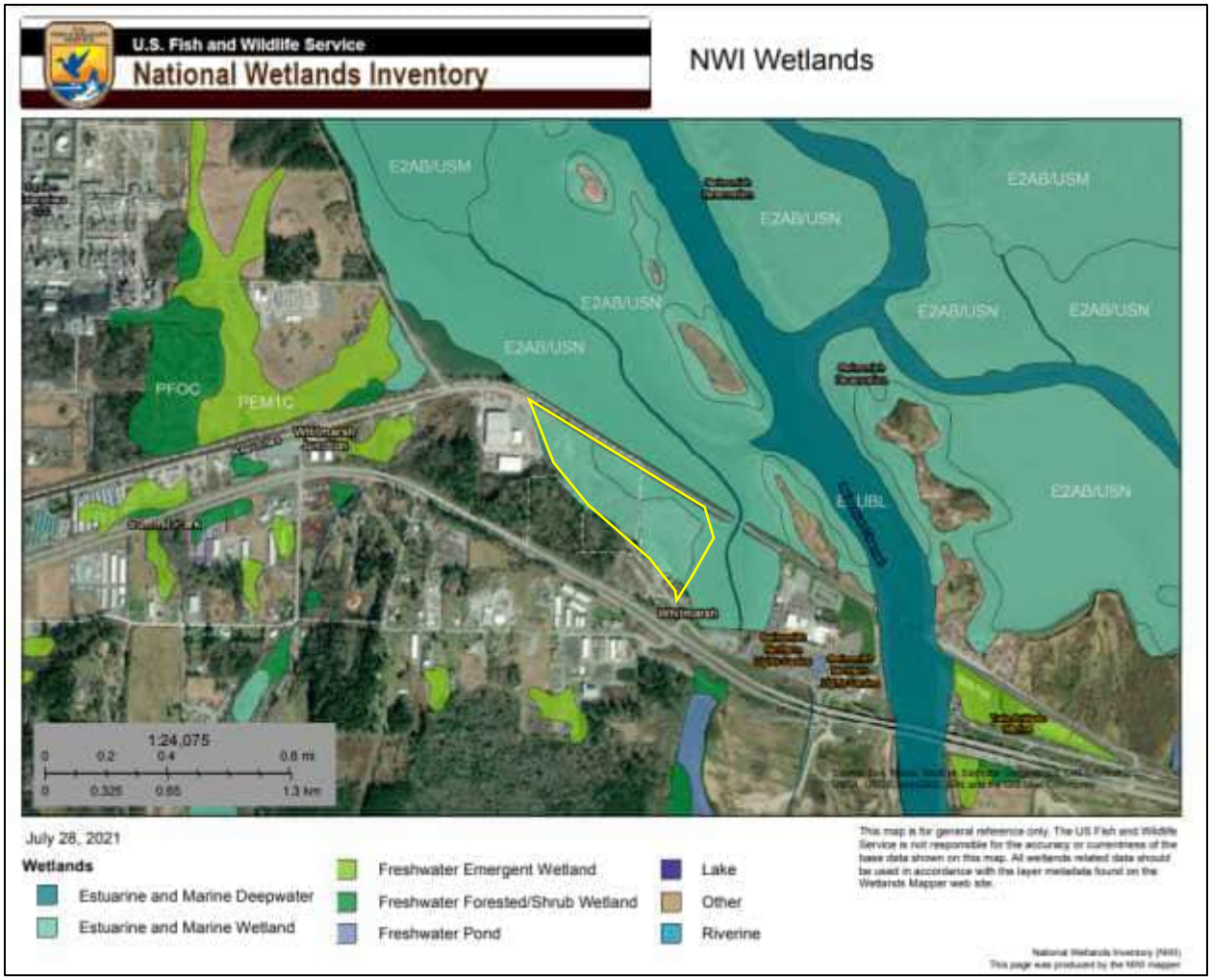


Figure 2. Mapped NWI surface waters and wetlands and approximate study area boundaries in yellow (USFWS 1996).

3.5 Frequently Flooded Areas

FEMA Flood Map Service Center maps the study area within Flood Zone V4 with a base flood elevation of 9 feet (FEMA 2020).

3.6 State Priority Habitat and Species

WDFW manages state PHS and document the following PHS to have the potential to occur within the study area (WDFW 2020a). Table 2 summarizes the PHS report for the study area, these include.

Table 2. Summary of WDFW PHS Report for the study area.

Common Name	Scientific/ Technical Name	Washington State Listing Status	Priority Area
Mammals			
Big brown bat	*Eptesicus fuscus*	PHS Listed Occurrence	N/A
Little Brown Bat	*Myotis lucifugus*	PHS Listed Occurrence	N/A
Habitat			
Estuarine and Marine Wetland	N/A	PHS Listed Occurrence	Aquatic Habitat
Waterfowl and Shorebird Concentrations	N/A	PHS Listed Occurrence	Regular Concentration

Source: Washington Department of Fish and Wildlife (WDFW 2020) PHS on the Web.

3.7 Federally Threatened and Endangered Species

Listed T&E species under the Endangered Species Act (ESA) and their critical habitat are managed by USFWS and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA). Table 3 summarizes the species listed by USFWS as potentially affected by activates within the study area. According to USFWS, Bull Trout (*Salvelinus confluentus*) critical habitat exists within the study area and larger Puget Sound (USFWS 2020).

Table 3. Federally listed T&E species with potential to be in and near the study area.

Common Name	Scientific Name	ESA Status	Jurisdiction	Critical Habitat within Study Area?
Fishes				
Bull Trout	*Salvelinus confluentus*	Threatened	USFWS	Yes, Critical Habitat includes Puget Sound
Dolly Varden	*Salvelinus malma*	PSAT	USFWS	No critical habitat designated
Mammals				
Gray Wolf	*Canis lupus*	Endangered	USFWS	No critical habitat designated
Birds				
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	USFWS	No
Streaked Horned Lark	*Eremophila alpestris strigata*	Threatened	USFWS	No
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	USFWS	No
Plants				
Golden Paintbrush	*Castilleja levisecta*	Threatened	USFWS	No critical habitat designated

Source: U.S. Fish & Wildlife Service (USFWS 2020) IPaC.

Chapter 4. Existing Conditions

Hamer scientists conducted a site assessment of the study area on May 3, 2021. During the site visit one wetland, with two wetland units, was assessed outside of the study area boundaries. Figure 3 is an overview of the study area existing conditions (Appendix B). Site wetlands were delineated per USACE methodologies.



Figure 3. Study Area Existing Conditions overview (see also Appendix B).

4.1 Wetlands

One wetland with two wetland units, Wetland Unit A and Wetland Unit B, was delineated within and outside of study area boundaries. Wetland boundaries were determined where indicators for hydrophytic vegetation, hydric soils, and wetland hydrology were present. USACE wetland determination data forms were completed with field observations from four sample plots within the study area (Appendix C). Two upland test pits were logged adjacent to the wetland test pit in an area where wetland indicators were generally absent. The wetland categories were determined using the current Ecology rating system (Hruby 2014) (Appendix D). Wetland buffers were determined based on the protection standards of the County regulations.

Table 4 summarizes the characteristics of wetlands and critical areas.

Table 4. Summary of delineated wetlands and streams.

Critical Area	Wetland Classification			Size (acres)	Habitat Score	Land Use Intensity	Proposed Buffer Width (ft)
	FGDC[1]	HGM	Type or Category[2]				
Wetland Unit A	E2EM1/USN	Estuarine	I	42.9[3]	n/a	Moderate	225
Wetland Unit B	PEM/PSS/PFO	Depressional	II	0.85	7	Moderate	110
Padilla Bay Shoreline	n/a	n/a	Shoreline of the State	n/a	n/a	Moderate	100

[1]FGDC (formerly Cowardin) or NWI Class based on vegetation: E=estuarine, 2=intertidal subsystem, EM=emergent, 1= subclass persistent, US=unconsolidated shore, N=regularly flooded.
[2] Wetlands rated according to Ecology (Hruby 2014) and City of Anacortes Critical Areas Ordinance.
[3]Boundaries of wetland were not delineated to their full extent, wetland size is an estimate based on field observations, aerial imagery, and LiDAR. Wetland unit was separated from the larger estuarine wetland complex at the rail road bridge spanning the estuary.

4.1.1 Wetland Unit A

Wetland Unit A is estuarine and receives surface water from Padilla Bay and upslope freshwater areas, including stormwater from South March Point Road (Figure 4).



Figure 4. Overview of existing conditions of Wetland Unit A.

Vegetation within Wetland Unit A is dominated by herbaceous saltmarsh species such as saltmarsh bulrush (*Schoenoplectus maritimus*) and seaside arrowgrass (*Triglochin maritima*) and there are large mudflat areas that contain no vegetation. Soils are highly organic and have a mucky consistency in upper layers. Stormwater from South March Point Road, culverts, and the linear ditch-wetland portion of Wetland Unit A (Figure 3, Table 5) each appear to convey surface water to the wetland during wet periods. The ditch-wetland portion of Wetland Unit A was largely unvegetated in lower sections (near the connection to the estuary).

Table 5. Summary of wetland indicators in Wetland Unit A (USACE Wetland Determination Data Forms).

Dominant Vegetation [1]	Soils	Hydrology
saltmarsh bulrush (*Schoenoplectus maritimus*) OBL seaside arrowgrass (*Triglochin maritima*) OBL	Depleted Matrix (F3)	Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Algal Mat or Crust (B4) Iron Deposits (B5) Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

[1] OBL=Obligate

According to the current Ecology (2014) guidance, the wetland rating system *cannot* be used to score functions for estuarine wetlands with a salinity greater than 0.5 parts per thousand (ppt). Ecology's rating system can however, be used to rate the wetland based on special characteristics. Salinity measurements were not collected; however, the wetland unit is tidally connected to the Swinomish Channel and Padilla Bay mud flats which have a salinity of 28.5 ppt., which is likely the approximate salinity of the wetland unit. Unit A was determined to be Category I based on special characteristics (Appendix D). According to the CAMC, Category I wetlands with a high level of habitat function (as determined by Ecology's habitat functional score) would require a *225-ft buffer*. Although Unit A's habitat functions could not be scored using the rating form, they are likely high due to connectivity to high quality protected aquatic habitats in and around the Padilla Bay Aquatic Reserve.

4.1.1 Wetland Unit B

Wetland Unit B appears to be primarily influenced by freshwater inputs, as determined by observed freshwater vegetation, such as skunk cabbage (*Symplocarpus foetidus*), and historic salinity measurements (Appendix B). There was evidence of unidirectional flow in areas where surface water was observed (Figure 5). The unit was rated separately from Wetland Unit A given its different hydrologic regime and vegetation. Lower sections of the ditch did appear to be tidally influenced and contained salt-tolerant species; however, freshwater species gradually become dominant in the norther sections of the ditch. The unit "break" was determined where skunk cabbage was first observed.



Figure 5. Overview of existing conditions of Wetland Unit B.

Vegetation within Wetland Unit B is dominated by facultative and obligate species such as red alder (*Alnus rubra*), cattail (*Typha sp.*), and skunk cabbage**,** along the linear ditch-channel. Soils are organic in upper layers containing redox depletions below six inches. Stormwater from South March Point Road, culverts, and the landfill site, and each appear to convey surface water to the wetland during wet periods (Table 6).

Table 6. Summary of wetland indicators in Wetland Unit B (USACE Wetland Determination Data Forms).

Dominant Vegetation [1]	Soils	Hydrology
red alder (*Alnus rubra*) salmonberry (*Rubus spectabilis*) cattail (*Typha sp.*) skunk cabbage (*Symplocarpus foetidus*)	Depleted Matrix (F3)	Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Iron Deposits (B5) Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

[1] OBL=Obligate

Using the current Ecology (2014) wetland rating system the wetland was rated based on functions (Appendix D). The wetland was determined to be Category II with a moderate habitat score of 7. According to the CAMC, Category II wetlands with a moderate level of habitat function (as determined by Ecology's habitat functional score) would require a 110-ft buffer.

4.2 Shorelines of Padilla Bay and Inner Lagoon

The Padilla shoreline adjacent to the study area was evaluated onsite and the OHWM was determined in conjunction with available information (including LiDAR topographical images and WDNR shoreline data). The shoreline is armored and composed of large boulders that make up the BNSF railway, or is contiguous with the wetland boundary (Figure 3). Padilla Bay is a shoreline of the state, and the study area is within the 200-foot shoreline jurisdiction according to the delineated OHWM. Indicators of the OHWM were prevalent and obvious; they included water marks, persistent salt-tolerant vegetation, and presence of marine lichens (Figure 6).



Figure 6. Overview of existing conditions of the Padilla Bay OHWM (east of railway).

Within the inner lagoon, indicators of the OHWM were consistent with the estuarine wetland they included water marks, persistent salt-tolerant vegetation, marine algae, and staining of iron rich sediment (Figure 7). The boundary of the marine OHWM was delineated east of the ditch-wetland area where marine waters were observed to be the dominant source of hydrology.



Figure 7. Overview of existing conditions of the Inner Lagoon OHWM.

4.3 Uplands

The study area and its vicinity appear to have been significantly modified by the installation of paved roads, the BNSF railway, and industrial practices, including the adjacent March Point Refinery. Undeveloped forested areas in the vicinity are mixed coniferous-deciduous where Western red cedar (*Thuja plicata*), Douglas fir (*Psuedotsuga menziesii*), and big-leaf maple (*Acer macrophyllum*) are the dominate tree species. Shrub vegetation is composed of salmonberry (*Rubus spectabilis*) and Himalayan blackberry (*Rubus armeniacus).* The dominant emergent vegetation is swordfern (*Polystichum munitum*). Upland soils in the study area are composed of well drained silt loam and sandy silt loam with high chroma matrices (Appendix C).

4.4 Observed Wildlife and Habitat Features

March Point Heronry is in the proximity to the Whitmarsh Landfill. A Heron Management Plan would be created in conjunction with the project.

A variety of songbirds were observed during the field investigation. Wildlife expected within the area include black-tailed deer (*Odocoileus hemionus*), a variety of shrews, chipmunks, mice, voles, owls, raptors, falcons, and songbirds. All wetlands are likely to provide habitat for invertebrates: insects, spiders, and freshwater gastropod mollusks.

Chapter 5. Analysis of Functions and Values

One Category I wetland unit, requiring a 225-ft protective buffer, and one Category II wetland unit, requiring a 110-ft protective buffer, were delineated within the study area. The wetlands currently provide high levels of hydrologic, water quality, and habitat function based on professional opinion and according to the rating summary (Appendix D). The following functions were separated by the two distinct wetland areas, the estuarine (inner lagoon, Unit A) portion and the linear ditch-wetland (Unit B) at the southern boundary of the study area.

Important habitat, hydrologic, and water quality functions that are provided by the **estuarine Wetland Unit A** include:

- Large marine drift woody debris that provide refugia and prey recruitment;
- Emergent marine vegetation for marine birds nesting;
- Breeding areas, escape, refugia, and food production for a variety of species (Hruby 2014).
- Trapping, removing, and filtering pollutants from stormwater runoff;
- Water storage, which helps prevent flooding.

Important habitat, hydrologic, and water quality functions that are provided by the **ditch Wetland Unit B** include:

- Large downed woody debris that provide refugia and prey recruitment;
- Trees, shrubs, and emergent vegetation for bird nesting and refugia;
- Breeding areas, escape, refugia, and food production for a variety of species (Hruby 2014).
- Trapping, removing, and filtering pollutants from stormwater runoff;
- Slowing the flow of surface water during large storm events, reducing flooding and erosion;
- Water storage, which helps prevent flooding.

The exiting habitat buffer within the study area is largely made up of the landfill remediation site which is composed of fill material of various sizes, Himalayan blackberry, and some large trees including red alder, and big-leaf maple. These soils have been contaminated by historic landfill operations and have allowed for potential leaching of contaminated materials into Padilla Bay and Puget Sound. Some vegetation would need to be removed in order to cap the landfill site; however, this vegetation is largely composed of invasive Himalayan blackberry, and the ecological benefits of capping the contaminated site clearly outweigh removal of onsite vegetation. Approximately 1.6 acres of shrub habitat would be created as part of the remediation project.

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Chapter 6. Impact Analysis

Hamer scientists used information gathered from the desktop review, field observations, and information obtained from project designers to analyze potential effects of the proposed project, and cumulative effects, on shoreline ecological functions and critical areas. This chapter includes recommendations on how adverse environmental impacts can be avoided and/or minimized during and after development of the proposed project. Project design has not yet been finalized, and project impacts and mitigation will be quantified when project design is final. Project proponents will work in tandem with permitting agencies to establish the final design.

6.1 Mitigation Sequencing Analysis

The mitigation sequencing process is a series of steps that are required to be followed to avoid and minimize impacts to critical areas and their buffers wherever practicable. The following analysis of the mitigation sequencing steps was completed for the proposed project.

Avoiding the impact

The proposed project proposes to remove the riprap at the wetland/shoreline and in and around the ditch wetland, therefore wetland and buffer impacts cannot be avoided to meet the project purpose and need. There would be excavation, vegetation removal, filling and grading within the buffer, and increased traffic during construction.

Minimizing the impact

The proposed project is designed to avoid and minimize impacts to critical areas and their associated buffers to the extent feasible. Work below OHWM would be completed during low tides to avoid in-water work and minimize turbidity in the water column and indirect effects to species and habitats in the vicinity.

Rectifying the impact

Vegetated buffer areas would be impacted by construction during the capping phase of the remediation project; however, ultimately the area would be restored or enhanced to benefit ecological and water quality conditions in Padilla Bay. Plantings would also be installed to strengthen habitat and water quality functions.

Reducing or eliminating the impact over time

Using BMPs and Low Impact Design (LID) elements would reduce potential adverse impacts over the life of the project. The cleanup project is also expected to significantly reduce leachate seepage to surface water and groundwater, control venting, and limit sedimentation into Padilla Bay due to uncontrolled surface water drainage (Appendix A).

Compensating for the impact

The project proposes to compensate for project impacts by installing 1.6 acres of native shrubs.

6.2 Functional Assessment

The functions of the existing conditions in the study area and adjacent areas were evaluated based on best professional judgment, ecological knowledge of the site, and the City of Anacortes CAO.

6.2.1 Functions of Onsite Areas to be Impacted

The onsite conditions in the wetland buffer resemble a recently overgrown historic industrial

area. Until approximately 2010, the northern two-thirds of the Site was occupied by a cedar log sawmill, which had operated in this location since the 1980s. The former mill area currently contains building foundation concrete slabs, partially dismantled buildings, and an intact shop building (Appendix A). As observed during the July site visit, most of the central area has been cleared, and is composed of contaminated fill materials under approximately 18 inches of topsoil; however, there is some canopy cover along the southern edge of the study area (near South March Point Road) and the southeastern quarter of the study area. These areas (composed of predominantly Himalayan blackberry and a few trees) likely provide habitat for many common wildlife species. Due to the Site's proximity and potential impacts to Padilla Bay and the inner lagoon, it was identified by Ecology as a high priority cleanup area under the Puget Sound Initiative (Appendix A).

6.2.2 Functions of the Proposed Mitigation Area

The existing riprap would be removed from the shoreline and the shoreline slope will be flattened and the area would be covered with a multi-layer cap system. The upper 18 inches of the cap system will be of suitable soil to facilitate development of vegetative communities. The selected vegetation would include a variety of native shrubs. Approximately 1.6 acres of habitat will be created upon completion of the project, providing high quality habitat for area species. Trees will not be planted due to their tendency to have root systems that could penetrate the cover soils and possibly damage the cap system. A temporary watering system will be installed to provide supplemental water for the plantings (Appendix A).

6.3 Recommendations to Avoid and/or Minimize Impacts

All new development and redevelopment must conform to the standards and minimum requirements set by the Ecology Stormwater Management Manual (SMM) for Western Washington. The proposed project is required to control erosion and sediment during construction and to permanently stabilize soil exposed during construction. According to Ecology, all new development and redevelopment projects are responsible for preventing erosion and discharge of sediment and other pollutants into receiving waters. Projects must consider all Construction Stormwater Pollution Prevention Plan (SWPPP) Elements listed in the SMM that pertain to the project site. Recommended BMPs include (Ecology 2019):

- Preserving natural vegetation where possible;
- Creating a buffer of natural vegetation;
- Construct silt fencing, wattles, and brush barriers;
- Apply temporary and permanent seeding; and
- Apply topsoil/composting and mulching.

The proposed project would decrease the amount of impervious surface within the study area. The cleanup project is expected to significantly reduce leachate seepage to surface water and groundwater, venting, and limit sedimentation into Padilla Bay due to uncontrolled surface water drainage (Appendix A). Surface runoff from the site will all be captured by the installed stormwater control measures and the constructed surface drainage system on and around the landfill. Project specific stormwater design elements may include:

- Tree retention and planting of native species;
- Minimized area of impermeable surfaces.
- Surface drainage system on and around the landfill will capture surface runoff from the site

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Appendix A – Site Plan and Background Information

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PADILLA BAY

BNSF RAILROAD

A
FIG-34

B
FIG-34

C
FIG-34

EXTENT OF SOLID WASTE

PADILLA BAY
INNER LAGOON

EXISTING OHWM (EL. 9.24')

POST-REMEDIATION OHWM (EL. 9.24')

GCLL/POLYMER OVERLAP (EL. 15.8')

ACCESS ROAD
(15' WIDE)

S MARCH POINT ROAD

EXTENT OF SOLID WASTE

Aerial Photo Courtesy of Google Earth
(May, 2015)

N

0 60 120
APPROXIMATE SCALE IN FEET

EXPLANATION

WELL PAIR LOCATION
LOCATION AND NUMBER OF WELLS SHOWN ARE TENTATIVE.

GAS VENT LOCATION

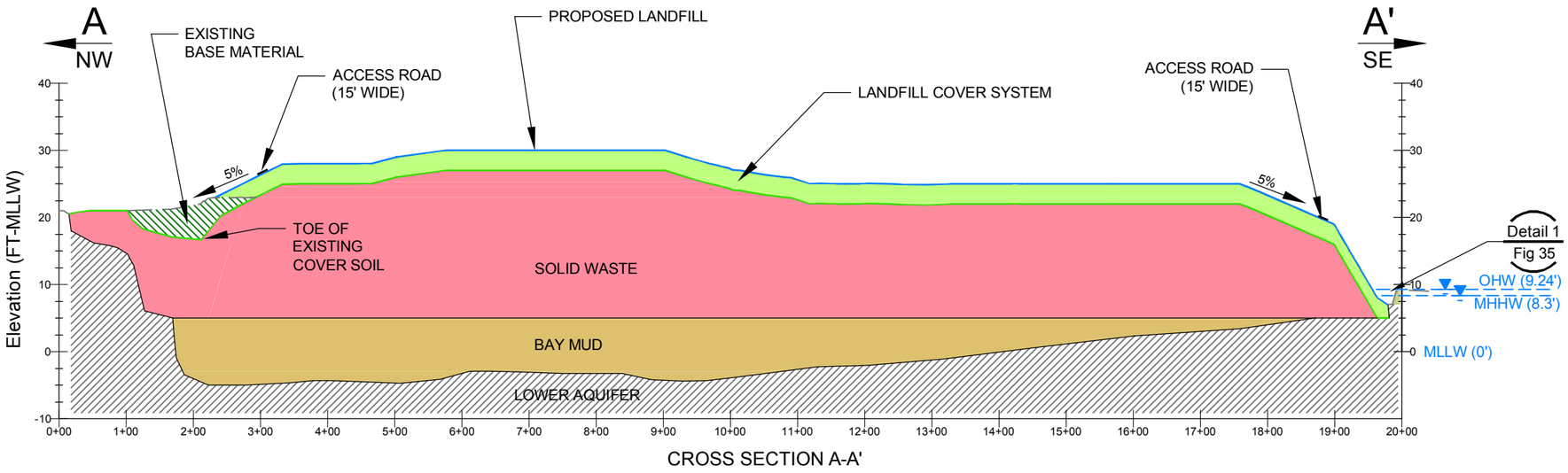
GAS VENT LINE

25 ELEVATION CONTOUR IN FEET ABOVE
MEAN LOWER LOW WATER

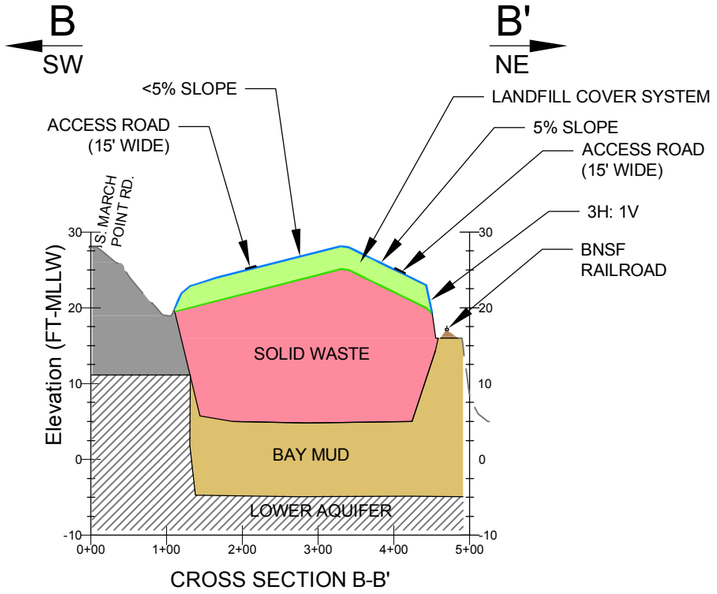
PLAN VIEW
ALTERNATIVE 3
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 03/04/16	Project No. 14159
amec		Figure 33

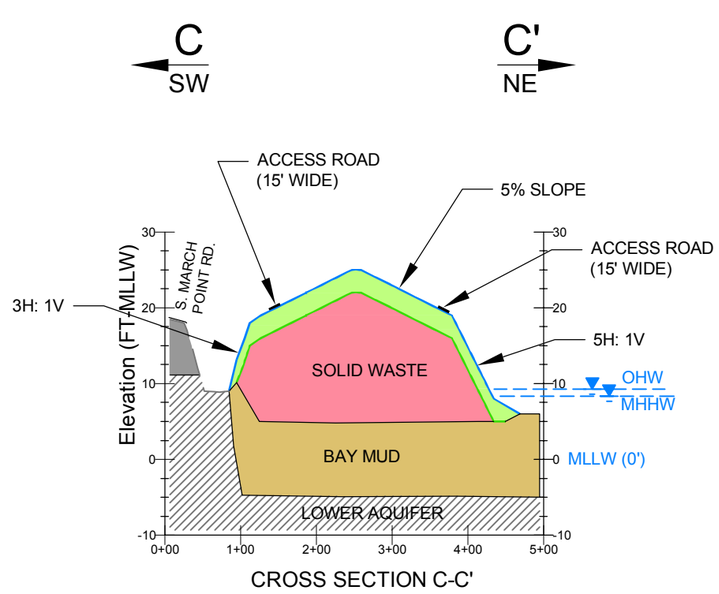
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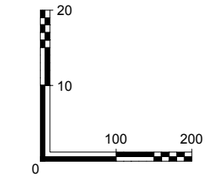
CROSS SECTION A-A'



CROSS SECTION B-B'



CROSS SECTION C-C'



APPROXIMATE SCALE IN FEET
VERTICAL EXAGGERATION = 10X

KEY

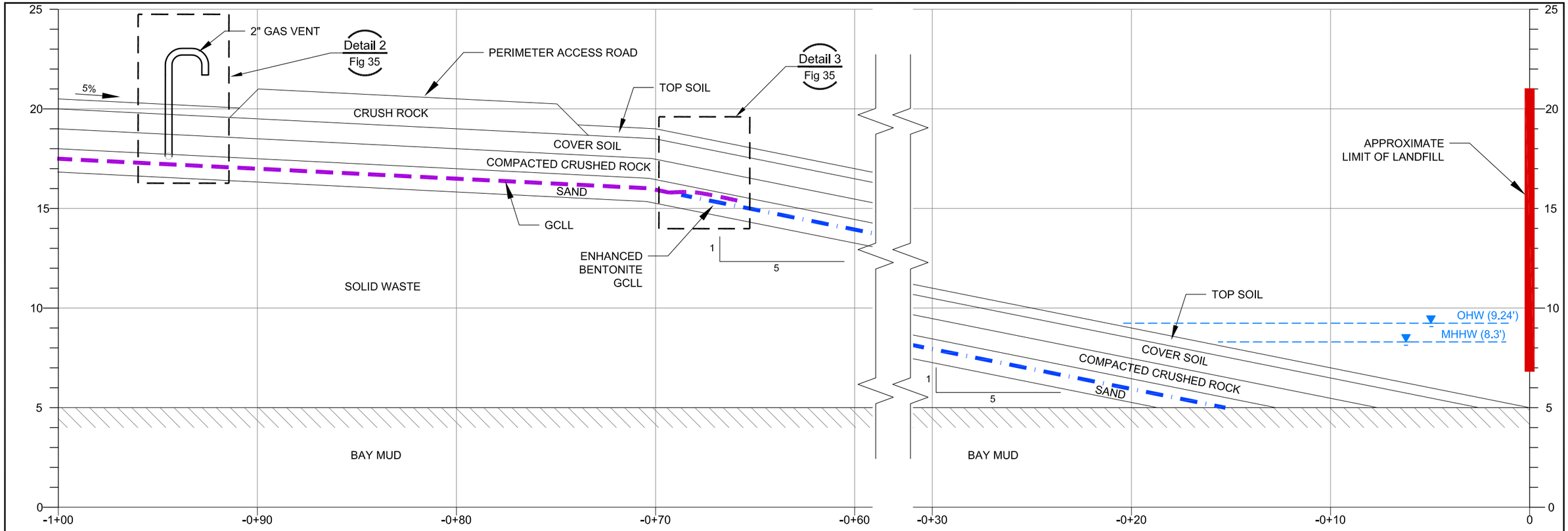
- BASE MATERIAL
- SOLID WASTE
- LEAN CLAY TO SILT (CL-ML) (BAY MUD)
- POORLY GRADED SAND TO WELL-GRADED SAND WITH GRAVEL (SP-SW) (Qago, RECESSIONAL OUTWASH AQUIFER)
- POORLY GRADED SAND WITH SILT (SP-SM) TO POORLY GRADED SAND (SP) (Qago, RECESSIONAL OUTWASH AQUIFER)
- PROPOSED LANDFILL COVER SYSTEM

NOTE: LOCATION OF CROSS SECTIONS ARE SHOWN ON FIGURE 33.

CROSS SECTIONS
ALTERNATIVE 3
March Point (Whitmarsh) Landfill
Skagit County, Washington

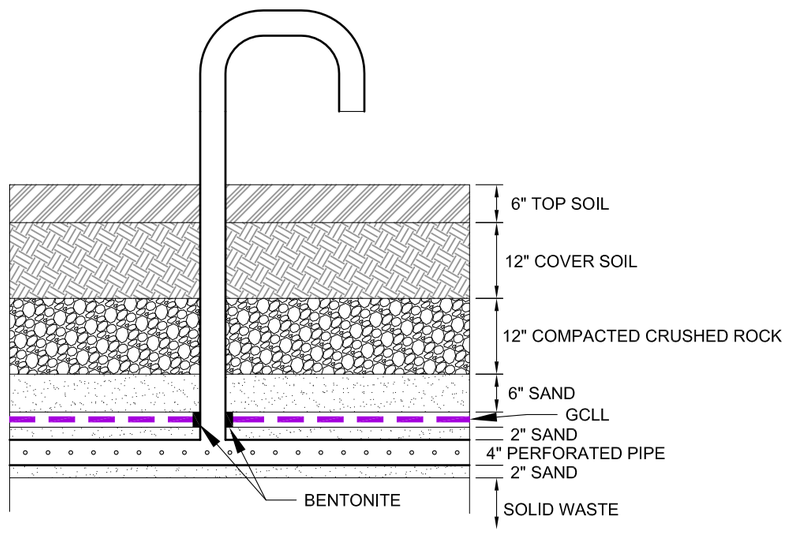
By: APS	Date: 03/04/16	Project No. 14159
amec		Figure **34**

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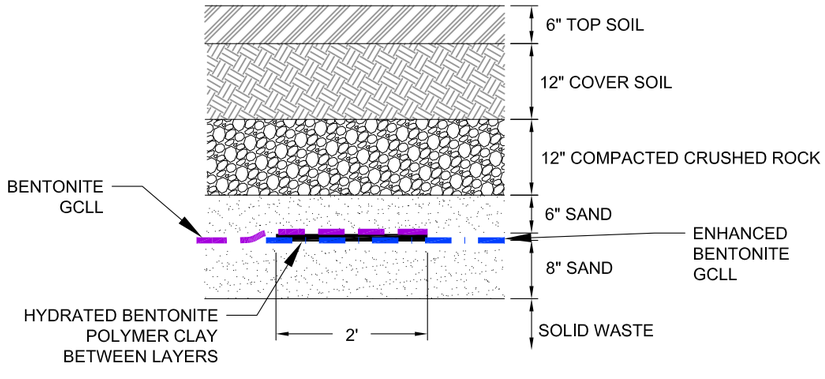
1 DETAIL ALONG INNER LAGOON

0 2.5 5
APPROXIMATE SCALE IN FEET



2 PASSIVE LANDFILL GAS VENT DETAIL

0 1 2
APPROXIMATE SCALE IN FEET



3 GCLL OVERLAP DETAIL

0 1 2
APPROXIMATE SCALE IN FEET

INNER LAGOON DETAILS
ALTERNATIVE 3
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 05/10/16	Project No. 14159
amec		Figure 35

Plot Date: 05/10/16 - 2:43pm, Plotted by: adam.stenberg
Drawing Path: S:\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_Design_041216_recover.dwg

Background (from Wood PLC)

The March Point Landfill (Site) was a public dump in the 1950s and was later operated by Skagit County as a landfill from 1961 until its closure in 1973. As part of closure requirements in 1973, the Site was graded and covered with 2-3 feet of soil. The soil cap was installed in accordance with regulations at the time including minimum functional standards for soil waste handling, enacted by Washington State under Chapter 173-301 WAC (filed in 1972). Due to the Site's proximity and potential impacts to Padilla Bay and the inner lagoon, it was identified by Ecology as a high priority cleanup area under the Puget Sound Initiative. Until approximately 2010, the northern two-thirds of the Site was occupied by a cedar log sawmill, which had operated in this location since the 1980s. The former mill area currently contains building foundation concrete slabs, partially dismantled buildings, and an intact shop building.

In 2014 and 2015, approximately 44,000 cubic yards of wood waste debris from the sawmill was hauled off site and recycled as compost material; an estimated 13,000 cubic yards of wood waste debris mixed with rock remains on site. Most of this material is stockpiled in two piles southeast of the sawmill foundations. The rest of the residual wood waste is located near the former mill building foundation.

The remedial investigation showed the following exceedances of the preliminary cleanup levels:

- Soil: total and dissolved metals, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons in the gasoline range and oil ranges, benzene, semivolatile organic compounds (SVOCs), and pesticides.
- Groundwater: total and dissolved metals, PCBs, benzene, SVOCs, pesticides.
- Seeps: total and dissolved metals, benzene, the SVOC 1-methylnaphthalene, PCBs, the pesticide 4,4'-DDE.
- Surface water: total and dissolved metals, benzene, SVOCs, and the pesticide 4,4' DDD.

A sediment investigation and watershed study was performed at the Site in a series of events from 2008 through 2011. The results of the sediment investigation concluded that discharges from the landfill do not have a negative effect on the sediment biota. Therefore, no impacts on sediments in the inner lagoon or Padilla Bay associated with the landfill were identified.

In addition, landfill gas (LFG) monitoring in 2011 and 2012 revealed elevated methane concentrations within the wood waste which was placed over the original soil cover. The highest concentrations of methane generally coincided with the thickest accumulations of wood waste. Since only a portion of the wood waste remains, the concentrations of LFG should be much lower today.

A conceptual site model was developed that suggests that areas exist along the landfill boundary where groundwater within the solid waste is seeping, or has the potential to seep, into surface water. The conceptual site model showed the exposure pathways and receptors for human health receptors are as follows:

- Direct human exposure to solid waste through construction activities.
- Seasonal infiltration of surface water into the solid waste, causing discharge of groundwater to the inner lagoon through seeps, where it could eventually affect marine biota.
- Migration of shallow groundwater though the Bay Mud into the underlying Lower Aquifer and subsequent discharge to surface waters or marine sediment where it could affect marine biota.
- Potential exposure of solid waste through erosion and direct release to surface waters/marine sediment of the inner lagoon where it could affect marine biota.
- Volatilization, dust emission, and inhalation of chemicals and methane gas generated from solid waste.

Project Description

Several remedial alternatives were developed for this site and were evaluated using seven criteria: protectiveness; permanence; long term effectiveness; short term risk; technical and administrative implementability; public concerns; and cost. In addition, the restoration time frame for each alternative was considered and a disproportionate cost analysis was performed for the alternatives.

Based on this evaluation, the selected alternative was the installation of a Geosynthetic Clay Laminated Liner (GCLL) cap. The alternative includes:

- Demolition of the structures on site;
- Moving solid waste (45,000 cubic yards), including riprap on the shorelines, from the edges of the landfill inward, to allow construction of a permanent cap without expanding the footprint of the landfill.
- Grading the waste to a mound per the Minimum Functional Standards of WAC-173-304 to promote stormwater runoff.
- Installing enhanced GCLL extending to the Bay Mud and constructing a perimeter access road around the landfill. The engineered cap will minimize or eliminate infiltration of groundwater into the landfill and the GCLL would minimize discharge of groundwater from the landfill to surface waters.
- Treating wastewater (1.3 million gallon) generated during the construction work.
- Installing a landfill gas (LFG) collection system, which would vent LFG to the atmosphere, as well as groundwater collection/treatment as needed to prevent off-site migration.
- Installing stormwater control measures and constructing a surface drainage system on and around the landfill.
- Installation of a perimeter road for access to wells and the LFG vent system.
- Installation of stubouts for future use of public water and electricity.
- Providing institutional and engineering controls.
- Performing long-term monitoring of groundwater (quality and levels for hydraulic control purpose), seepage, LFG, and the landfill closure facility.
- Institutional controls will be implemented when the cleanup action is complete including installation of a permanent chain link fence around the perimeter of the landfill to limit site access.

The existing riprap will be removed from the shoreline and the shoreline slope will be flattened to 5H:1V and constructed with a multi-layer cap system, the upper 18 inches of which will be of suitable soil to facilitate development of vegetative communities. The vegetation that will be selected will include a variety of native shrubs; however, trees will not be planted due to their tendency to have root systems that could penetrate the cover soils and possibly damage the GCLL. A temporary watering system will be installed to provide supplemental water for the plantings. Approximately 1.6 acres of habitat will be created upon completion of the project. The cleanup project is expected to significantly reduce leachate seepage to surface water and groundwater, control LFG venting, and limit sedimentation into Padilla Bay due to uncontrolled surface water drainage.

Prior to construction, a Heron Management Plan for the March Point Heronry will be prepared. Work will include conducting noise monitoring during the breeding season (April through July) the year prior to anticipated construction that will establish background noise levels; identifying daily and seasonal noise restrictions; and propose mitigation actions. The established noise levels will be compared against the anticipated construction noise levels and durations. Recommendations will be developed for the construction activities. Finalization of the Heron

Management Plan will likely include coordination with the City of Anacortes, Ecology, and local stakeholders.

Compliance monitoring will include construction performance monitoring to ensure the work is performed in compliance with the project requirements. Post-construction performance monitoring of groundwater, seeps, LFG, and stormwater after will be conducted after construction of the landfill cap is complete to determine (1) whether the cap is performing as expected, (2) whether leachate is continuing to seep from the landfill into Padilla Bay, and (3) whether lateral migration of groundwater into the solid waste or lateral migration of LFG away from the landfill is occurring. Ecology will review the selected cleanup action every five years to ensure protection of human health and the environment.

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Appendix B – Supplementary Figures

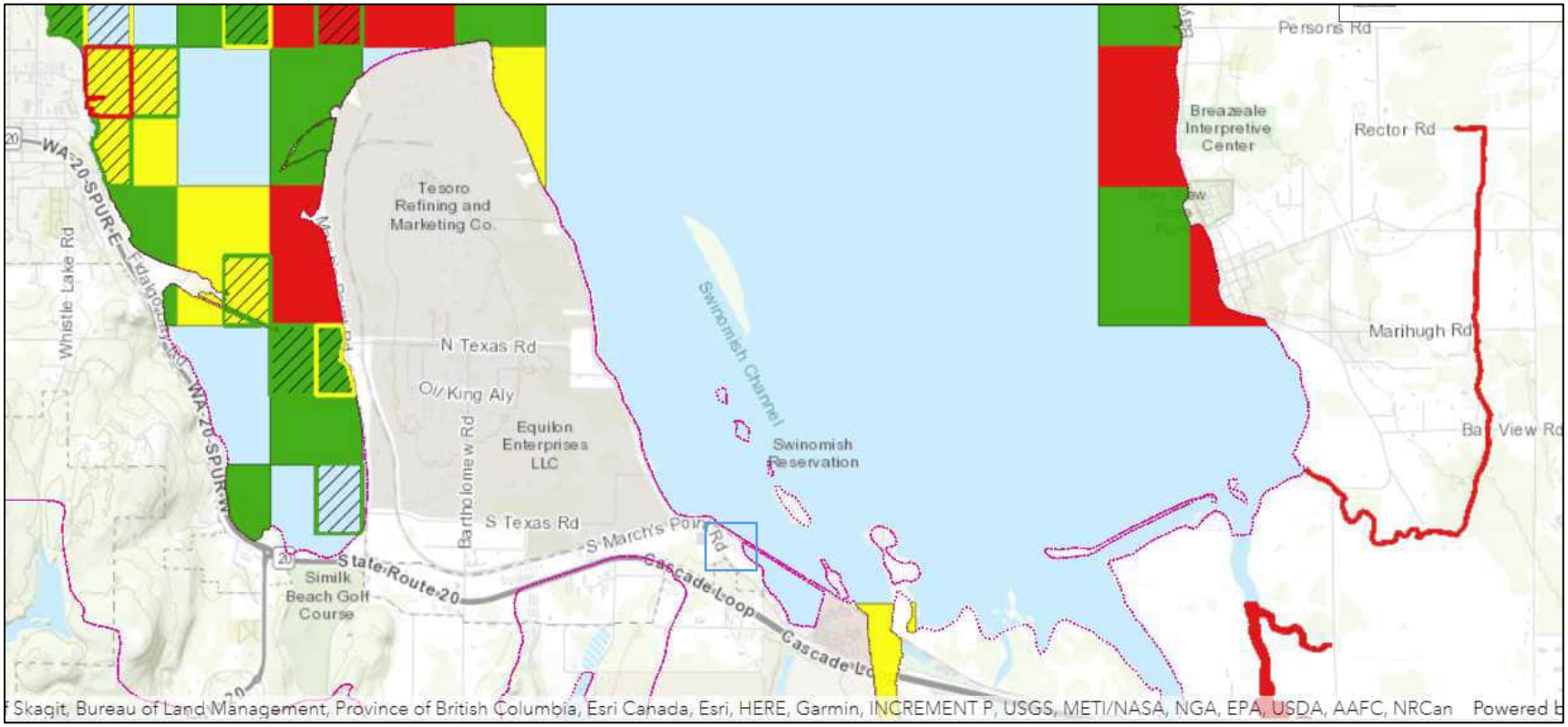


Figure B-1. Assessed waters within Fidalgo Island-Frontal Padilla Bay sub-watershed. Study area in blue (Ecology 2020).

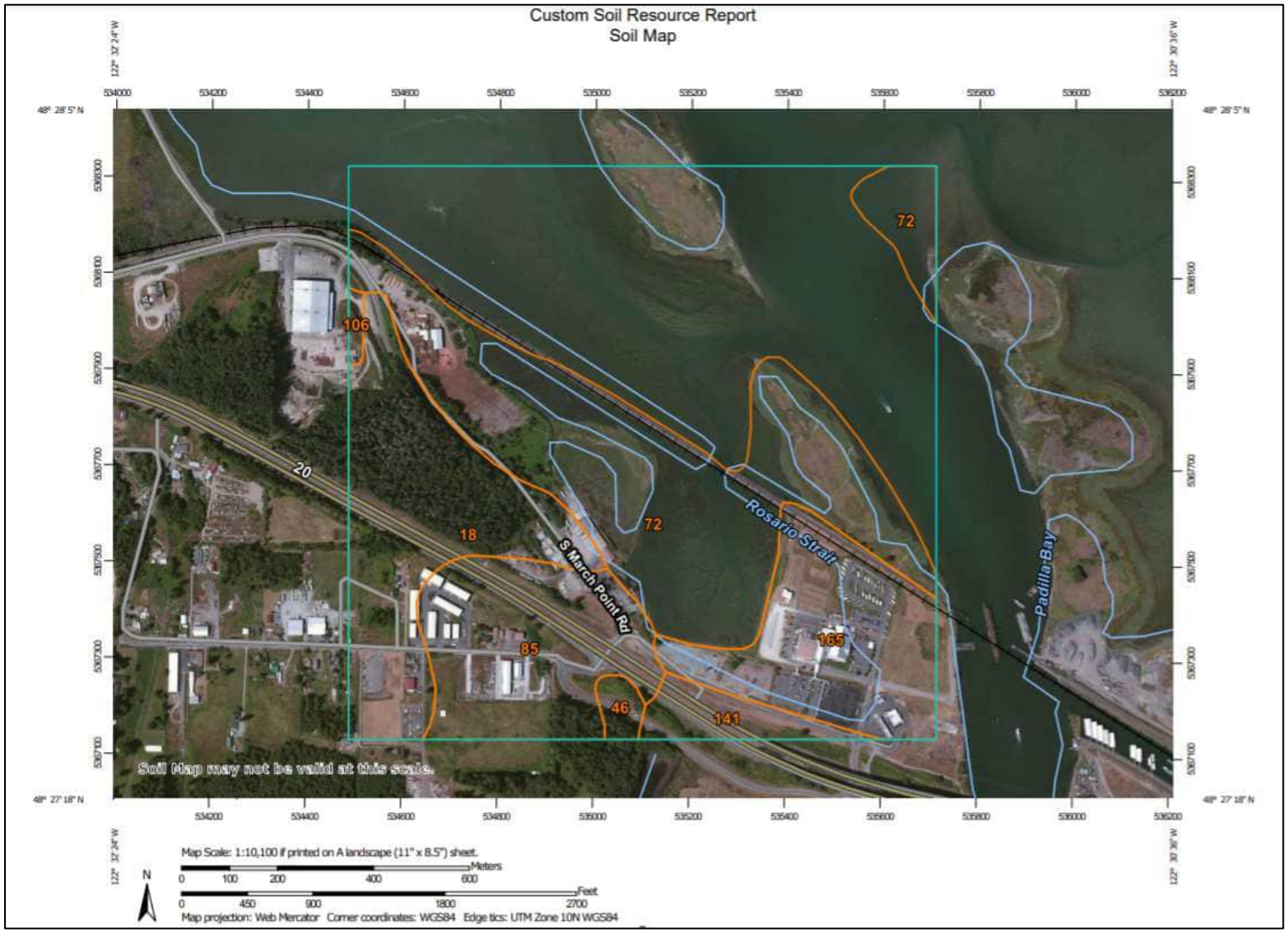
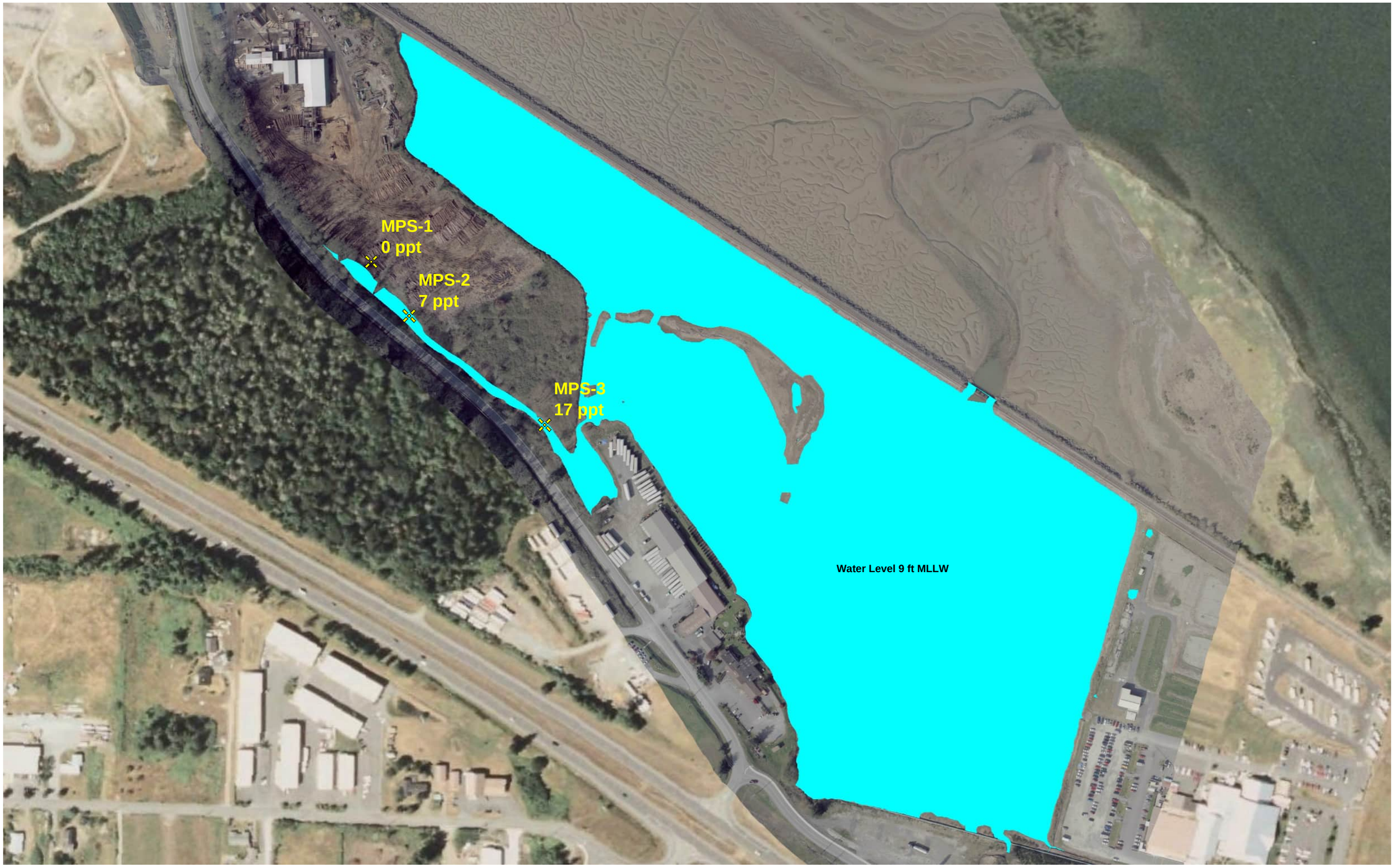


Figure B-2. Custom soil map of study area.


MPS-1
0 ppt
MPS-2
7 ppt
MPS-3
17 ppt
Water Level 9 ft MLLW

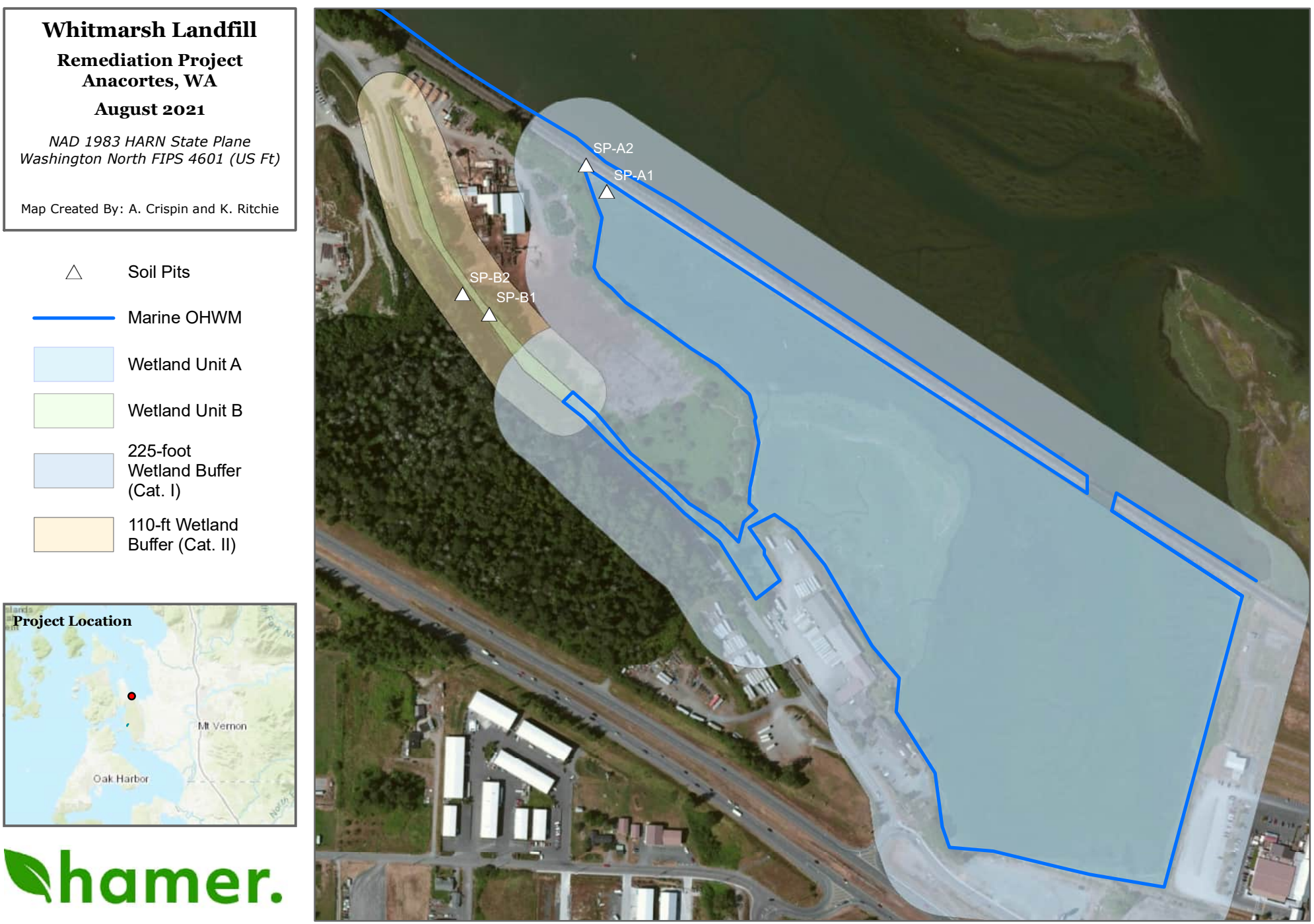
Whitmarsh Landfill

Remediation Project
Anacortes, WA

August 2021

NAD 1983 HARN State Plane
Washington North FIPS 4601 (US Ft)

Map Created By: A. Crispin and K. Ritchie



- Soil Pits
- Marine OHWM
- Wetland Unit A
- Wetland Unit B
- 225-foot Wetland Buffer (Cat. I)
- 110-ft Wetland Buffer (Cat. II)

hamer.

Data Sources: Data.gov, WA State Geospatial Open Data Portal, WSDOT GIS Data Portal, USDA: NRCS Geospatial Data Gateway, Washington State Department of Ecology, USFWS NWI Data Portal, WA DNR GIS Open Data, WA FWS Salmonscape, FEMA. gov NFHL Updated: 2020

Appendix C – Wetland Determination Data Forms

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WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Whitmarsh Landfill Wetland Delineation | City/County: Skagit | Sampling Date: 7/12/2021

Applicant/Owner: WSDOT | State: WA | Sampling Point: SP-A1

Investigator(s): Adam Crispin | Section, Township, Range: S6, T34N, R02E

Landform (hillslope, terrace, etc.): floodplain | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): A | Lat: 48.463758° | Long: -122.530635° | Datum: NAD83HARN

Soil Map Unit Name: Hydraquents, tidal | NWI Classification: E2EM1/USN

Are climatic / hydrologic conditions on the site typical for this time of year? ◉ Yes ○ No (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? ◉ Yes ○ No

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	◉ Yes	○ No	**Is the Sampled Area within a Wetland?**	◉ Yes ○ No
Hydric Soil Present?	◉ Yes	○ No		
Wetland Hydrology Present?	◉ Yes	○ No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 15ft x 15ft)				
1. *Schoenoplectus maritimus*	30	Y	75.0	OBL
2. *Triglochin maritima*	10	Y	25.0	OBL
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	40 = Total Cover			
Woody Vine Stratum (Plot size:)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		40 (B)

Prevalence Index = B/A = 1.000

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ◉ Yes ○ No

Remarks:

SOIL

Sampling Point: SP-A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/1	60	5YR	5/8	40	C	M	Silt Loam	High organic content
4-16	10YR	2/1	70	10YR	5/1		D	M	Silt Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☑ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ◉ Yes ○ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☑ Algal Mat or Crust (B4)
- ☑ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☑ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ◉ Yes ○ No Depth (inches): 1

Water Table Present? ◉ Yes ○ No Depth (inches): 4

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Whitmarsh Landfill Wetland Delineation | City/County: Skagit | Sampling Date: 7/12/2021

Applicant/Owner: Wood PLC | State: WA | Sampling Point: SP-A2

Investigator(s): Adam Crispin | Section, Township, Range: S6, T34N, R02E

Landform (hillslope, terrace, etc.): floodplain | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): A | Lat: 48.463758° | Long: -122.530635° | Datum: NAD83HARN

Soil Map Unit Name: Hydraquents, tidal | NWI Classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? ◉ Yes ○ No (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? ◉ Yes ○ No

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	◉ Yes	○ No	**Is the Sampled Area within a Wetland?**	○ Yes ◉ No
Hydric Soil Present?	○ Yes	◉ No		
Wetland Hydrology Present?	○ Yes	◉ No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20 ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft)				
1. *Rubus armeniacus*	15	Y	100.0	FAC
2.				
3.				
4.				
5.				
	15 = Total Cover			
Herb Stratum (Plot size: 15ft)				
1. *Conium maculatum*	20	Y	33.3	FAC
2. *Agrostis gigantea*	20	Y	33.3	FAC
3. *Chamaenerion angustifolium*	20	Y	33.3	FACU
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	60 = Total Cover			
Woody Vine Stratum (Plot size: 15ft)				
1. *Rubus armeniacus*	5	Y	100.0	FAC
2.				
	5 = Total Cover			

% Bare Ground in Herb Stratum

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	80 (A)		260 (B)

Prevalence Index = B/A = 3.250

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 5 - Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? ◉ Yes ○ No

Remarks:

SOIL

Sampling Point: SP-A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/2	100					Sand	Fill near railroad, with gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicble to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ◉ Yes ○ No Depth (inches): 17

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ○ Yes ◉ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D – Wetland Rating Forms

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Wetland name or number _____

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 7/12/21

Rated by Adam Crispin Trained by Ecology? __ Yes ___No Date of training_____

HGM Class used for rating Estuarine Wetland has multiple HGM classes? __X_Y __N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map ArcGIS Online

OVERALL WETLAND CATEGORY I (based on functions ___ or special characteristics X)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

_____**Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
	Circle the appropriate ratings									
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	**TOTAL**
Score Based on Ratings										

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	

Wetland name or number _____

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number _____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ___The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number _____

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes **– Go to SC 2.2** No **– Go to SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No = **Is not a bog**	**Cat. I**

Wetland name or number _____

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon**	**Cat. I**
SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating**	**Cat I**
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2**	**Cat. II**
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3**	**Cat. III**
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland Unit B Date of site visit: 7/12/2021

Rated by Adam Crispin Trained by Ecology? ☑ Yes ☐ No Date of training 9/13/2017

HGM Class used for rating Depressional & Flats Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map ArcGIS

OVERALL WETLAND CATEGORY II (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

_____ **Category I** - Total score = 23 - 27
X **Category II** - Total score = 20 - 22
_____ **Category III** - Total score = 16 - 19
_____ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	M	M	M	
Landscape Potential	H	H	M	
Value	M	L	H	**Total**
Score Based on Ratings	7	6	7	**20**

Score for each function based on three ratings (*order of ratings is not important*)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	Category
Estuarine	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	

None of the above	**X**

Wetland name or number B

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	2
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	3
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	2
Map of the contributing basin	D 4.3, D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	6

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including	H 2.1, H 2.2, H 2.3	

polygons for accessible habitat and undisturbed habitat		
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.
If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☑ NO - go to 2 ☐ **YES** - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ **NO - Saltwater Tidal Fringe (Estuarine)** ☐ **YES - Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

☑ NO - go to 3 ☐ **YES** - The wetland class is **Flats**
*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
- ☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☑ NO - go to 4 ☐ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The wetland is on a slope (*slope can be very gradual*),
- ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- ☐ The water leaves the wetland **without being impounded.**

☑ NO - go to 5 ☐ **YES** - The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
- ☐ The overbank flooding occurs at least once every 2 years.

☑ NO - go to 6 ☐ **YES** - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO - go to 7 ☑ **YES** - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO - go to 8 ☐ **YES** - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

NOTES and FIELD OBSERVATIONS:
The open water of Ruggs Lake is less than 20 ac and was therefore rated as one Depressional wetland unit.

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☑ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1		1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*).	Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0		3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0		4
Total for D 1	Add the points in the boxes above	**8**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source Contaminated soils	Yes = 1 No = 0	1
Total for D 2	Add the points in the boxes above	**3**

Rating of Landscape Potential If score is: ☑ **3 or 4 = H** ☐ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = 2 No = 0	0
Total for D 3	Add the points in the boxes above	**1**

Rating of Value If score is: ☐ **2 - 4 = H** ☑ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?		
D 4.1. Characteristics of surface water outflows from the wetland:		2
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*		3
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
☐ The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*		3
☐ The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
☐ Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	**8**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic function of the site?		
D 5.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	**3**

Rating of Landscape Potential If score is: ☑ **3 = H** ☐ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*		0
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
☑ • Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
☐ Flooding from groundwater is an issue in the sub-basin.	points = 1	
☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why	points = 0	
☐ There are no problems with flooding downstream of the wetland.	points = 0	

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 Add the points in the boxes above	**0**

Rating of Value If score is: ☐ **2 - 4 = H** ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ☑ Aquatic bed
- ☑ Emergent
- ☑ Scrub-shrub (areas where shrubs have > 30% cover)
- ☑ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

If the unit has a Forested class, check if:

- ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

2

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

- ☑ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☐ Occasionally flooded or inundated
- ☑ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

- ☐ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ **Lake Fringe wetland** **2 points**
- ☑ **Freshwater tidal wetland** **2 points**

3

H 1.3. Richness of plant species

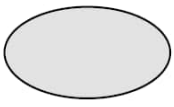
Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted:
- > 19 species — points = 2
- 5 - 19 species — points = 1
- < 5 species — points = 0

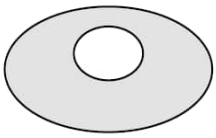
1

H 1.4. Interspersion of habitats

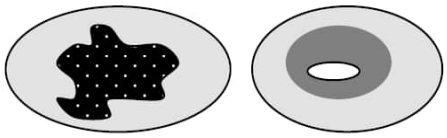
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points



Low = 1 point

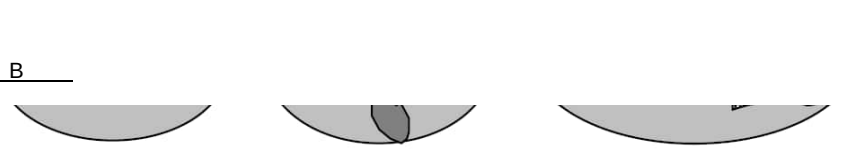


Moderate = 2 points

2

All three diagrams in this row are **HIGH** = 3 points





H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☐ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☑ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☑ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	3
Total for H 1 Add the points in the boxes above	**11**

Rating of Site Potential If Score is: ☐ **15 - 18 = H** ☑ **7 - 14 = M** ☐ **0 - 6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 4.8 % undisturbed habitat + (1.5 % moderate & low intensity land uses / 2) = 5.55% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 10.4 % undisturbed habitat + (44.9 % moderate & low intensity land uses / 2) = 32.85% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	2
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	**2**

Rating of Landscape Potential If Score is: ☐ **4 - 6 = H** ☑ **1 - 3 = M** ☐ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated*. Site meets ANY of the following criteria: points = 2 ☑ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a	2

watershed plan		
Site has 1 or 2 priority habitats (listed on next page) with in 100m	points = 1	
Site does not meet any of the criteria above	points = 0	

Rating of Value If Score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE**: This question is independent of the land use between the wetland unit and the priority habitat.*

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☐ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☑ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are >

12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☑ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☑ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☑ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☑ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☑ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir,	

western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?

☐ Yes = **Is a Category I bog** ☑ No = **Is not a bog**

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

☐ Yes - Go to **SC 5.1** ☑ No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes - Go to **SC 6.1** ☑ No = **Not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

☐ Yes = **Category I** ☐ No - Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ Yes = **Category III** ☐ No = **Category IV**

Category of wetland based on Special Characteristics

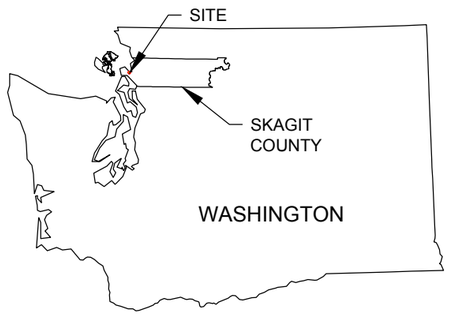
If you answered No for all types, enter "Not Applicable" on Summary Form

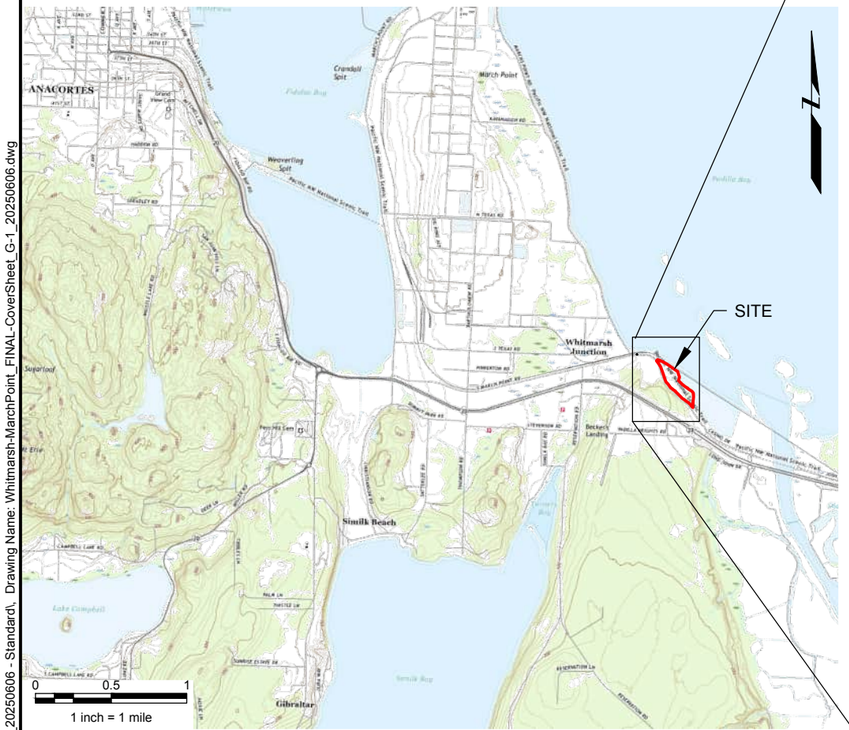
APPENDIX D

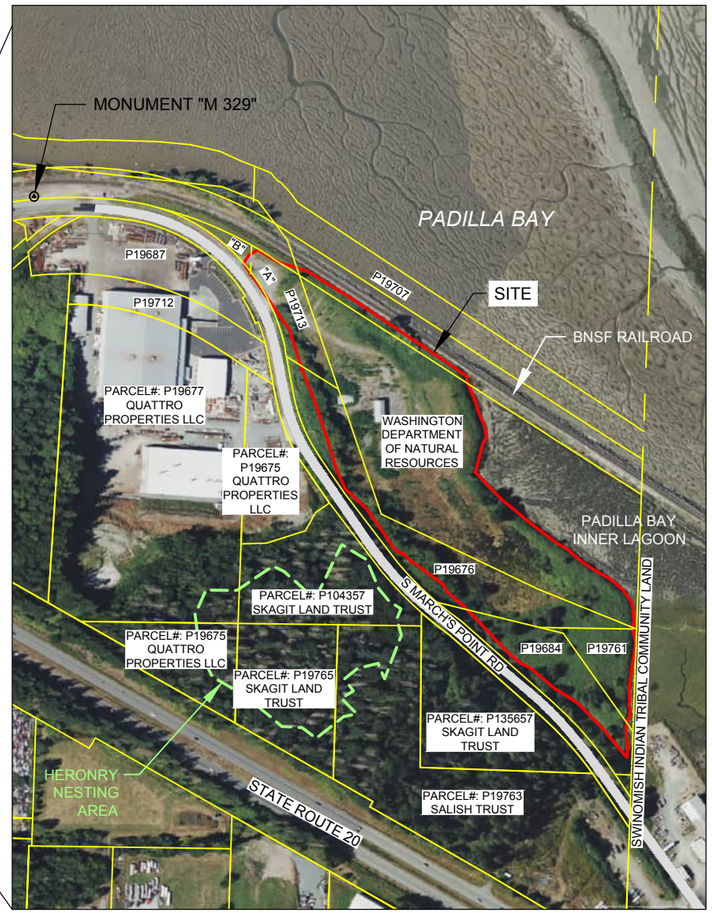
DESIGN DRAWINGS AND SPECIFICATIONS

REMEDIAL ACTION

MARCH POINT (WHITMARSH) LANDFILL
ANACORTES, SKAGIT COUNTY, WASHINGTON







HORIZONTAL DATUM

REFERENCE FRAME: NORTH AMERICAN DATUM (NAD)83
COORDINATE SYSTEM: US STATE PLANE COORDINATE SYSTEM WASHINGTON NORTH ZONE
FOOT DEFINITION: US SURVEY FOOT

VERTICAL DATUM

ELEVATION DATUM: MEAN LOWER LOW WATER (MLLW) IN FEET
BENCHMARK: NGS MONUMENT "M 329"
CONVERSIONS:NAVD88 = 16.02'
NGVD29 = 12.24'
MLLW = 16.55'

APPROVED FOR CONSTRUCTION

GRACE K. KANE, P.E., PUBLIC WORKS DIRECTOR/COUNTY ENGINEER DATE

PROPERTY DESCRIPTION:

PARCEL #19676
That Portion of the following described property lying Easterly of the Old Anacortes-Mount Vernon Highway, The land in the County of Skagit, State of Washington, described as follows: That portion of Government Lot 1 of Section 3, Township 34 North, Range 2 East, W.M., lying Southerly of a line which is equidistant 300 feet Southerly of and parallel to or concentric with the centerline of the right of way of the Great Northern Railway Company (formerly Seattle & Northern Railway Co.), as said centerline of said railroad existed on June 4, 1902, EXCEPT roads, EXCEPT that portion of said property conveyed to Skagit County by Deed dated August 21, 1922 and recorded October 5, 1923, under Auditor's File No. 168344 and recorded in Volume 126 of Deeds, page 633, EXCEPT that portion of said premises conveyed to the State of Washington by Deed dated August 8, 1939 and recorded in Volume 175 of Deeds, page 301, EXCEPT that portion condemned by the State of Washington by Decree entered on May 22, 1961 in the Superior Court for Skagit County under Cause No. 26054, AND EXCEPT that portion lying within the following described premises: Beginning at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the E. Kasch Road; thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the point of beginning.

Records of Skagit County. Washington;
Parcel #19684
The land in the County of Skagit, State of Washington, described as follows: That portion of Government Lot 1 and of the Northeast 1/4 of the Southeast 1/4 of Section 3, Township 34 North, Range 2 East, W.M., described as follows: BEGINNING at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the East Kasch Road: thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the Point Of Beginning: EXCEPT that portion thereof lying Southwesterly of the Southeasterly right-of-way margin of South March Point Read as the same is shown on that certain Deed of Trust recorded under Skagit County Auditor's File No. 9204090078, AND EXCEPT that portion conveyed to Skagit County for road purposes by deed recorded October 5, 1923, under Auditor's File No. 168350 and recorded in Volume 126 of Deeds, page 639, records of Skagit County, Washington, ALSO EXCEPT that portion, if any, conveyed to Skagit County for road purposes by deed recorded October 5. 1923 under Auditor's File No. 168344, in Volume 126 of Deeds, page 633. Records of Skagit County. Washington; ALSO EXCEPT that portion thereof, if any, lying with the right-of-way of the existing as-built County road known as the Anacortes-Mt. Vernon Highway. Situate in the City of Anacortes, County of Skagit, State of Washington.

Parcel #19713
The land in the County of Skagit, State of Washington, described as follows:
PARCEL "A":
That portion of the following described property lying Easterly of the old Anacortes-Mount Vernon Highway;
That portion of Government Lot 1 in Section 3, Township 34 North, Range 2 East, W.M., lying Southerly of a line which is equidistant 300 feet Southerly of and parallel to or concentric with the centerline of the right of way of the Great Northern Railway Company (formerly Seattle & Northern Railway Co.), as said centerline of said railroad existed on June 4, 1902,
EXCEPT roads, EXCEPT that portion of said property conveyed to Skagit County by Deed dated August 21, 1922 and recorded October 5, 1923, under Auditor's File No. 168344 and recorded in Volume 126 of Deeds, page 633, EXCEPT that portion of said premises conveyed to the State of Washington by Deed dated August 8, 1939 and recorded in Volume 175 of Deeds, page 301, EXCEPT that portion condemned by the State of Washington by Decree entered on May 22,1961 in the Superior Court for Skagit County under Cause No. 26054, AND EXCEPT that portion lying within the following described premises: Beginning at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the E. Kasch Road; thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the point of beginning. Situate in the County of Skagit, State of Washington.
PARCEL "B":
That portion of the following described tract of land lying and being Northerly of the State Highway, as conveyed by Deeds recorded in Volume 38 of Deeds, page 54, Volume 133 of Deeds, page 386, and in Volume 175 of Deeds, page 302, records of Skagit County, Washington: A strip or piece of land 250 feet wide in Government Lots 1 and 2 of Section 3, Township 34 North, Range 2 East, W.M., being all that part of said Lots 1 and 2, lying between 2 lines parallel to and distant, respectively, 50 feet and 300 feet Southerly, measured at right angles from the centerline of the main track of the former Seattle and Northern Railway Company as conveyed by Deed recorded January 10, 1890, in Volume 9 of Deeds, page 307, records of Skagit County, Washington, as said tract was located and constructed on June 4, 1902, EXCEPTING THEREFROM all that part thereof lying Southwest of the following described line: Beginning at a point in said Lot 2, 300 feet distant Southeasterly from the said centerline of main tract, as measured at right angles to said centerline from a point therein, 555.4 feet distant Northeasterly, measured along said centerline, from the West line of said Lot 2; thence Northwesterly at right angles to said centerline, 165 feet to a point 135 feet distant Southeasterly from said centerline; thence Northwesterly in a straight line to a point 50 feet distant Southeasterly from said centerline, as measured at right angles thereto, from a point therein, 430.4 feet distant Northeasterly measured along said centerline form the West line of said Lot 2. EXCEPT from said strip of land the 30 foot wide right of way of the Puget Sound and Baker River Railway Company right of way, as disclosed by Deed recorded December 18, 1933, under Auditor's File No. 259220, in Volume 163 of Deeds, page 441, records of Skagit County, Washington. Situate in the County of Skagit, State of Washington.

Parcel #19761
The land in the County of Skagit, State of Washington, described as follows:
The Northeast ¼ of the Southeast ¼, lying North and East of 'Kasch Road', Section 3, Township 34 North,Range 2 East, W.M.; EXCEPT that portion, if any, lying within said Northeast ¼ of the Southeast ¼, Section 3, Township 34 North, Range 2 East, W.M., as conveyed to M. Ellen Moon, as Trustee of 'The Charles E. Moon Credit Trust', by Deed recorded February 26, 2003 under Skagit County Auditor's File No. 200302260113; AND EXCEPT Roads. Situate within the City of Anacortes, County of Skagit, State of Washington.

811 Know what's below. Call before you dig.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON — Serving With Pride

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

KOORUS TAHCHEE — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

COVER SHEET

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING
G-1

Plot Date: 11/06/25 - 8:54am, Plotted by: USAS719374
Drawing Path: G:\Whitmarsh\Whitmarsh-MarchPoint_FINAL-CoverSheet_G-1_20250606 - Standard\, Drawing Name: Whitmarsh-MarchPoint_FINAL-CoverSheet_G-1_20250606.dwg

DRAWINGS LIST:

G-1	COVER SHEET
G-2	GENERAL NOTES
G-3	EXISTING SITE PLAN
G-4	EXISTING UTILITIES
C-1	SITE SETUP
C-2	TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN
C-3	TEMPORARY EROSION AND SEDIMENTATION CONTROL DETAILS
C-4	WATER TREATMENT SYSTEM
C-5	TOP OF WASTE GRADES
C-6	GATE ENTRANCE EXCAVATION
C-7	FINAL GRADING PLAN
C-8	FINAL SITE PLAN
C-9	CROSS SECTION A
C-10	CROSS SECTION B and X
C-11	CROSS SECTIONS C and D
C-12	CROSS SECTIONS E and F
C-13	DETAILS
C-14	DETAILS
C-15	TEMPORARY OUTFALL DETAILS
R-1	SITE PLANTING PLAN
R-2	PLANTING PLAN ALONG PADILLA BAY INNER LAGOON
R-3	PLANTING PLAN ALONG SOUTHERN DITCH
R-4	SAMPLE PLANTING PLAN
R-5	PLANTING DETAILS AND NATIVE PLANT SCHEDULE
R-6	TEMPORARY IRRIGATION CONCEPT PLAN
R-7	TEMPORARY IRRIGATION CONCEPT AREAS

ABBREVIATIONS:

MLLW	MEAN LOWER LOW WATER
HTL	HIGH TIDE LINE
EL	ELEVATION
GCLL	GEOSYNTHETIC CLAY LINER WITH LAMINATION
MW	MONITORING WELL
MWD	DEEP MONITORING WELL
PZ	PIEZOMETER
LFGP	LANDFILL GAS PROBE
SSMH	STORM SEWER MANHOLE
SSCO	STORM SEWER CLEAN OUT
IE	INVERT ELEVATION
DIA	DIAMETER
OC	ON CENTER
LF	LINEAR FEET
SF	SQUARE FEET
GPM	GALLONS PER MINUTE
PSI	POUNDS PER SQUARE INCH

GENERAL NOTES:

1. ON THIS PROJECT, CONTRACTING AGENCY REFERS TO SKAGIT COUNTY, ENGINEER REFERS TO WSP, AND CONTRACTOR REFERS TO THE REMEDIATION CONTRACTOR.
2. SITE SURVEY CONDUCTED BY NORTHWEST DATUM & DESIGN, INC. AUGUST 31, 2015, AMENDED NOVEMBER 18, 2021.
3. CONTRACTOR IS RESPONSIBLE FOR ALL SURVEYS AND FINAL RECORD SURVEY. CONTRACTING AGENCY MAY ELECT TO CONDUCT CERTAIN IN-PROGRESS SURVEYS TO CALCULATE PAYMENT VOLUMES.
4. CONTRACTING AGENCY HAS OBTAINED ACCESS AGREEMENTS OR WILL OBTAIN USACE PERMIT UNDER NATIONWIDE PERMIT 38, CONSTRUCTION STORMWATER DISCHARGE PERMITS. PRIMARY DISCHARGE SHALL BE TO SURFACE WATER AND CONTINGENCY DISCHARGE SHALL BE TO SANITARY SEWER.
5. CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY FACILITIES AND UTILITIES FOR THEMSELVES AND THE ENGINEER THROUGHOUT THE PROJECT.
6. ALL WELL AND LANDFILL GAS PROBES ABANDONMENT AND INSTALLATIONS WILL BE BY THE ENGINEER.
7. SUBSURFACE SOIL AND GROUNDWATER IS CONTAMINATED. SEE THE PROJECT HEALTH AND SAFETY PLAN FOR THE KNOWN CONTAMINANTS AND CONCENTRATIONS. WORKERS MUST HAVE CURRENT HAZWOPER TRAINING AND MEDICAL MONITORING THROUGHOUT THE PROJECT.
8. CONTRACTOR CONDUCTING WORK WITHIN THE BNSF RIGHT-OF-WAY MUST HAVE RAILROAD SAFETY TRAINING.
9. PROJECT IS REGRADING THE LANDFILL TO FLATTEN THE PERIMETER SLOPES AND CREATE A MOUND ALONG THE CENTER OF THE LANDFILL AND CONSTRUCTING AN ENGINEERED LOW-PERMEABILITY CAP.
10. IT HAS BEEN ESTIMATED THE WORK WILL BEGIN WITH MOBILIZATION IN APRIL AND END WITH FINAL HYDROSEED APPLICATION IN OCTOBER. WORK ALONG THE SHORELINE IS REQUIRED TO BE TIMED WITH THE TIDE CYCLES. NO WORK MAY OCCUR ALONG THE SHORELINE WHEN THE TIDE REACHES ELEVATION 8.0' MLLW.
11. GROUNDWATER EXTRACTION AND TREATMENT WILL BE REQUIRED TO ALLOW THE EXCAVATION TO PROCEED AND TO PREVENT RELEASE OF THE POLLUTED GROUNDWATER TO THE BAY. TREATED WATER SHALL BE DISCHARGED TO THE SOUTH SWALE. ENGINEER WILL COLLECT AND ANALYZE CONFIRMATION SAMPLES.
12. ABOVEGROUND BERMS OUTSIDE THE FENCE MAY BE USED TO BACKFILL THE EXCAVATION OUTSIDE THE FENCE. EXISTING SANDY SOIL OVER THE LANDFILL SHALL BE SALVAGED AND USED TO BUILD THE LANDFILL GAS COLLECTION LAYER.
13. ALL SOLID WASTE IS TO BE INCORPORATED INTO THE LANDFILL. NO EXPORT OF WASTE IS PLANNED. EXCEPTIONS ARE ANY WASTE THAT DOES NOT CLASSIFY AS SOLID WASTE, E.G. BATTERIES AND WASTE GENERATED DURING THE PROJECT.
14. ALL EARTHEN MATERIAL ABOVE THE GEOSYNTHETIC CLAY LINER WITH LAMINATION (GCLL) MUST BE APPROVED CLEAN MATERIAL IMPORTED FROM APPROVED COMMERCIAL SOURCES. TOPSOIL AND COMPOST AS WELL AS BACKFILL FOR SAND DRAINS WILL BE SELECTED AND APPROVED BY THE ENGINEER.
15. A HERONRY IS PRESENT ON THE SOUTH SIDE OF S. MARCH POINT ROAD. THERE ARE STRICT NOISE RESTRICTIONS ON THE FIELD ACTIVITIES INCLUDING EQUIPMENT OPERATIONS AND MAINTENANCE. THE GOAL IS TO KEEP NOISE LEVELS BELOW ESTABLISHED THRESHOLDS AS DESCRIBED IN THE HERON MANAGEMENT PLAN. ENGINEER WILL CONDUCT NOISE MONITORING AND WILL STOP THE OPERATIONS IF NOISE EXCEEDANCE IS NOTED.
16. THE PROJECT SEQUENCING HAS BEEN ESTABLISHED TO PROCEED FROM NORTHWEST IN THE CLOCKWISE DIRECTION SUCH THAT WHEN THE WORK REACHES THE CLOSEST POINT TO THE HERONRY WOULD BE AT THE END OF THE BREEDING SEASON. CHANGES MAY OCCUR, AS APPROVED BY THE ENGINEER.
17. THE LANDFILL HAS BEEN CONSTRUCTED OVER THE HISTORIC SHORELINE. THE ENGINEER'S ARCHEOLOGIST WILL BE ON SITE DURING EXCAVATION ON THE SOUTHEAST, SOUTH, SOUTHWEST AND WEST AREA WHERE THE ORIGINAL GRADES MAY BE REACHED. IF ARCHEOLOGICAL ARTIFACTS ARE FOUND, THE WORK IN THAT LOCATION WILL HALT UNTIL THE AREA HAS BEEN CLEARED. WORK MAY CONTINUE ELSEWHERE.
18. CONTRACTOR SHALL CONFIRM ALL UTILITIES ARE DISCONNECTED AS SHOWN INCLUDING CONFIRMING WATER (FIRELINE) IS DISCONNECTED. REPORT ANY LIVE UTILITIES TO THE CONTRACTING AGENCY. ABANDON EXISTING UTILITY PIPING IN PLACE.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1	NEW DRAWING	05/19/25	KT

DRAWN AS | DESIGNED KT | CHECKED KT | REVIEWED KT

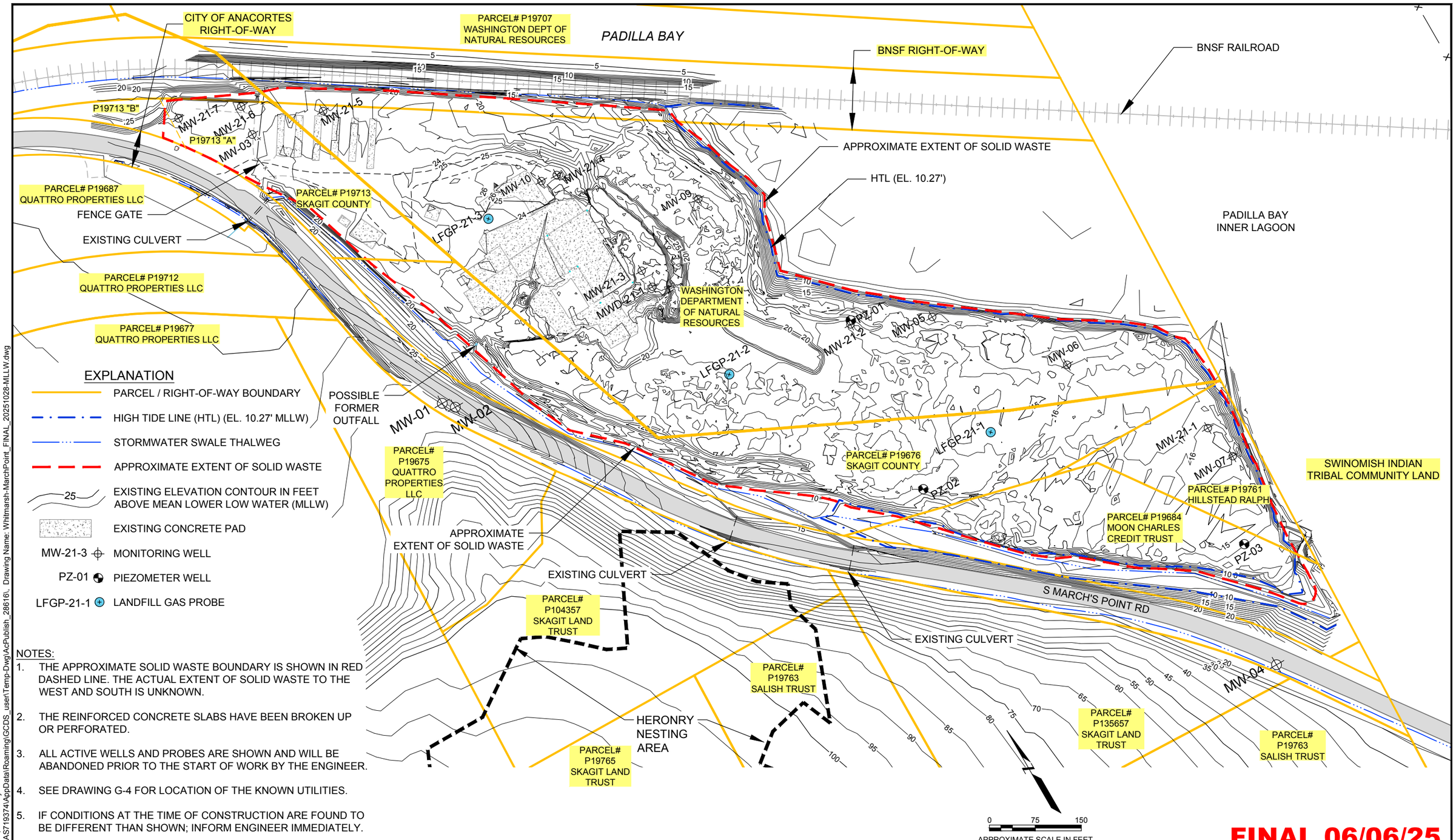
WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

GENERAL NOTES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING G-2

Plot Date: 11/06/25 - 8:37am Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-DwgAcPublish_28616\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



EXPLANATION

- PARCEL / RIGHT-OF-WAY BOUNDARY
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING CONCRETE PAD
- MW-21-3 — MONITORING WELL
- PZ-01 — PIEZOMETER WELL
- LFGP-21-1 — LANDFILL GAS PROBE

NOTES:

1. THE APPROXIMATE SOLID WASTE BOUNDARY IS SHOWN IN RED DASHED LINE. THE ACTUAL EXTENT OF SOLID WASTE TO THE WEST AND SOUTH IS UNKNOWN.
2. THE REINFORCED CONCRETE SLABS HAVE BEEN BROKEN UP OR PERFORATED.
3. ALL ACTIVE WELLS AND PROBES ARE SHOWN AND WILL BE ABANDONED PRIOR TO THE START OF WORK BY THE ENGINEER.
4. SEE DRAWING G-4 FOR LOCATION OF THE KNOWN UTILITIES.
5. IF CONDITIONS AT THE TIME OF CONSTRUCTION ARE FOUND TO BE DIFFERENT THAN SHOWN; INFORM ENGINEER IMMEDIATELY.

0 75 150
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

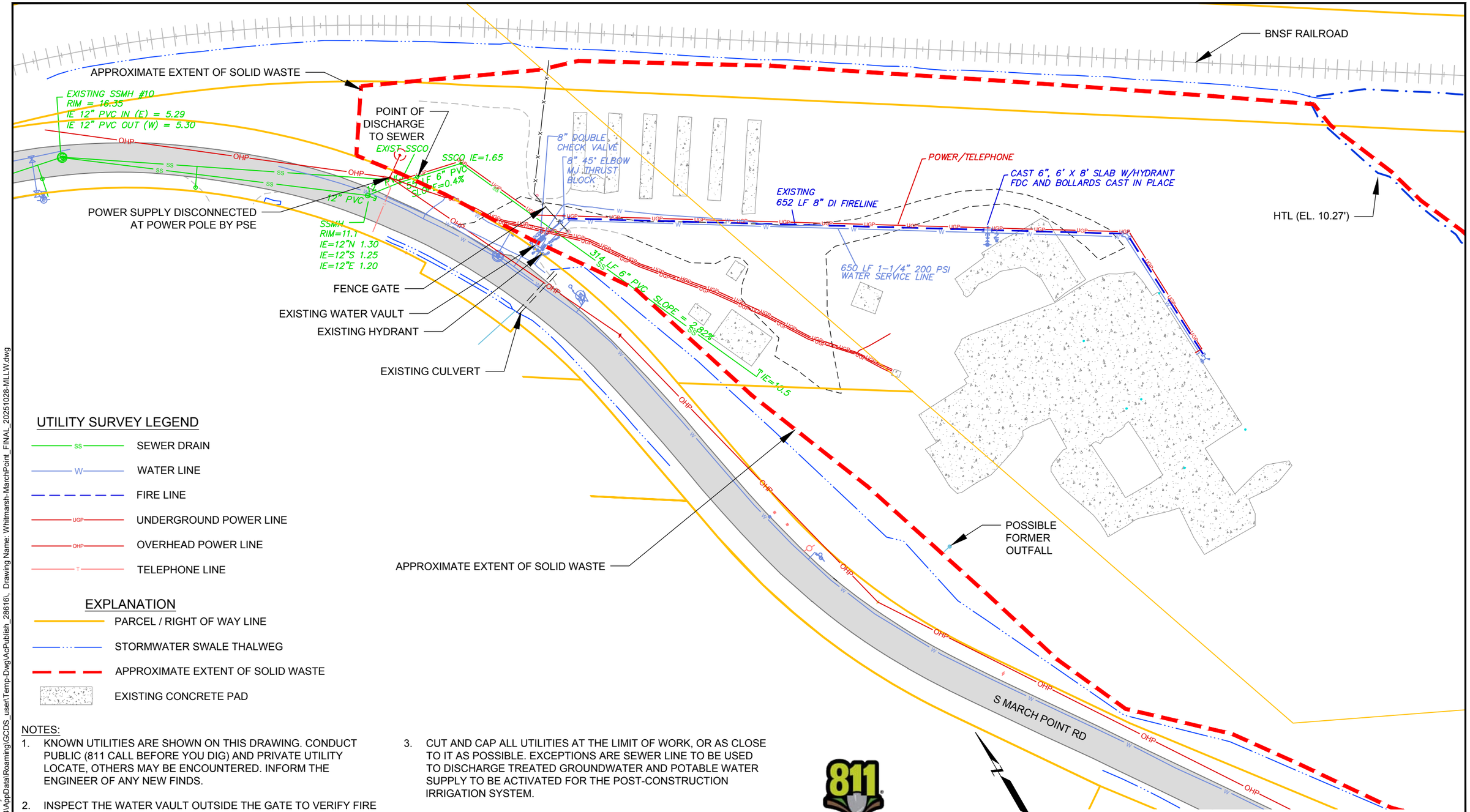
WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

EXISTING SITE PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING G-3

Plot Date: 11/06/25 - 8:37am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



UTILITY SURVEY LEGEND

- SS — SEWER DRAIN
- W — WATER LINE
- FIRE LINE
- UGP — UNDERGROUND POWER LINE
- OHP — OVERHEAD POWER LINE
- T — TELEPHONE LINE

EXPLANATION

- PARCEL / RIGHT OF WAY LINE
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE
- EXISTING CONCRETE PAD

NOTES:

1. KNOWN UTILITIES ARE SHOWN ON THIS DRAWING. CONDUCT PUBLIC (811 CALL BEFORE YOU DIG) AND PRIVATE UTILITY LOCATE, OTHERS MAY BE ENCOUNTERED. INFORM THE ENGINEER OF ANY NEW FINDS.
2. INSPECT THE WATER VAULT OUTSIDE THE GATE TO VERIFY FIRE LINE HAS BEEN DISCONNECTED.
3. CUT AND CAP ALL UTILITIES AT THE LIMIT OF WORK, OR AS CLOSE TO IT AS POSSIBLE. EXCEPTIONS ARE SEWER LINE TO BE USED TO DISCHARGE TREATED GROUNDWATER AND POTABLE WATER SUPPLY TO BE ACTIVATED FOR THE POST-CONSTRUCTION IRRIGATION SYSTEM.
4. AN ACTIVE HYDRANT IS PRESENT NEAR THE LANDFILL ENTRANCE. CONTRACTOR IS RESPONSIBLE AND PAY FOR WATER SUPPLY NEEDED FOR THE PROJECT.

811 Know what's below. Call before you dig.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

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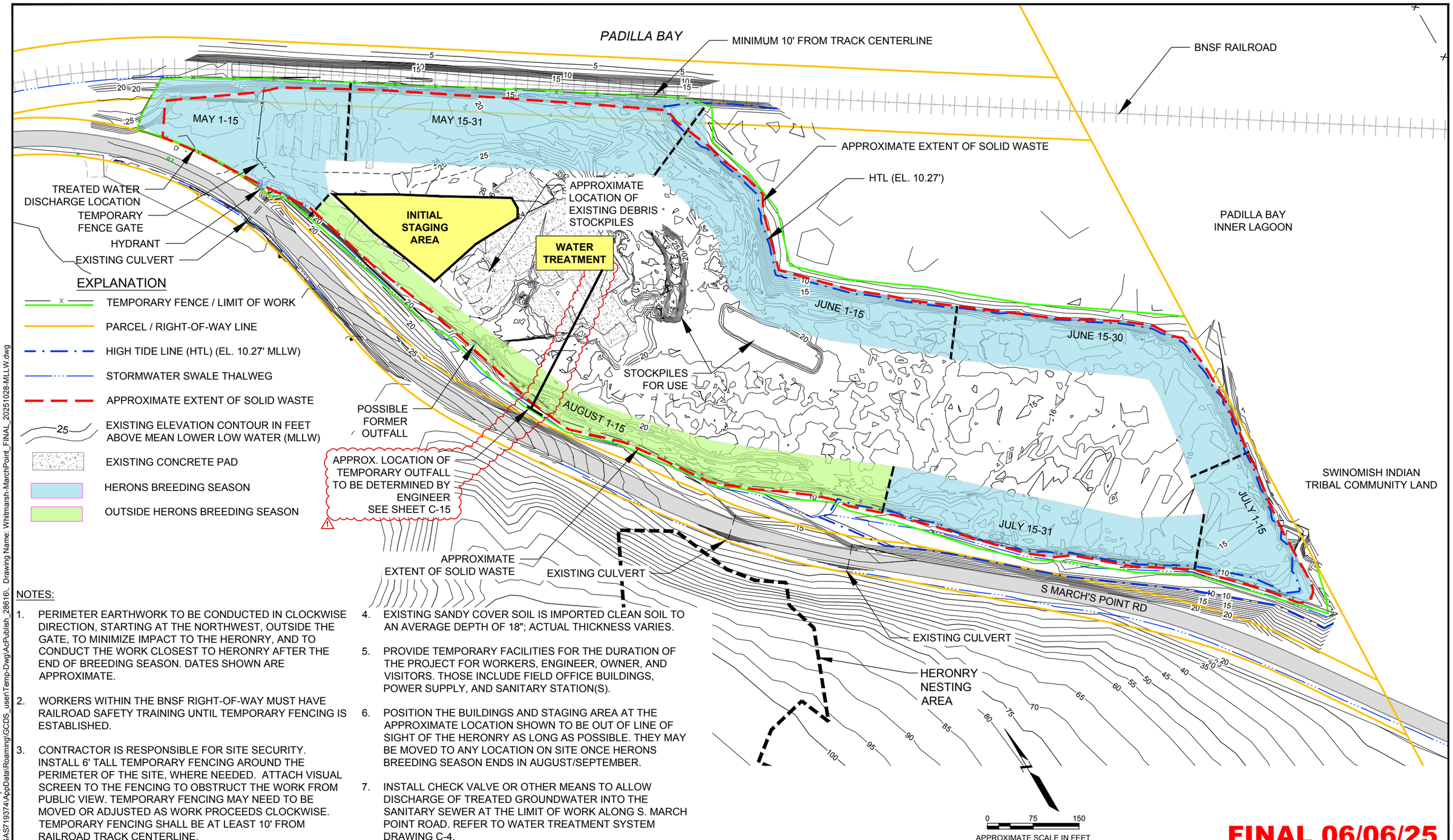
NOREUS TAHGTHLA — STATE OF WASHINGTON — 32840 — REGISTERED PROFESSIONAL ENGINEER

EXISTING UTILITIES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING G-4

Plot Date: 11/06/25 - 8:37am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



NOTES:

1. PERIMETER EARTHWORK TO BE CONDUCTED IN CLOCKWISE DIRECTION, STARTING AT THE NORTHWEST, OUTSIDE THE GATE, TO MINIMIZE IMPACT TO THE HERONRY, AND TO CONDUCT THE WORK CLOSEST TO HERONRY AFTER THE END OF BREEDING SEASON. DATES SHOWN ARE APPROXIMATE.
2. WORKERS WITHIN THE BNSF RIGHT-OF-WAY MUST HAVE RAILROAD SAFETY TRAINING UNTIL TEMPORARY FENCING IS ESTABLISHED.
3. CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY. INSTALL 6' TALL TEMPORARY FENCING AROUND THE PERIMETER OF THE SITE, WHERE NEEDED. ATTACH VISUAL SCREEN TO THE FENCING TO OBSTRUCT THE WORK FROM PUBLIC VIEW. TEMPORARY FENCING MAY NEED TO BE MOVED OR ADJUSTED AS WORK PROCEEDS CLOCKWISE. TEMPORARY FENCING SHALL BE AT LEAST 10' FROM RAILROAD TRACK CENTERLINE.
4. EXISTING SANDY COVER SOIL IS IMPORTED CLEAN SOIL TO AN AVERAGE DEPTH OF 18"; ACTUAL THICKNESS VARIES.
5. PROVIDE TEMPORARY FACILITIES FOR THE DURATION OF THE PROJECT FOR WORKERS, ENGINEER, OWNER, AND VISITORS. THOSE INCLUDE FIELD OFFICE BUILDINGS, POWER SUPPLY, AND SANITARY STATION(S).
6. POSITION THE BUILDINGS AND STAGING AREA AT THE APPROXIMATE LOCATION SHOWN TO BE OUT OF LINE OF SIGHT OF THE HERONRY AS LONG AS POSSIBLE. THEY MAY BE MOVED TO ANY LOCATION ON SITE ONCE HERONS BREEDING SEASON ENDS IN AUGUST/SEPTEMBER.
7. INSTALL CHECK VALVE OR OTHER MEANS TO ALLOW DISCHARGE OF TREATED GROUNDWATER INTO THE SANITARY SEWER AT THE LIMIT OF WORK ALONG S. MARCH POINT ROAD. REFER TO WATER TREATMENT SYSTEM DRAWING C-4.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1	NEW TEMPORARY OUTFALL	05/19/25	KT

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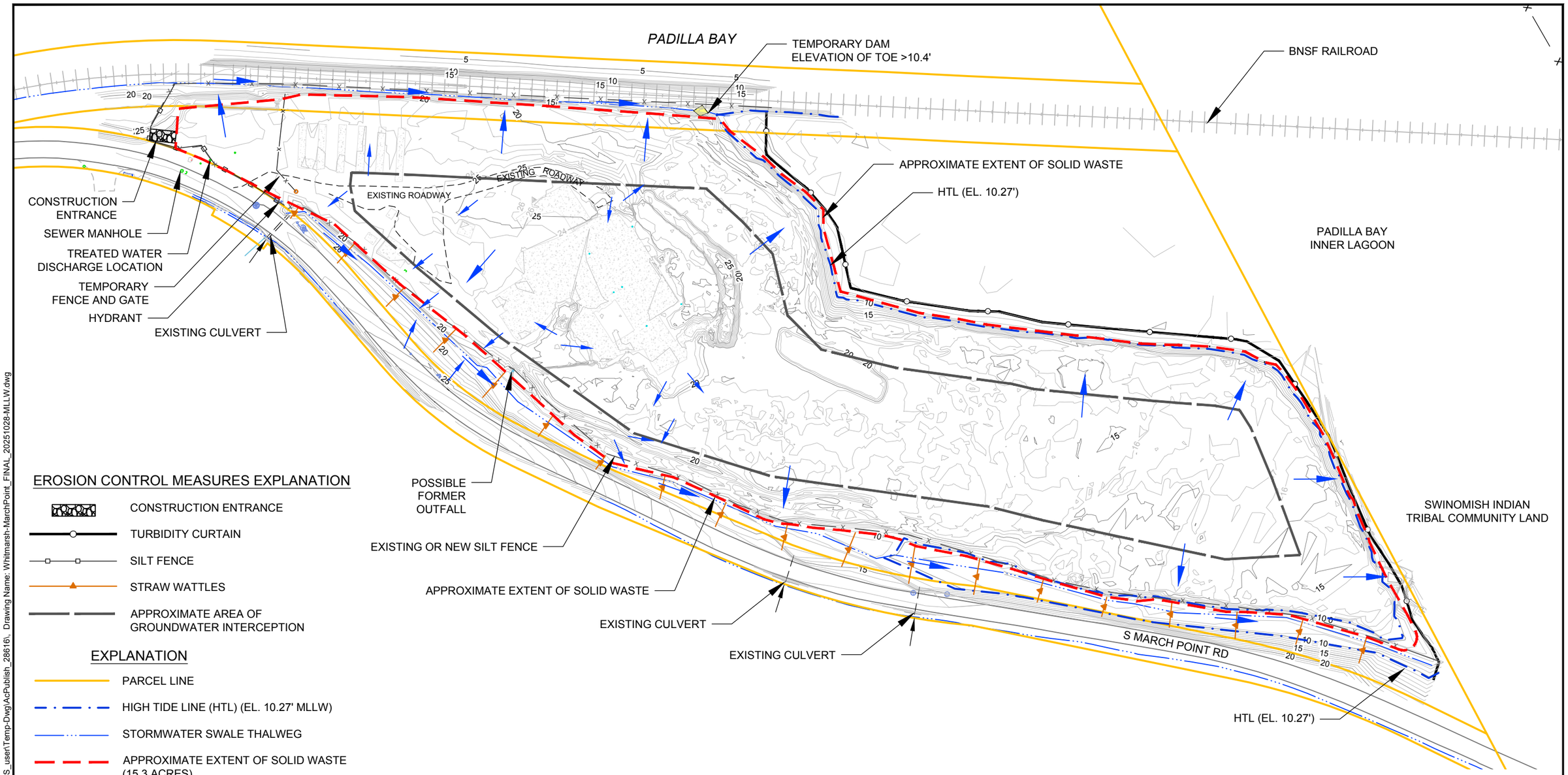
NOORUS TAHGIMAT STATE OF WASHINGTON 32240 REGISTERED PROFESSIONAL ENGINEER

SITE SETUP

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-1

Plot Date: 11/06/25 - 8:37am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



EROSION CONTROL MEASURES EXPLANATION

- CONSTRUCTION ENTRANCE
- TURBIDITY CURTAIN
- SILT FENCE
- STRAW WATTLES
- APPROXIMATE AREA OF GROUNDWATER INTERCEPTION

EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- TEMPORARY FENCE
- EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING CONCRETE PAD
- SURFACE FLOW DIRECTION

NOTES:

1. PROVIDE CESCL-CERTIFIED INSPECTOR DURING CONSTRUCTION.
2. SEE DRAWING C-3 FOR EROSION CONTROL NOTES.

0 75 150

APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
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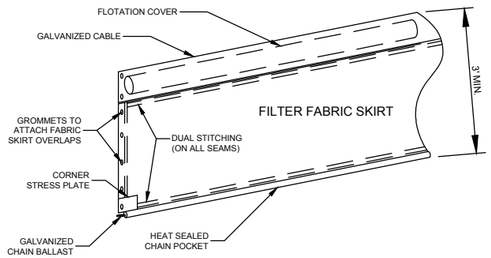
TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

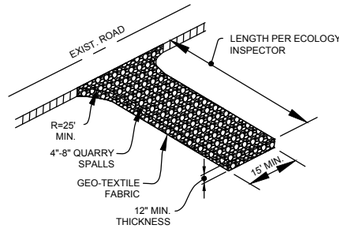
DRAWING C-2

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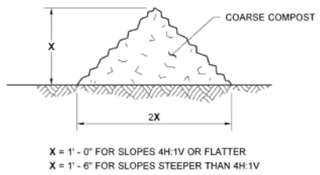
NOTES:
1. THIS DRAWING IS AN EXAMPLE ONLY.
2. FLOATS, BUOYS, LIGHTS, LINES, AND ANCHORS NOT SHOWN.
3. REFER TO MANUFACTURER'S SPECIFICATIONS FOR TURBIDITY CURTAIN REQUIREMENTS.
4. CONTRACTOR SHALL WORK WITH MANUFACTURER TO DESIGN TURBIDITY CURTAIN FOR SPECIFIC SITE CONDITIONS. SUBMIT DESIGN INFORMATION FOR ENGINEER'S APPROVAL IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
5. INSTALL AND MAINTAIN TURBIDITY CURTAIN PER MANUFACTURER INSTRUCTIONS.
6. ADDITIONAL FLOTATION AND BALLAST SHALL BE ADDED AS NEEDED TO FULLY CONTAIN TURBID WATER WITHIN THE WORK AREA AT ALL TIMES.
7. TURBIDITY CURTAIN IS TO BE KEPT IN WORKING CONDITION AT ALL TIMES. CONTRACTOR SHALL KEEP A REPAIR KIT ON-SITE AND ANY DAMAGE TO TURBIDITY CURTAIN SHALL BE REPAIRED IMMEDIATELY TO THE EXTENT PRACTICABLE. DAMAGED COMPONENTS THAT CAN NOT BE REPAIRED SHALL BE REPLACED.

1. TURBIDITY CURTAIN N.T.S.



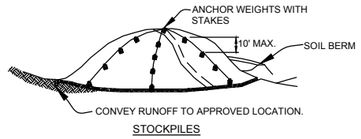
REFER TO WSDOT STANDARD PLAN I-80.10.02

2. CONSTRUCTION ENTRANCE N.T.S.

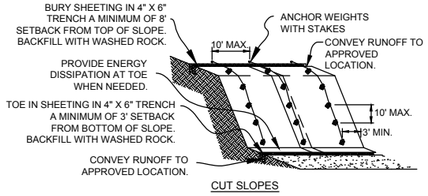


REFER TO WSDOT STANDARD PLAN I-80.10.02

4. COMPOST BERM N.T.S.

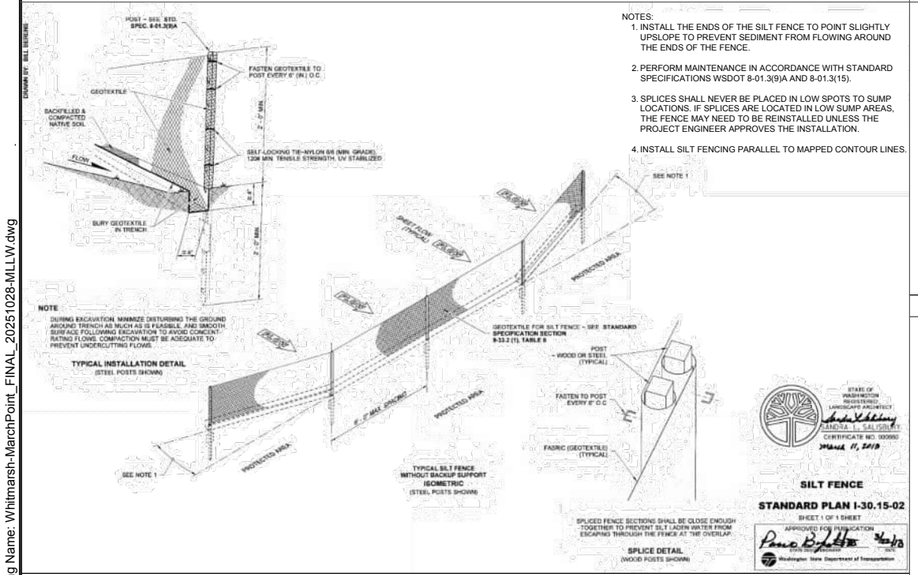


STOCKPILES



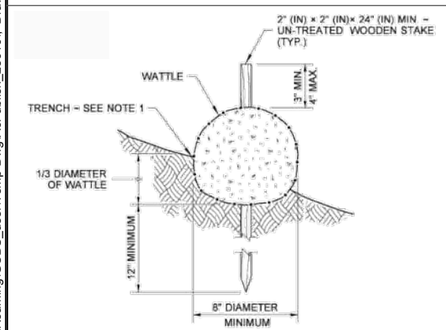
CUT SLOPES

6. PLASTIC COVERING N.T.S.



NOTES:
1. INSTALL THE ENDS OF THE SILT FENCE TO POINT SLIGHTLY UPSLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
2. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATIONS WSDOT 8-01.3(9)A AND 8-01.3(15).
3. SPLICES SHALL NEVER BE PLACED IN LOW SPOTS TO SUMP LOCATIONS. IF SPLICES ARE LOCATED IN LOW SUMP AREAS, THE FENCE MAY NEED TO BE REINSTALLED UNLESS THE PROJECT ENGINEER APPROVES THE INSTALLATION.
4. INSTALL SILT FENCING PARALLEL TO MAPPED CONTOUR LINES.

3. SILT FENCE N.T.S.



NOTES:
1. WATTLES SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION, SECTION 9-14.5(5). INSTALL STRAW WATTLES ACROSS THE SWALE. INSTALLATION SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION, SECTION 8-01.3(10).
2. SECURELY KNOT EACH END OF WATTLE. OVERLAP ADJACENT WATTLE ENDS 12"(IN) BEHIND ONE ANOTHER AND SECURELY TIE TOGETHER.
3. COMPACT EXCAVATED SOIL AND TRENCHES TO PREVENT UNDERCUTTING. ADDITIONAL STAKING MAY BE NECESSARY TO PREVENT UNDERCUTTING.
4. INSTALL WATTLE PERPENDICULAR TO FLOW ALONG CONTOURS.
5. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF. TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
6. PERFORM MAINTENANCE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS, SECTION 8-01.3(15)
7. REFER TO WSDOT STANDARD SPECIFICATIONS, SECTION 8-01.3(16) FOR REMOVAL.

REFER TO WSDOT STANDARD PLAN I-30.30.02

5. STRAW WATTLE N.T.S.

N.T.S. = NOT TO SCALE
APPROXIMATE SCALE IN FEET
0 - - NTS

TESC NOTES:

1. THE TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL (TESC) MEASURES ON THE PLANS ARE MINIMUM REQUIREMENTS.
2. BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES, ESTABLISH THE CLEARING LIMITS, INSTALL CONSTRUCTION ENTRANCE, AND INSTALL TESC MEASURES.
3. BEFORE ANY GROUND DISTURBANCE OCCURS, ALL DOWNSTREAM TESC MEASURES MUST BE CONSTRUCTED AND IN OPERATION.
4. TESC MEASURES, INCLUDING ALL PERIMETER CONTROLS, SHALL REMAIN IN PLACE OR RELOCATED, AND MAINTAINED UNTIL FINAL SITE CONSTRUCTION IS COMPLETED AND PERMANENT STABILIZATION IS ESTABLISHED.
5. FROM MAY 1 THROUGH OCTOBER 31, PROVIDE TEMPORARY AND PERMANENT COVER MEASURES TO PROTECT DISTURBED AREAS THAT WILL REMAIN UNWORKED FOR SEVEN DAYS OR MORE.
6. DURING THE WET SEASON (NOV. 1 - APR. 30), PROVIDE TEMPORARY AND PERMANENT COVER TO PROTECT DISTURBED AREAS THAT WILL REMAIN UNWORKED FOR TWO DAYS OR MORE. ADDITIONALLY:
   A. PROTECT STOCKPILES AND STEEP CUT AND FILL SLOPES IF UNWORKED FOR MORE THAN 12 HOURS.
   B. STOCKPILE, ON SITE, ENOUGH COVER MATERIALS TO COVER ALL DISTURBED AREAS.
   C. BY OCTOBER 8, SEED ALL AREAS THAT WILL REMAIN UNWORKED DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30). MULCH ALL SEEDED AREAS OR IMPLEMENT SIMILAR MEASURES.
7. DURING THE PROJECT, MAINTAIN IN GOOD CONDITION AND PROMPTLY REPAIR, RESTORE, OR REPLACE ALL GRADE SURFACES, DRAINS, DAMS, VEGETATION, EROSION AND SEDIMENT CONTROL MEASURES, AND OTHER PROTECTIVE DEVICES IN ACCORDANCE WITH APPROVED PLANS.
8. MONITOR DOWNSTREAM DRAINAGE FEATURES AND REMOVE ALL SEDIMENT DEPOSITION RESULTING FROM PROJECT RELATED WORK.
9. ALL WORK PERFORMED SHALL BE PER APPROVED PLANS AND SPECIFICATIONS. MAINTAIN A SET OF APPROVED PLANS AND SPECIFICATIONS AND ASSOCIATED PERMITS ON THE JOB SITE. PERFORM WORK IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS.
10. PROTECT SENSITIVE AREAS, THEIR BUFFERS, AND ADJACENT PRIVATE PROPERTIES AND PUBLIC RIGHTS-OF-WAY OR EASEMENTS FROM DAMAGE DURING GRADING OPERATIONS. RESTORE, TO THE STANDARDS IN EFFECT AT THE TIME OF THE ISSUANCE OF THE PERMIT, SENSITIVE AREAS, THEIR BUFFERS, AND PUBLIC AND PRIVATE PROPERTIES AND IMPROVEMENTS DAMAGED BY OPERATIONS.
11. COMPLY WITH THE FOLLOWING:
   A. NOTIFY THE ENGINEER WITHIN 48 HOURS FOLLOWING INSTALLATION OF TESC MEASURES.
   B. OBTAIN PERMISSION FROM THE ENGINEER PRIOR TO MODIFYING THE TESC PLAN.
   C. MAINTAIN ALL ROAD DRAINAGE SYSTEMS, STORM WATER DRAINAGE SYSTEMS, CONTROL MEASURES AND OTHER FACILITIES.
   D. REPAIR ANY SILTATION OR EROSION DAMAGES TO ADJOINING PROPERTIES AND DRAINAGE FACILITIES.
   E. INSPECT ACCORDING TO THE APPROVED TESC INSPECTION SCHEDULE SPECIFIED IN CONSTRUCTION STORMWATER DISCHARGE PERMIT AND MAKE NEEDED REPAIRS IMMEDIATELY.

SLOPE STABILIZATION:
1. SHREDDED BARK MULCH SHALL BE APPLIED TO EXPOSED SOILS AT ELEVATION +10.27' MLLW OR HIGHER WITHIN TWO DAYS UPON COMPLETION OF FINAL GRADING.
2. EXCAVATION, GRADING, AND PLACEMENT OF FILL BELOW ELEVATION 10.27' MLLW SHALL BE COORDINATED WITH TIDAL INUNDATIONS TO MINIMIZE SUSPENSION OF SEDIMENT. SLOPES AT ELEVATIONS LOWER THAN 10.27' MLLW SHALL BE NO STEEPER THAN 4H:1V WHEN SUBJECT TO TIDAL INUNDATION.
3. TEMPORARY AND PERMANENT SLOPES STEEPER THAN 3H:1V SHALL BE ROUGHENED BY "TRACK WALKING" CRAWLER EQUIPMENT UP AND DOWN THE SLOPE.
4. INSTALL SLOPE STABILIZATION MEASURES IN ACCORDANCE WITH LANDSCAPING PLAN AND SPECIFICATIONS AS SOON AS PRACTICABLE UPON COMPLETION OF GRADING.
5. UPON COMPLETION OF GRADING, IMPLEMENT SURFACE ROUGHENING, THEN PROVIDE AND MAINTAIN TEMPORARY SEED AND MULCH ABOVE ELEVATION 10.27' MLLW UNTIL PERMANENT LANDSCAPING IS INSTALLED.

PERIMETER CONTROLS
1. INSTALL TESC MEASURES PRIOR TO EARTH DISTURBING ACTIVES TO ISOLATE WORK AREAS FROM ADJACENT PROPERTIES AND TO PREVENT RUNOFF FROM ENTERING OR LEAVING THE SITE, WHEN POSSIBLE.
2. MAINTAIN THE TURBIDITY CURTAIN AND OTHER MEASURES DURING THE WORK SUCH THAT THEY ARE EFFECTIVE. REPLACE DAMAGED MEASURES TO MAINTAIN GOOD WORKING ORDER.
3. MODIFY, RELOCATE, OR ADD EROSION CONTROL MEASURES TO ACHIEVE THE OBJECTIVE OF MINIMIZING ENTRY OF SEDIMENT INTO THE BAY.

TEMPORARY STOCKPILES:
1. WHERE EROSION OF MATERIAL CAN OCCUR, TEMPORARY STOCKPILES SHALL BE LINED UNDERNEATH AND SURROUNDED BY EARTH DIKES AND COVERED WITH 10 MIL PLASTIC COVERING. RUNOFF COLLECTED IN STOCKPILE AREAS SHALL BE ROUTED TO THE STORMWATER HOLDING TANKS.

TIRE WASH:
1. TIRE WASH FACILITIES MAY BE NEEDED AT SITE EGRESS LOCATIONS WHERE SEDIMENT MAY BE TRACKED ONTO PAVED ROADS BY VEHICLES. THE CONTRACTOR SHALL DESIGN AND IMPLEMENT TIRE WASH FACILITIES IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS AND PERMITS FOR TIRE WASH FACILITIES.

DEWATERING, TREATMENT AND DISCHARGE:
1. REMOVE GROUNDWATER TO CONDUCT THE WORK AND TO PREVENT DISCHARGE OF GROUNDWATER INTO THE BAY DURING EARTHWORK ALONG THE PERIMETER.
2. GROUNDWATER EXTRACTION MAY BE FROM A TRENCH OR PITS ALONG THE APPROXIMATE ALIGNMENT SHOWN ON DRAWING C-2. PUMP THE WATER TO THE SETTLING TANKS OF THE WATER TREATMENT SYSTEM.
3. COLLECT AND TREAT ALL WATER GENERATED ON SITE (STORMWATER AND GROUNDWATER) AND DISCHARGE INTO THE SANITARY SEWER.
4. THE ENGINEER WILL TEST THE TREATED WATER. DISCHARGE THE TREATED WATER ONLY AFTER RECEIVING APPROVAL FROM THE ENGINEER. TREATED WATER NOT MEETING THE ALLOWABLE DISCHARGE LIMITS SHALL BE TREATED AGAIN.

POST CONSTRUCTION SOIL MANAGEMENT:
1. HYDROSEED THE COMPLETED SURFACES AND PLANT VEGETATION IN ACCORDANCE WITH THE RESTORATION PLANS.

TESC PLAN SUPPLEMENTAL INFORMATION:
1. RESTORE THE STAGING AREA(S) UPON DEMOBILIZATION.
2. PREVENT DEBRIS FROM ENTERING THE BAY TO THE MAXIMUM EXTENT PRACTICABLE. REMOVE ANY SUCH DEBRIS DAILY, OR AS INSTRUCTED BY THE ENGINEER.
3. COORDINATE TIMING OF EXCAVATION, AND GRADING WITH TIDAL AND SWALE LEVEL FLUCTUATION TO MINIMIZE RELEASE OF DEBRIS AND SEDIMENT.
4. WHEN WORKING WITHIN THE TIDAL ZONE, LIMIT THE AREA OF GRADING AND EXCAVATION TO THAT WHICH CAN BE PERFORMED AND STABILIZED WITHIN A SINGLE TIDAL CYCLE, BEFORE WATER RISES TO ELEVATION 8.0' MLLW.
5. ADDITIONAL TESC MEASURES MAY BE NEEDED AT DIFFERENT STAGES OF WORK. MODIFY AS NEEDED TO MEET THE INTENT OF THE STORMWATER POLLUTION PREVENTION PLAN.
6. USE TEMPORARY PUMPS AND HOSES TO TRANSFER GROUNDWATER AND STORMWATER TO THE HOLDING TANKS.
7. CLEAN ROADWAYS IF ANY SOILS HAS TRACKED OUTSIDE THE WORK AREA.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1			

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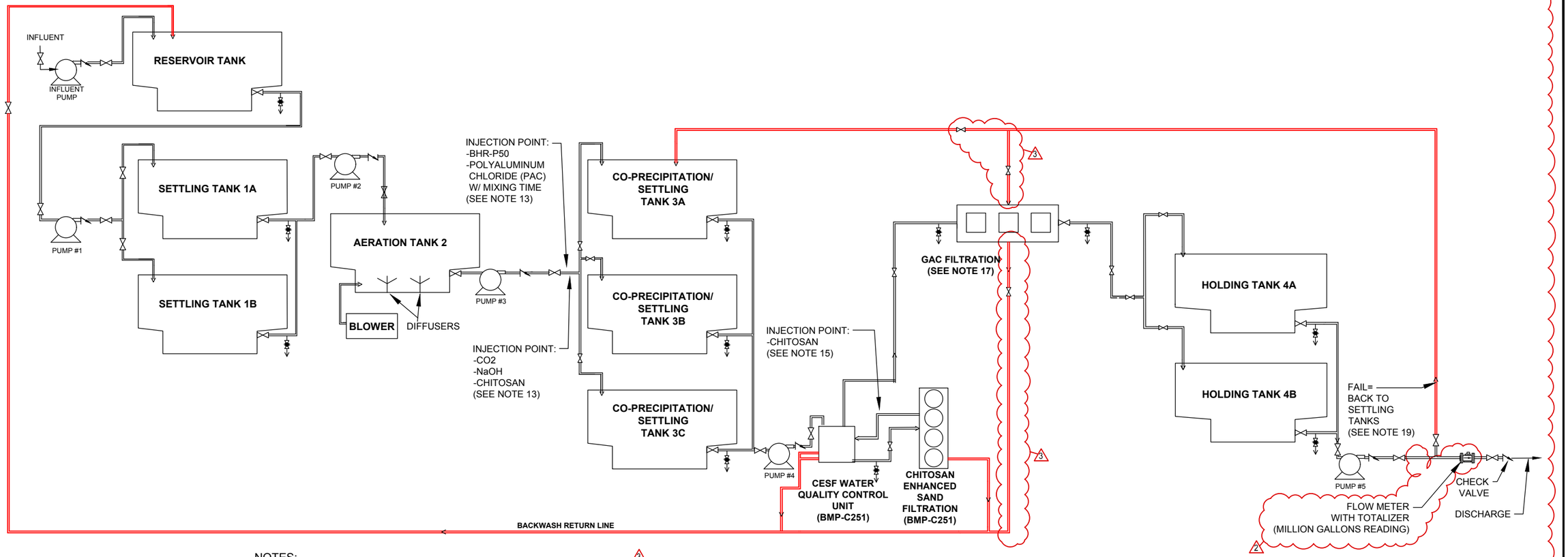
WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

ACORUS TAHGHLEH STATE OF WASHINGTON 32240 REGISTERED PROFESSIONAL ENGINEER

TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) NOTES AND DETAILS
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-3

Plot Date: 11/06/25 - 8:38am. Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



VALVE

SAMPLE POINT

CHECK VALVE

PRESSURE GAUGE

PRIMARY PROCESS FLOW

SECONDARY FLOW

ACRONYMS:

BMPs	Best Management Practices
CO_2	Carbon Dioxide
GAC	Granular Activated Carbon
GPM	Gallons Per Minute
NaOH	Sodium Hydroxide

NOTES:

1. ALL TANKS SHALL BE 20,000 GALLON OPEN TOP TANKS. INFLUENT AND EFFLUENT PIPE DOWNCOMERS OR TANK BAFFLING SHALL BE USED IN ALL TANKS EXCEPT THE RESERVOIR TANK TO PREVENT SHORT CIRCUITING AND/OR TO MAINTAIN TANK LEVEL.
2. MAXIMUM FLOW OF SYSTEM SHALL BE 300 GALLONS PER MINUTE (GPM), UNLESS ALTERNATE FLOW RATE IS APPROVED BY THE ENGINEER.
3. FLOW METER FLOW RANGE SHALL BE 0 TO 400 GPM.
4. VALVES AND SAMPLE PORTS SHALL BE MADE OF RUST-PROOF METAL.
5. INSTALL, OPERATE, AND MAINTAIN THE SYSTEM STARTING THE DAY THE ENGINEER AUTHORIZES ITS OPERATION UNTIL THE ENGINEER INSTRUCTS TO DISCONTINUE.
6. RELOCATE THE SYSTEM AS NEEDED TO COMPLETE THE WORK.
7. THE ENGINEER WILL OBTAIN DISCHARGE PERMIT. ENGINEER WILL COLLECT AND ANALYZE WATER SAMPLES. CONTRACTOR SHALL ASSUME THAT ONLY BATCH DISCHARGES MAY BE MADE.
8. THE ENGINEER WILL OBTAIN APPROVAL TO DISCHARGE FROM THE CITY AND WILL NOTIFY CONTRACTOR. IF CITY DOES NOT APPROVE DISCHARGE, RETURN THE WATER TO THE SETTLING TANK AND TREAT AGAIN.
9. CLEAN AND DECONTAMINATE ALL COMPONENTS AT THE COMPLETION OF PROJECT. ENGINEER WILL COLLECT CONFIRMATION SAMPLES.
10. RESERVOIR TANK IS FOR MANAGEMENT OF SURGE FLOWS. TANKS 1 A/B ARE FOR COLLECTION AND FOR PRE-SETTLEMENT OF MATERIAL FROM THE SUMPS. FLOWS SHALL BE SPLIT INTO TWO OR ONE AND CAN BE ISOLATED DURING OPERATION FOR MAINTENANCE CLEANING. SIGNIFICANT SOLIDS EXPECTED TO SETTLE IN TANKS 1 A/B, REQUIRING FREQUENT MAINTENANCE TO EMPTY TANKS AND DISPOSE OF SOLIDS.
11. AERATION TANK 2 RECEIVES EFFLUENT FROM TANKS 1 A/B, AND IRON IS OXIDIZED. AERATION IS ACHIEVED WITH BLOWER OR COMPRESSOR AND AIR DIFFUSERS OR APPROVED EQUAL.
12. PUMPS #1, #2, #3, #4, AND #5 ARE 4" PUMPS PROTECTED FROM DRY OPERATION (E.G., LEVEL PROTECTION, DRI-PRIME DIESELS, ETC.).
13. PUMP #3 DISCHARGE LINE HAS CHEMICAL INJECTION POINTS FOR BHR-P50 AND POLYALUMINUM CHLORIDE (PAC), AND THEN +/-100' OF 6" LINE BEFORE A SECOND SERIES OF INJECTION POINTS FOR CO2 AND NaOH TO BE USED FOR pH ADJUSTMENT (AS NEEDED) AND 1% CHITOSAN TO HELP BUILD FLOC PRIOR TO DISCHARGE INTO THE TANKS. STATIC MIXERS WILL BE USED FOR INJECTION AND MIXING.
14. TANKS 3 A/B/C ARE USED FOR CO-PRECIPITATION OF METALS AND PRIMARY PRE-TREATMENT FOR THE CESF SYSTEM. SIGNIFICANT SOLIDS EXPECTED TO SETTLE IN TANKS 3 A/B/C, REQUIRING FREQUENT MAINTENANCE TO EMPTY TANKS AND DISPOSE OF SOLIDS.
15. THE CESF (CHITOSAN ENHANCED SAND FILTRATION) CONTROL BOX MEETS THE ECOLOGY REQUIREMENTS FOR THE FLOW-THROUGH DISCHARGE TO WATERS OF THE STATE, AND CAN ALSO DOSE CHITOSAN BEFORE THE SAND FILTER. IT IS FULLY AUTOMATED AND AUTOMATICALLY DOSES THE CHEMICALS, VALIDATES CESF EFFLUENT WATER QUALITY, BACKWASHES AND SENDS BACKWASH BACK TO THE RESERVOIR TANK, AND FEEDS THE GAC FILTERS. CHITOSAN IS INJECTED AND MIXED VIA INLINE STATIC MIXER.
16. THE MINIMUM SIZED SAND FILTER IN THIS 300 GPM CONFIGURATION IS A 48" X 4 POD (THIS FILTER HAS AN OPERATIONAL FLOW RATE OF MORE THAN 450 GPM, BUT FOR THIS APPLICATION THE LARGER SAND BED PROVIDES A MORE SUSTAINABLE OPERATION.
17. THREE 10,000 POUNDS (5 TON) CARBON MEDIA COLUMNS WITH 12 x 40 MESH SET IN SERIES OR LEAD/LAG CONFIGURATION PROVIDES SUFFICIENT EMPTY BED CONTACT TIME AND BREAKTHROUGH PROTECTION. FACE PIPING AND VALVING INCLUDING BACKWASHING TO BE INCLUDED WITH GAC PACKAGE. THE POINT OF COMPLIANCE WOULD BE THE SAMPLE PORT AFTER THE SECOND UNIT. THE EMPTY BED CONTACT TIME SHOULD BE GREATER THAN 12 MINUTES AND THE HYDRAULIC LOADING RATE SHOULD BE BETWEEN 4 AND 10 GPM/FT^2.
18. SYSTEM SHALL HAVE AN OPERATOR CERTIFIED FOR OPERATION OF AN ENHANCED CHEMICAL TREATMENT SYSTEM.
19. IF FLOW IS RECYCLED BACK TO THE SETTLING TANKS, INFLUENT PUMPING SHALL BE ADJUSTED TO ENSURE MAXIMUM FLOW REQUIREMENTS ARE NOT EXCEEDED.

FINAL 12/05/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.	3	TECHNICAL AND TEXT REVISION	12/05/25	KT
VERTICAL DATUM: MLLW FT.	2	FLOW METER AND TOTALIZER MOVED	10/28/25	KT
	1	TREATMENT SYSTEM AND NOTES REVISED	05/19/25	KT

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

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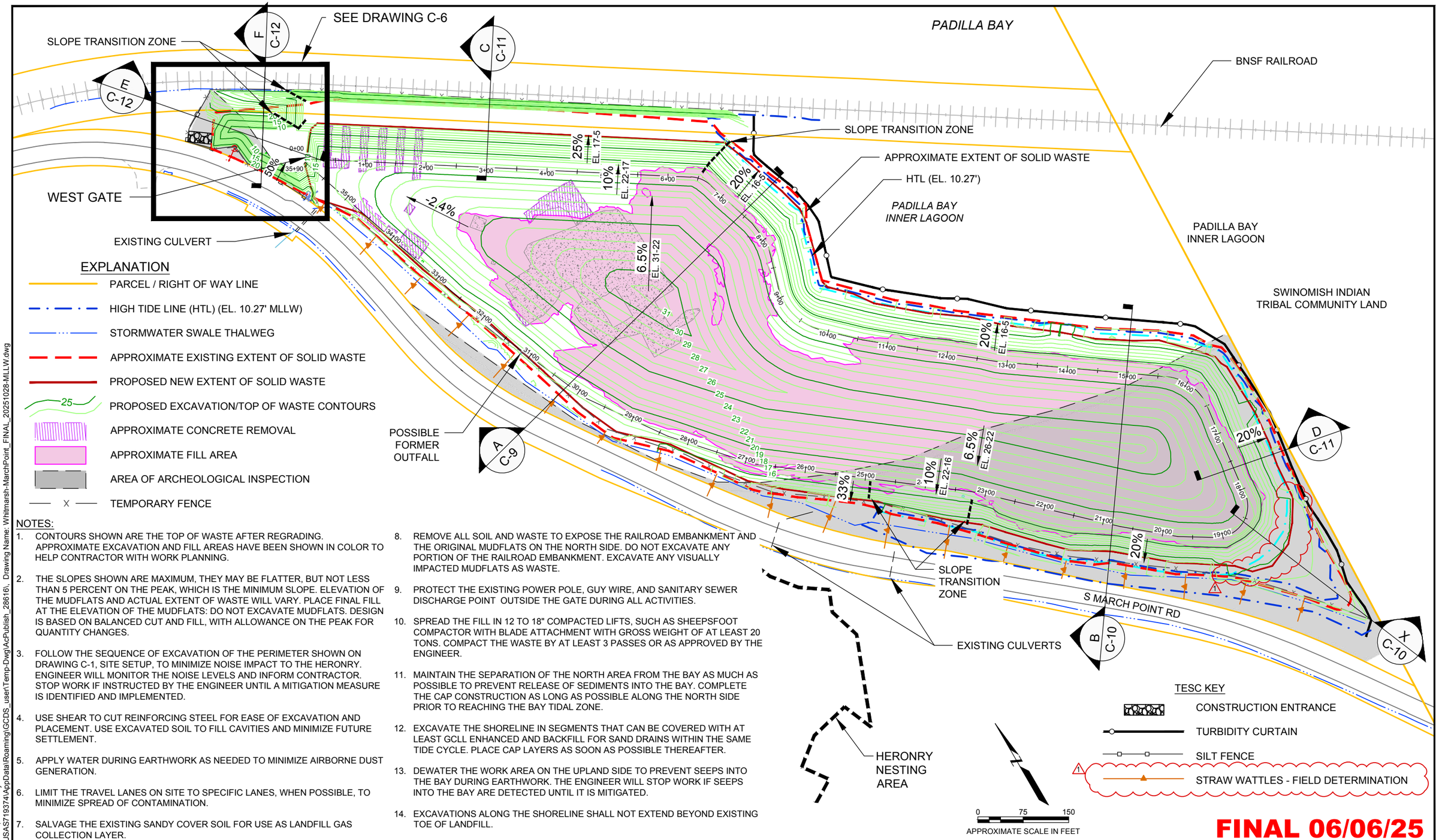
KORUS TAHGHGHI STATE OF WASHINGTON 22240 REGISTERED PROFESSIONAL ENGINEER

WATER TREATMENT SYSTEM

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 12/05/25
PROJECT NO.: PS21204410
DRAWING C-4

Plot Date: 12/05/25 - 8:12am Plotted by: USAS719374
Drawing Path: G:\Whitmarsh\Whitmarsh-MarchPoint_FINAL_20251028-MLLW - Standard\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



EXPLANATION

- PARCEL / RIGHT OF WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXISTING EXTENT OF SOLID WASTE
- PROPOSED NEW EXTENT OF SOLID WASTE
- 25 — PROPOSED EXCAVATION/TOP OF WASTE CONTOURS
- APPROXIMATE CONCRETE REMOVAL
- APPROXIMATE FILL AREA
- AREA OF ARCHEOLOGICAL INSPECTION
- —— X —— TEMPORARY FENCE

TESC KEY

- CONSTRUCTION ENTRANCE
- TURBIDITY CURTAIN
- SILT FENCE
- 1 STRAW WATTLES - FIELD DETERMINATION

NOTES:

1. CONTOURS SHOWN ARE THE TOP OF WASTE AFTER REGRADING. APPROXIMATE EXCAVATION AND FILL AREAS HAVE BEEN SHOWN IN COLOR TO HELP CONTRACTOR WITH WORK PLANNING.
2. THE SLOPES SHOWN ARE MAXIMUM, THEY MAY BE FLATTER, BUT NOT LESS THAN 5 PERCENT ON THE PEAK, WHICH IS THE MINIMUM SLOPE. ELEVATION OF THE MUDFLATS AND ACTUAL EXTENT OF WASTE WILL VARY. PLACE FINAL FILL AT THE ELEVATION OF THE MUDFLATS: DO NOT EXCAVATE MUDFLATS. DESIGN IS BASED ON BALANCED CUT AND FILL, WITH ALLOWANCE ON THE PEAK FOR QUANTITY CHANGES.
3. FOLLOW THE SEQUENCE OF EXCAVATION OF THE PERIMETER SHOWN ON DRAWING C-1, SITE SETUP, TO MINIMIZE NOISE IMPACT TO THE HERONRY. ENGINEER WILL MONITOR THE NOISE LEVELS AND INFORM CONTRACTOR. STOP WORK IF INSTRUCTED BY THE ENGINEER UNTIL A MITIGATION MEASURE IS IDENTIFIED AND IMPLEMENTED.
4. USE SHEAR TO CUT REINFORCING STEEL FOR EASE OF EXCAVATION AND PLACEMENT. USE EXCAVATED SOIL TO FILL CAVITIES AND MINIMIZE FUTURE SETTLEMENT.
5. APPLY WATER DURING EARTHWORK AS NEEDED TO MINIMIZE AIRBORNE DUST GENERATION.
6. LIMIT THE TRAVEL LANES ON SITE TO SPECIFIC LANES, WHEN POSSIBLE, TO MINIMIZE SPREAD OF CONTAMINATION.
7. SALVAGE THE EXISTING SANDY COVER SOIL FOR USE AS LANDFILL GAS COLLECTION LAYER.
8. REMOVE ALL SOIL AND WASTE TO EXPOSE THE RAILROAD EMBANKMENT AND THE ORIGINAL MUDFLATS ON THE NORTH SIDE. DO NOT EXCAVATE ANY PORTION OF THE RAILROAD EMBANKMENT. EXCAVATE ANY VISUALLY IMPACTED MUDFLATS AS WASTE.
9. PROTECT THE EXISTING POWER POLE, GUY WIRE, AND SANITARY SEWER DISCHARGE POINT OUTSIDE THE GATE DURING ALL ACTIVITIES.
10. SPREAD THE FILL IN 12 TO 18" COMPACTED LIFTS, SUCH AS SHEEPSFOOT COMPACTOR WITH BLADE ATTACHMENT WITH GROSS WEIGHT OF AT LEAST 20 TONS. COMPACT THE WASTE BY AT LEAST 3 PASSES OR AS APPROVED BY THE ENGINEER.
11. MAINTAIN THE SEPARATION OF THE NORTH AREA FROM THE BAY AS MUCH AS POSSIBLE TO PREVENT RELEASE OF SEDIMENTS INTO THE BAY. COMPLETE THE CAP CONSTRUCTION AS LONG AS POSSIBLE ALONG THE NORTH SIDE PRIOR TO REACHING THE BAY TIDAL ZONE.
12. EXCAVATE THE SHORELINE IN SEGMENTS THAT CAN BE COVERED WITH AT LEAST GCLL ENHANCED AND BACKFILL FOR SAND DRAINS WITHIN THE SAME TIDE CYCLE. PLACE CAP LAYERS AS SOON AS POSSIBLE THEREAFTER.
13. DEWATER THE WORK AREA ON THE UPLAND SIDE TO PREVENT SEEPS INTO THE BAY DURING EARTHWORK. THE ENGINEER WILL STOP WORK IF SEEPS INTO THE BAY ARE DETECTED UNTIL IT IS MITIGATED.
14. EXCAVATIONS ALONG THE SHORELINE SHALL NOT EXTEND BEYOND EXISTING TOE OF LANDFILL.

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
1	CORRECTED EXTENT OF SOLID WASTE AND TESC KEY	05/19/25	KT

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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NICHOLAS TAHGTIAN — STATE OF WASHINGTON — 22240 — REGISTERED PROFESSIONAL ENGINEER

TOP OF WASTE GRADES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-5

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg

UTILITY SURVEY LEGEND

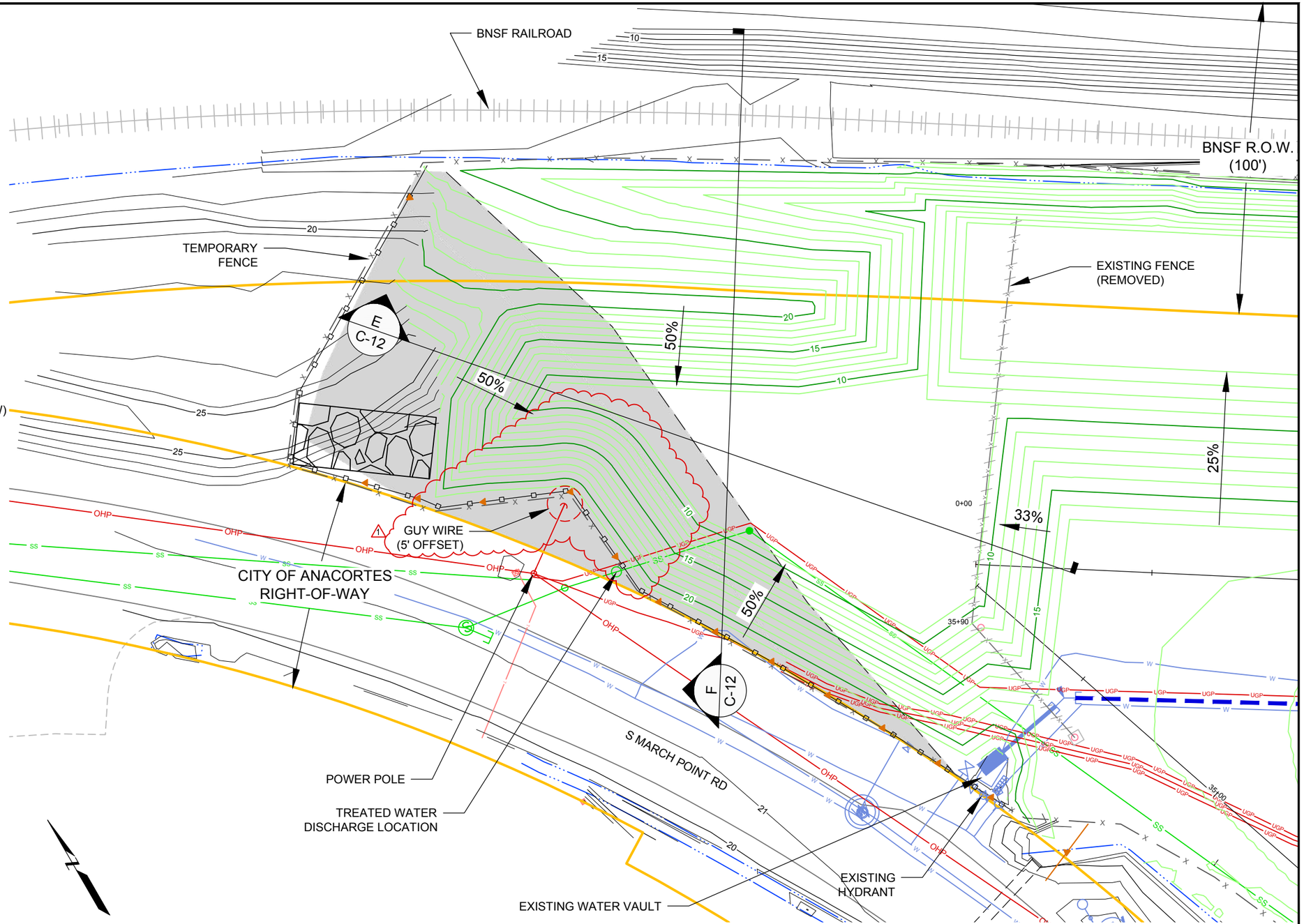
- SS — SEWER DRAIN
- W — WATER LINE
- FIRE LINE
- UGP — UNDERGROUND POWER LINE
- OHP — OVERHEAD POWER LINE
- T — TELEPHONE LINE

EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- STORMWATER SWALE THALWEG
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED EXCAVATION CONTOURS
- CONSTRUCTION ENTRANCE
- AREA OF ARCHEOLOGICAL INSPECTION
- X — TEMPORARY FENCE
- SILT FENCE
- STRAW WATTLES

NOTES:

1. THE EXISTING UTILITY LINES ARE SHOWN FOR REFERENCE. CONTRACTOR TO VERIFY THEY ARE DEACTIVATED AT THE START OF PROJECT.
2. SALVAGE EXISTING ABOVEGROUND EARTHEN BERM SOIL WITHIN LIMIT OF WORK TO BACKFILL EXCAVATION, OUTSIDE THE GATE.
3. DO NOT PLACE TEMPORARY FENCING OR EXCAVATE WITHIN THE CITY OF ANACORTES RIGHT-OF-WAY. THE BOUNDARY WILL BE STAKED BY THE ENGINEER.
4. PROTECT THE POWER POLE AND GUY WIRE DURING EXCAVATION; MAINTAIN A MINIMUM OF 3' SEPARATION DURING EXCAVATION.
5. EXCAVATE ANY SOLID WASTE OUTSIDE THE LANDFILL FENCE. EXCAVATE AT A STABLE SLOPE, ASSUMED TO BE APPROXIMATELY 50%, BUT MAY BE STEEPER IF STABLE.
6. SEQUENCE THE WORK TO MAINTAIN SITE ACCESS.
7. DEWATER EXCAVATION TO ACHIEVE COMPLETE REMOVAL OF SOLID WASTE OUTSIDE THE FENCE. PROCESS THE WATER THROUGH THE TREATMENT SYSTEM.
8. BACKFILL THE EXCAVATION WITH COMPACTED LAYERS OF SALVAGED BERM SOIL AND IMPORTED GRANULAR FILL TO APPROXIMATELY WITHIN 4" OF FINAL GRADE.



0 15 30

APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1	REVISED GRADING AROUND GUY WIRE	05/19/25	KT

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

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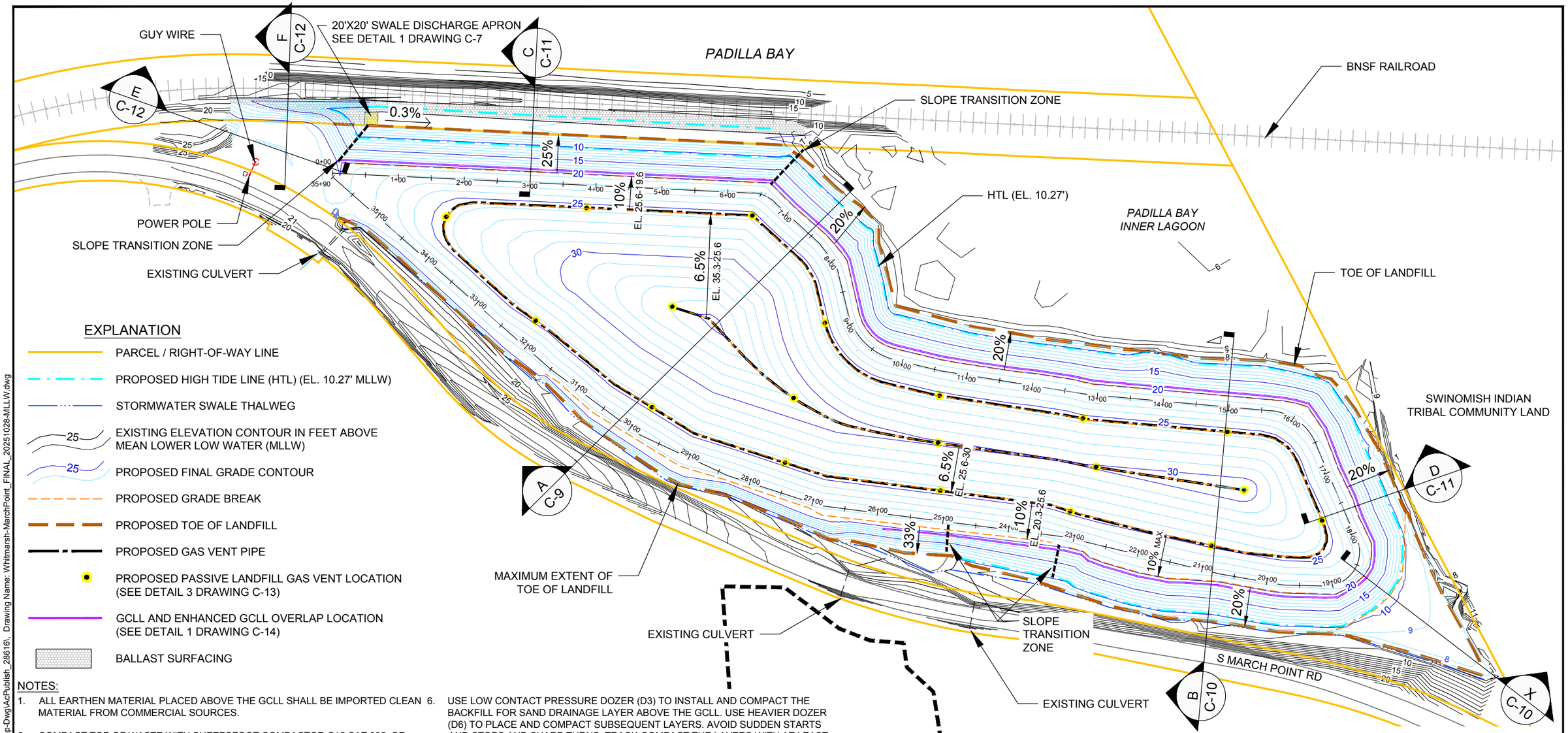
GATE ENTRANCE EXCAVATION

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING C-6

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg

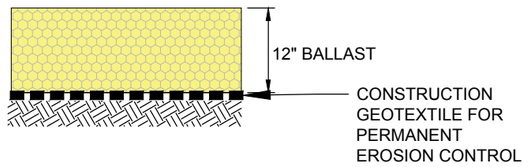


EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- PROPOSED HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED GAS VENT PIPE
- PROPOSED PASSIVE LANDFILL GAS VENT LOCATION (SEE DETAIL 3 DRAWING C-13)
- GCLL AND ENHANCED GCLL OVERLAP LOCATION (SEE DETAIL 1 DRAWING C-14)
- BALLAST SURFACING

NOTES:

1. ALL EARTHEN MATERIAL PLACED ABOVE THE GCLL SHALL BE IMPORTED CLEAN MATERIAL FROM COMMERCIAL SOURCES.
2. COMPACT TOP OF WASTE WITH SHEEPSFOOT COMPACTOR C15 CAT 825, OR EQUAL, BY AT LEAST 3 PASSES OR AS DIRECTED BY THE ENGINEER.
3. INSTALL LFG COLLECTION AND VENTING PIPES AT THE FIRST GRADE BREAK AND AT THE LANDFILL RIDGE.. ALLOW INSPECTION AND ACCEPTANCE OF THE LFG PIPING BY THE ENGINEER PRIOR TO COVERING IT.
4. USE THE SALVAGED SANDY COVER SOIL TO CONSTRUCT THE GAS COLLECTION LAYER (LFG) AND PIPING. TRACK-COMPACT THE SURFACE PRIOR TO PLACEMENT OF GCLL.
5. INSTALL THE GCLL FROM THE TOE UP AND SHINGLE THE SEPARATE PIECES TO THE TOP OF THE LANDFILL WITH MINIMUM 2' OF OVERLAP. INSTALL GCLL ENHANCED PARALLEL TO THE TO OF THE LANDFILL ALONG PERIMETER SLOPES. ELEVATION 16' ALONG THE SHORELINE IS THE LOCATION OF CHANGE FROM GCLL TO GCLL ENHANCED.
6. USE LOW CONTACT PRESSURE DOZER (D3) TO INSTALL AND COMPACT THE BACKFILL FOR SAND DRAINAGE LAYER ABOVE THE GCLL. USE HEAVIER DOZER (D6) TO PLACE AND COMPACT SUBSEQUENT LAYERS. AVOID SUDDEN STARTS AND STOPS AND SHARP TURNS. TRACK-COMPACT THE LAYERS WITH AT LEAST 3 PASSES, OR AS DIRECTED BY THE ENGINEER.
7. INSTALL A LAYER OF CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL PRIOR TO PLACEMENT OF SELECT BORROW LAYER.
8. COVER THE EXPOSED RAILROAD EMBANKMENT WITH A LAYER OF GCLL AND ADD A 12" LAYER OF BALLAST OVER IT AND DRESS.
9. FINAL CAP LAYER BELOW ELEVATION 10.27' ALONG THE WATER WAY SHALL BE BACKFILL FOR SAND DRAINS.
10. SEE CROSS SECTIONS AND DETAILS FOR THE CAP LAYERING AND RESTORATION DRAWINGS FOR PLANTINGS AND HYDROSEED OF THE SURFACE.



1 SWALE DISCHARGE APRON DETAIL
NOT TO SCALE

0 75 150
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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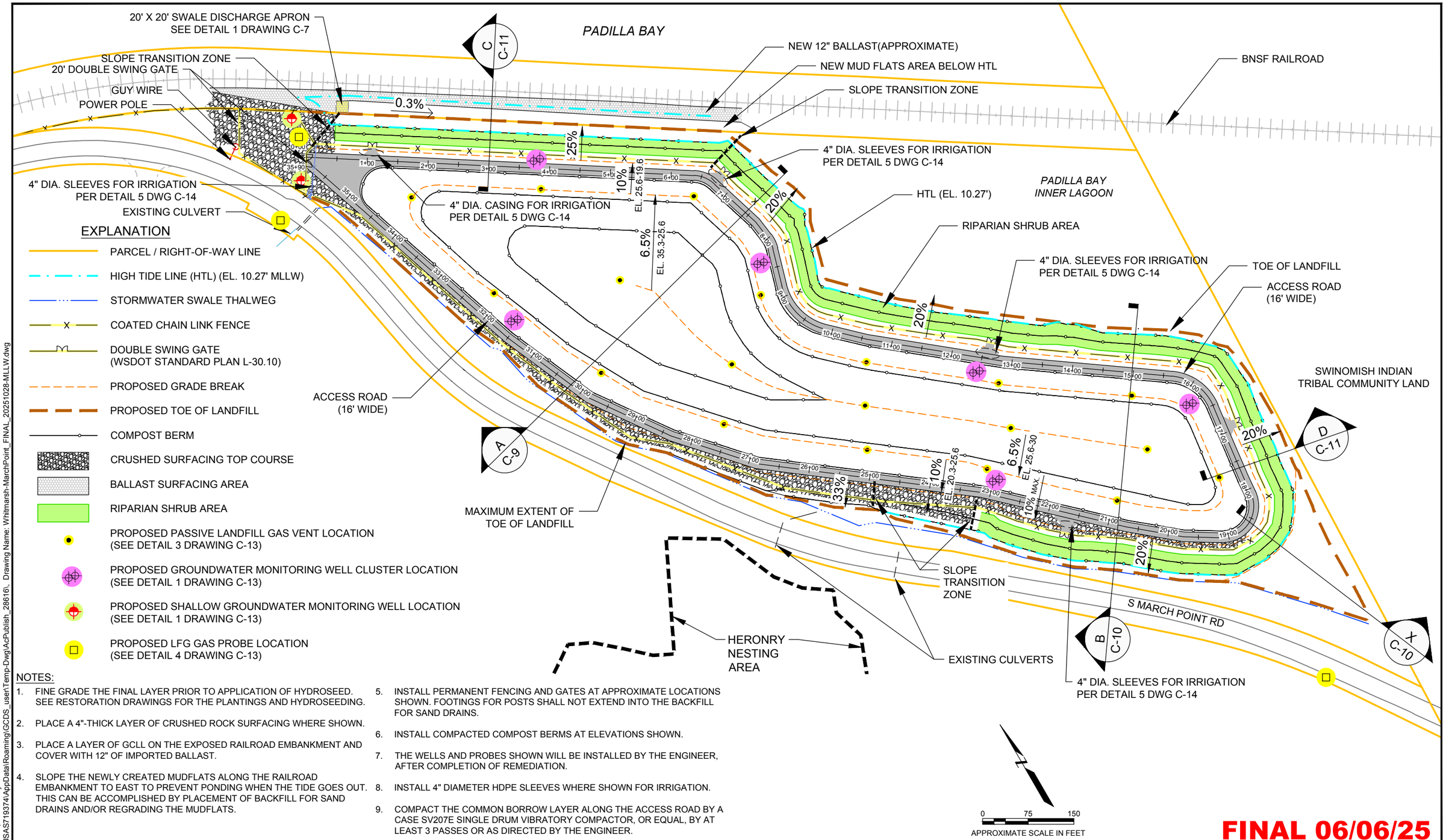
KOORUS TAHGICHI STATE OF WASHINGTON 22240 REGISTERED PROFESSIONAL ENGINEER

FINAL GRADING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-7

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- COMPOST BERM
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PROPOSED PASSIVE LANDFILL GAS VENT LOCATION (SEE DETAIL 3 DRAWING C-13)
- PROPOSED GROUNDWATER MONITORING WELL CLUSTER LOCATION (SEE DETAIL 1 DRAWING C-13)
- PROPOSED SHALLOW GROUNDWATER MONITORING WELL LOCATION (SEE DETAIL 1 DRAWING C-13)
- PROPOSED LFG GAS PROBE LOCATION (SEE DETAIL 4 DRAWING C-13)

NOTES:

1. FINE GRADE THE FINAL LAYER PRIOR TO APPLICATION OF HYDROSEED. SEE RESTORATION DRAWINGS FOR THE PLANTINGS AND HYDROSEEDING.
2. PLACE A 4"-THICK LAYER OF CRUSHED ROCK SURFACING WHERE SHOWN.
3. PLACE A LAYER OF GCLL ON THE EXPOSED RAILROAD EMBANKMENT AND COVER WITH 12" OF IMPORTED BALLAST.
4. SLOPE THE NEWLY CREATED MUDFLATS ALONG THE RAILROAD EMBANKMENT TO EAST TO PREVENT PONDING WHEN THE TIDE GOES OUT. THIS CAN BE ACCOMPLISHED BY PLACEMENT OF BACKFILL FOR SAND DRAINS AND/OR REGRADING THE MUDFLATS.
5. INSTALL PERMANENT FENCING AND GATES AT APPROXIMATE LOCATIONS SHOWN. FOOTINGS FOR POSTS SHALL NOT EXTEND INTO THE BACKFILL FOR SAND DRAINS.
6. INSTALL COMPACTED COMPOST BERMS AT ELEVATIONS SHOWN.
7. THE WELLS AND PROBES SHOWN WILL BE INSTALLED BY THE ENGINEER, AFTER COMPLETION OF REMEDIATION.
8. INSTALL 4" DIAMETER HDPE SLEEVES WHERE SHOWN FOR IRRIGATION.
9. COMPACT THE COMMON BORROW LAYER ALONG THE ACCESS ROAD BY A CASE SV207E SINGLE DRUM VIBRATORY COMPACTOR, OR EQUAL, BY AT LEAST 3 PASSES OR AS DIRECTED BY THE ENGINEER.

0 75 150
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
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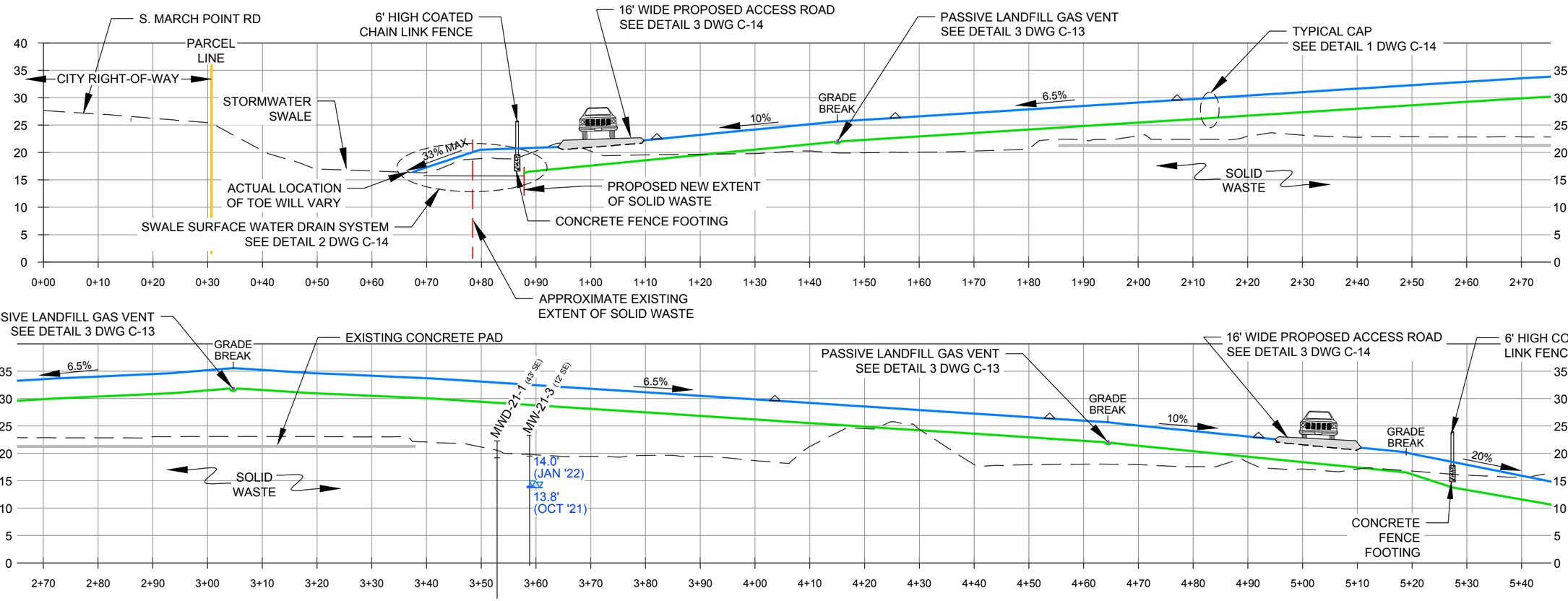
NOORUS TAHGITCHEH STATE OF WASHINGTON 32240 REGISTERED PROFESSIONAL ENGINEER

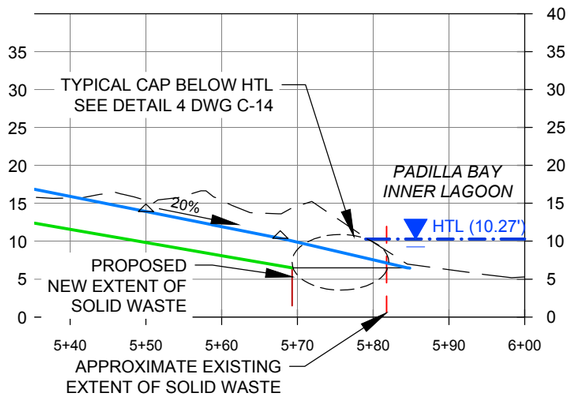
FINAL SITE PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-8

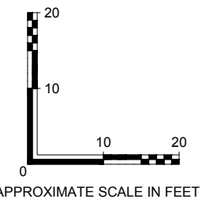
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Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg





A CROSS SECTION A

Scale: AS SHOWN



APPROXIMATE SCALE IN FEET

CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 13.69' (OCT '21) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

1. THE ACTUAL EXTENT OF WASTE ALONG THE SOUTH/SOUTHWEST SWALE IS UNKNOWN; IT DOES NOT EXTEND TO THE SWALE CENTERLINE. EARTHWORK ALONG THE SWALE IS INTENDED TO MINIMIZE THE WASTE FOOTPRINT, ELIMINATE OR MINIMIZE THE TREES TO BE REMOVED, AND ALLOW FOR LANDFILL CAP BACKFILL FOR SAND DRAINS AND SELECT BORROW LAYERS TO DRAIN TO THE SWALE. ADJUST CONSTRUCTION TO ACHIEVE THE OBJECTIVE.
2. INSTALL DRAIN ROCK CHANNELS EVERY 50'. WHERE THE SWALE BANK DOES NOT NEED TO BE REPLACED, AS DIRECTED BY THE ENGINEER. SEE DETAIL 2 ON DRAWING C-14.
3. MUDFLATS ELEVATION OF 5' HAS BEEN USED FOR THE PURPOSE OF THE DESIGN; ACTUAL ELEVATION WILL VARY. ADJUST THE SLOPE ALONG THE SHORELINE WITH CHANGES IN THE ELEVATION OF MUDFLATS; SLOPES SHOWN ARE MAXIMUM, EXCEPT NEAR THE TOP WHERE 5 PERCENT SLOPE IS MINIMUM.
4. FINAL ACCESS ROAD SHALL BE AT LEAST 12' WIDE AT THE BASE AND 16' WIDE ON THE SURFACE. SEPARATE THE SELECT BORROW FROM THE SOIL WITH A LAYER OF CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL.
5. GROUNDWATER INFORMATION SHOWN IS APPROXIMATE, ACTUAL ELEVATIONS AT THE TIME OF WORK MAY VARY.

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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CORNELIUS TAUGHINBAUGH — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

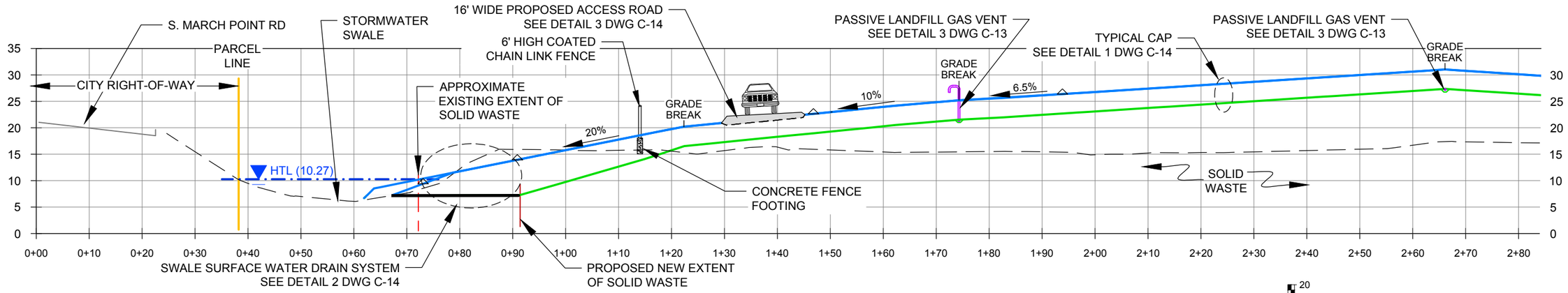
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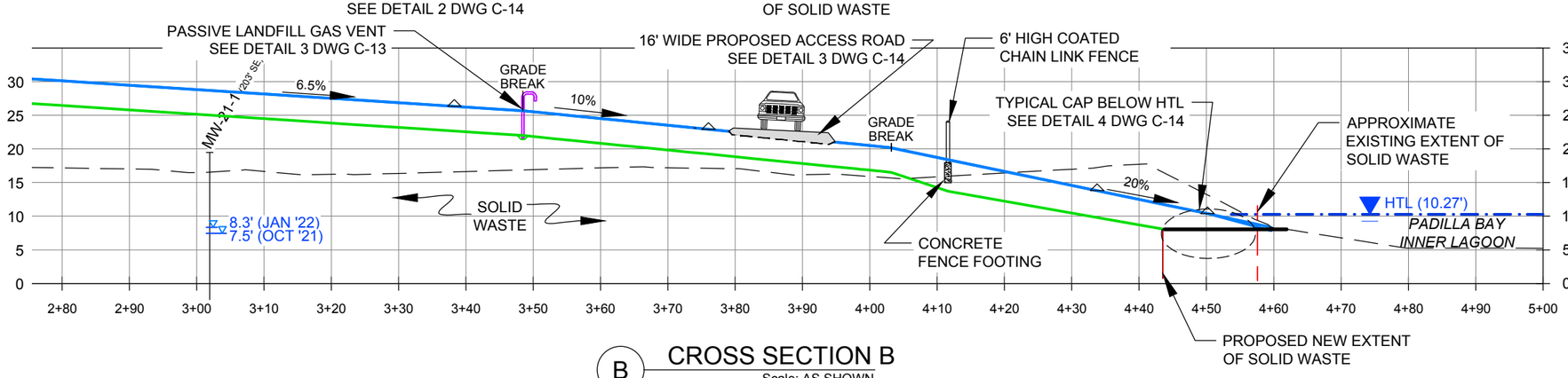
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING C-9

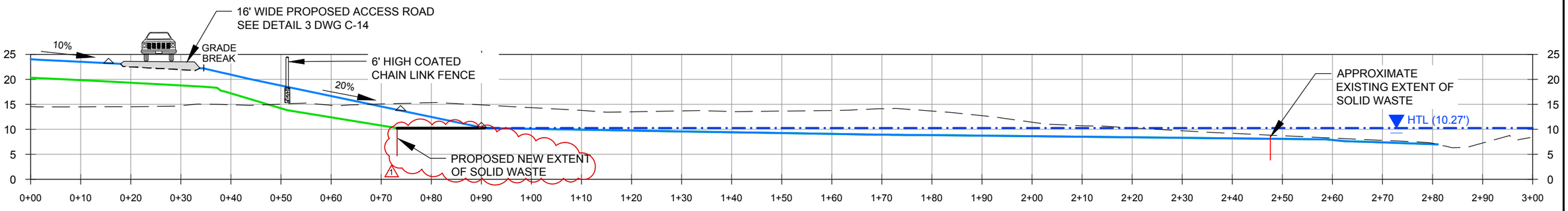
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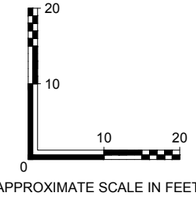
B CROSS SECTION B

Scale: AS SHOWN



X CROSS SECTION SE CORNER

Scale: AS SHOWN



CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 7.46' (OCT '21) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

SEE NOTES ON DRAWING C-9.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1	CORRECTED PROPOSED EXTENT OF SOLID WASTE	05/19/25	KT

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

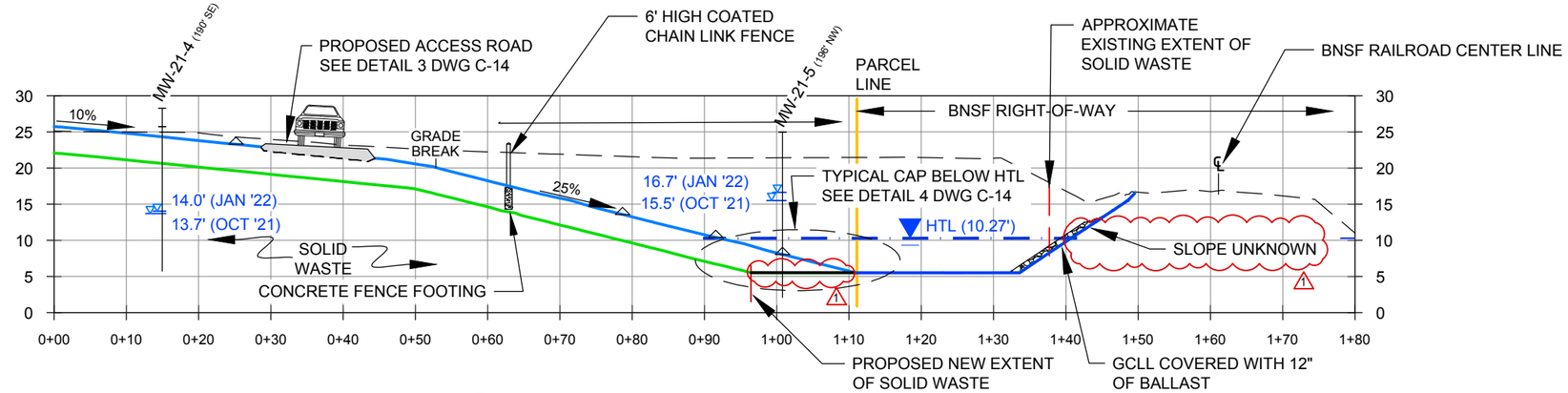
WSP USA Inc.
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Redmond, Washington 98052

CROSS SECTIONS B and X

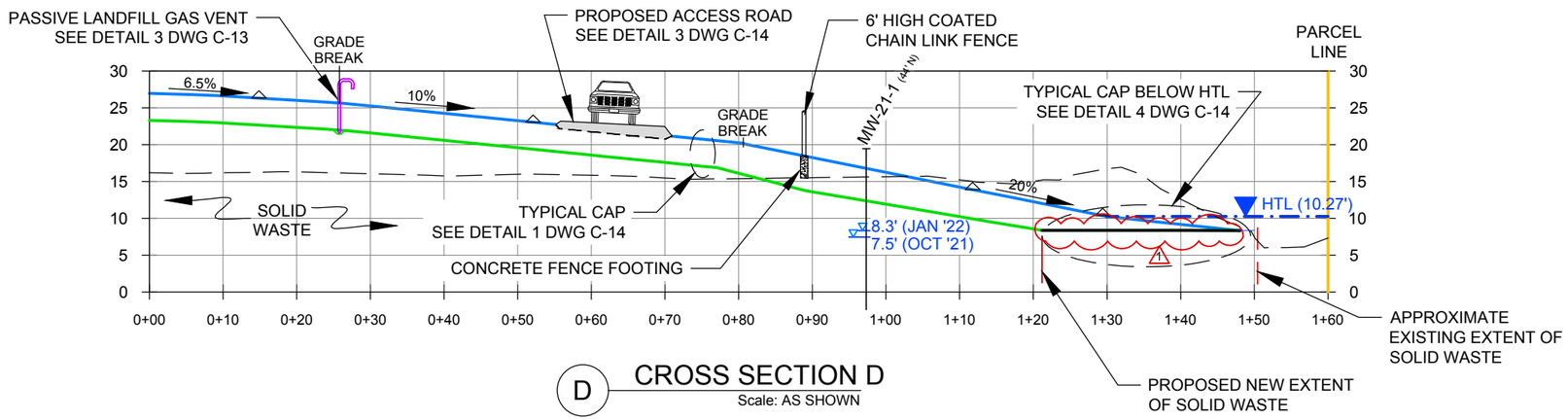
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-10

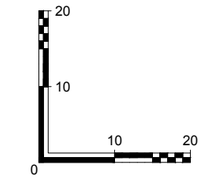
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Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-DwgToAcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



C CROSS SECTION C
Scale: AS SHOWN



D CROSS SECTION D
Scale: AS SHOWN



APPROXIMATE SCALE IN FEET

CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 14.0' (JAN '22) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

SEE NOTES ON DRAWING C-9.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1	CLARIFICATIONS ADDED	05/19/25	KT

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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Redmond, Washington 98052

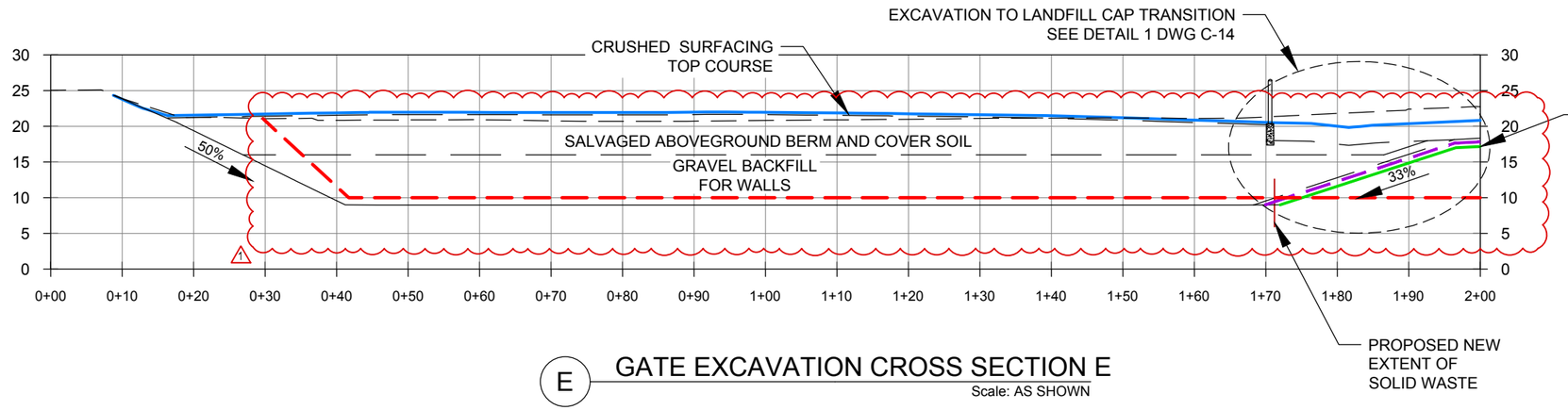
CROSS SECTIONS C and D

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

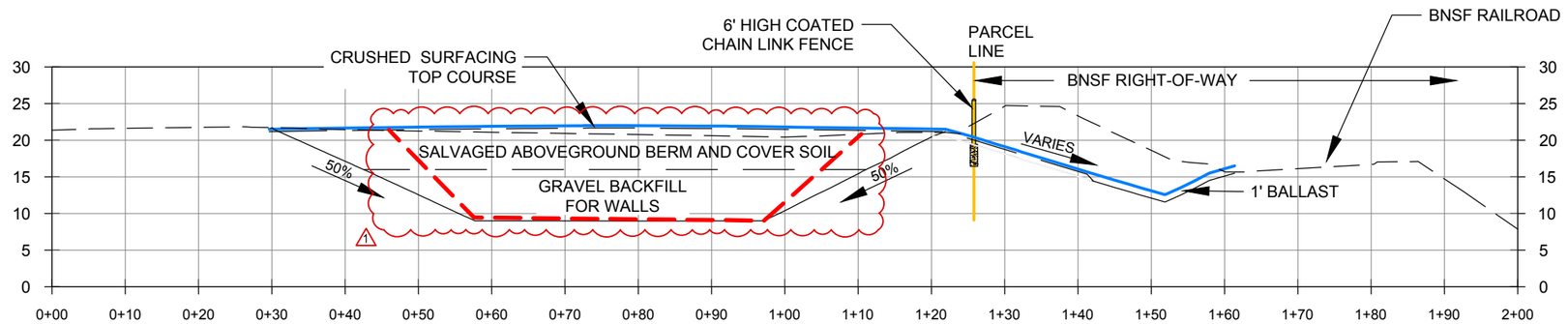
DRAWING
C-11

Plot Date: 11/06/25 - 8:38am Plotted by: USAS719374
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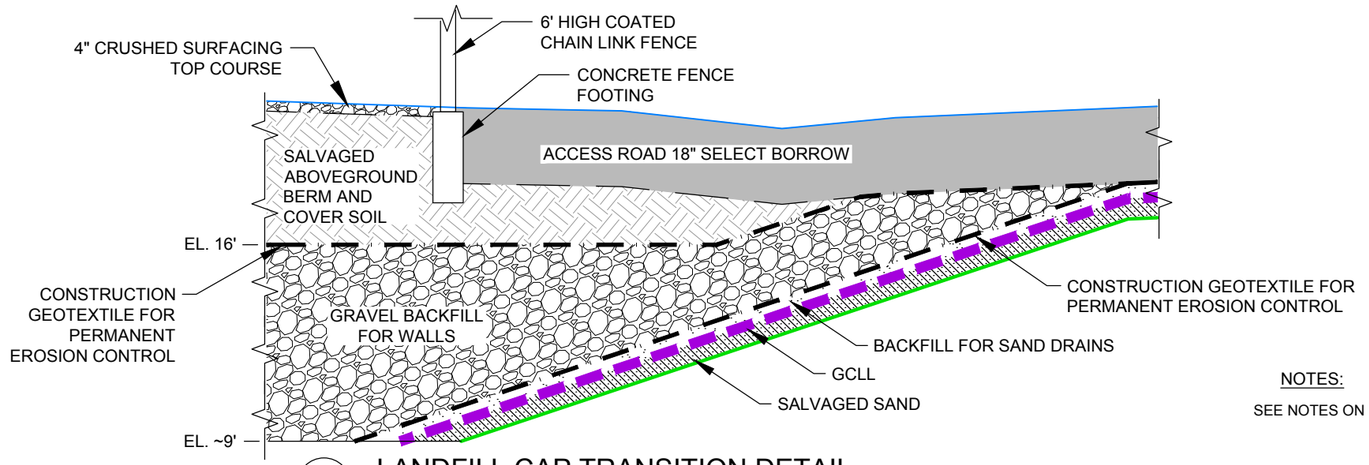
E GATE EXCAVATION CROSS SECTION E

Scale: AS SHOWN



F GATE EXCAVATION CROSS SECTION F

Scale: AS SHOWN

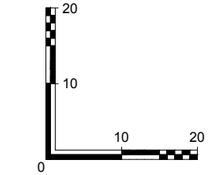


1 LANDFILL CAP TRANSITION DETAIL

NOT TO SCALE

CROSS SECTION EXPLANATION

- EXISTING GRADE
- BOTTOM OF EXCAVATION
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- APPROXIMATE EXISTING EXTENT OF SOLID WASTE ACTUAL EXTENT VARIES (1)



APPROXIMATE SCALE IN FEET

NOTES:

SEE NOTES ON DRAWING C-9.

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1	APPROXIMATE EXTENT OF SOLID WASTE ADDED	05/19/25	KT

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

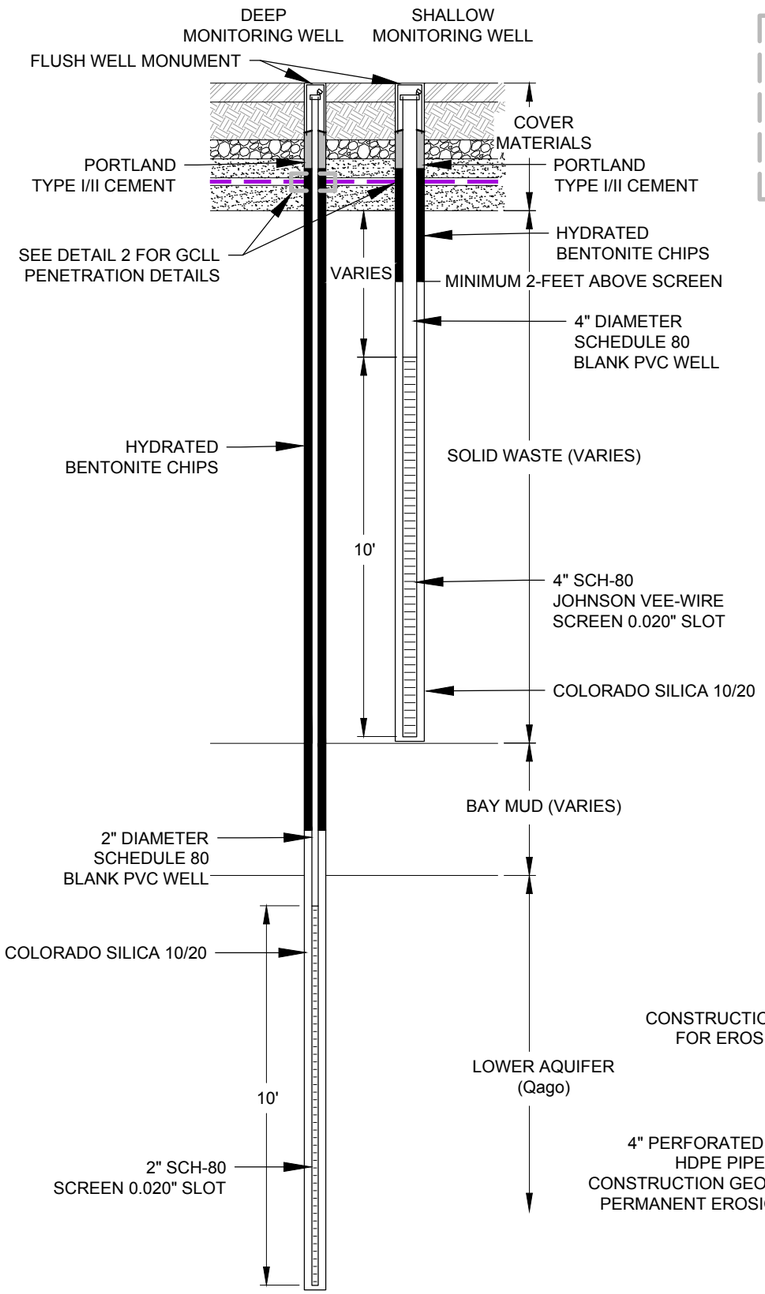
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Redmond, Washington 98052

CROSS SECTIONS E and F

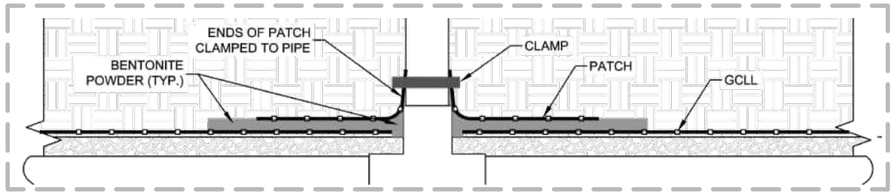
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-12

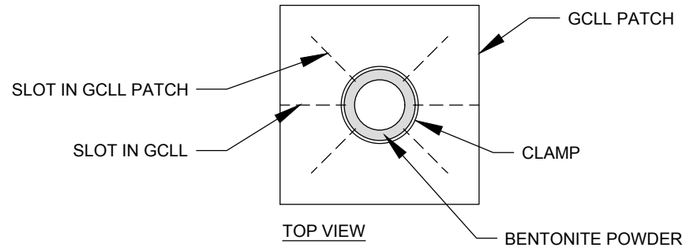
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Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



1 GROUNDWATER MONITORING WELL PAIR
(BY THE ENGINEER) NOT TO SCALE

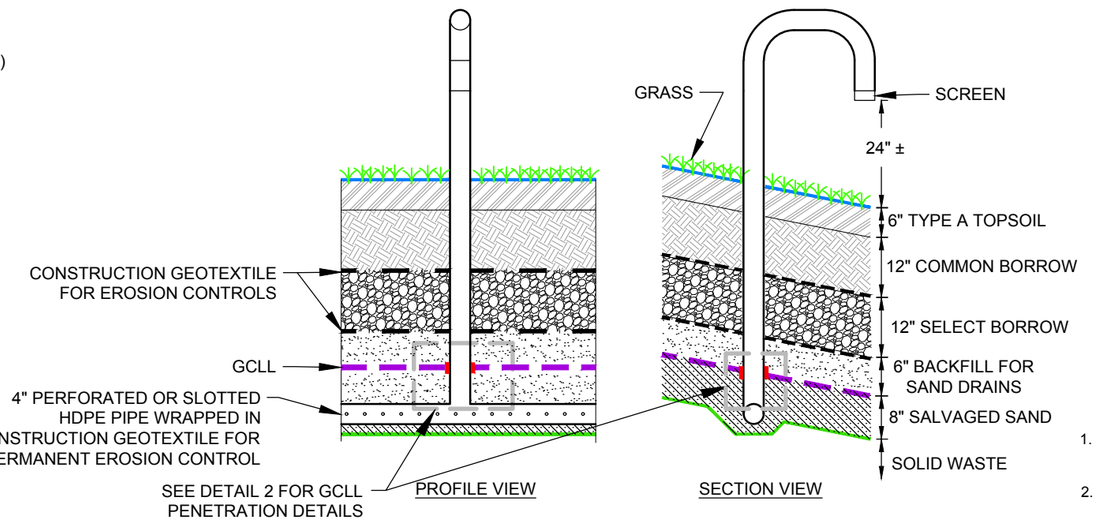


PATCH PROFILE VIEW

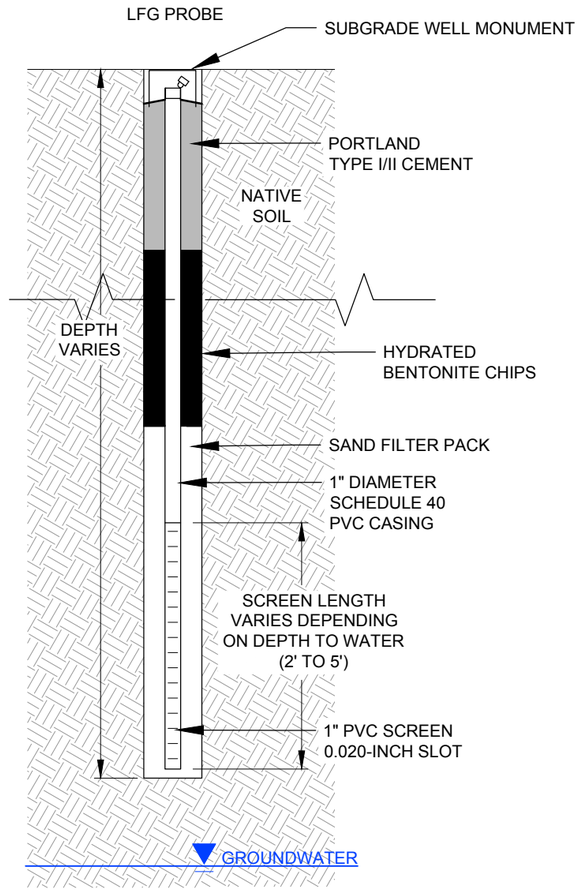


TOP VIEW

2 GCLL PENETRATION DETAIL
NOT TO SCALE



3 PASSIVE LANDFILL GAS VENT DETAIL
(BY THE CONTRACTOR) NOT TO SCALE



4 LFG PROBE DETAIL
(BY THE ENGINEER) NOT TO SCALE

NOTES:

1. THE ENGINEER WILL INSTALL MONITORING WELLS AND GAS PROBES IN ACCORDANCE WITH STATE OF WASHINGTON WELL REGULATIONS.
2. WELL INSTALLATION WILL OCCUR AFTER COMPLETION OF THE PROJECT.
3. WORK INVOLVES EXCAVATING THE CAP TO THE GEOSYNTHETIC CLAY LAYER. THE SEAL RESTORATION SHALL BE IN ACCORDANCE WITH DETAIL 2, DRAWING C-13.

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
		05/19/25	

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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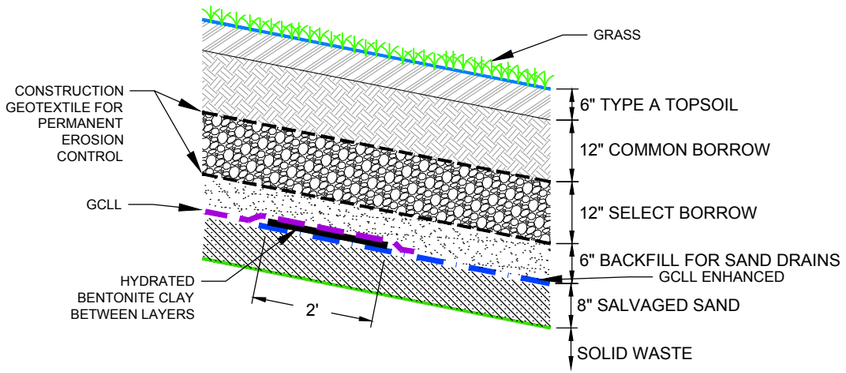
KODIAK TAHGETGAY STATE OF WASHINGTON #22240 REGISTERED PROFESSIONAL ENGINEER

DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

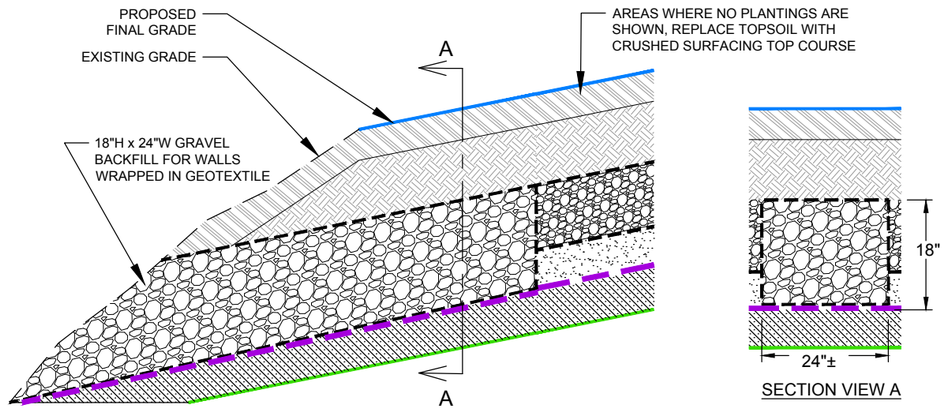
DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-13

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



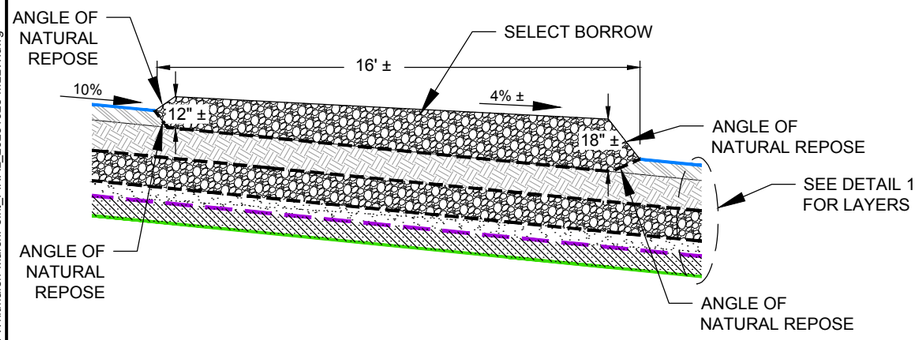
1 CAP AND GCLL OVERLAP DETAIL (EL. 16')

NOT TO SCALE



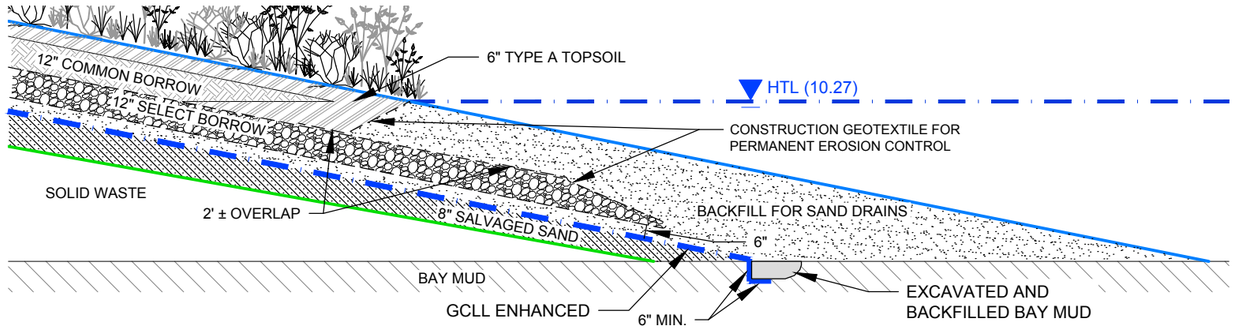
2 18"H X 24"W DRAIN ROCK DETAIL INTO SWALE

NOT TO SCALE



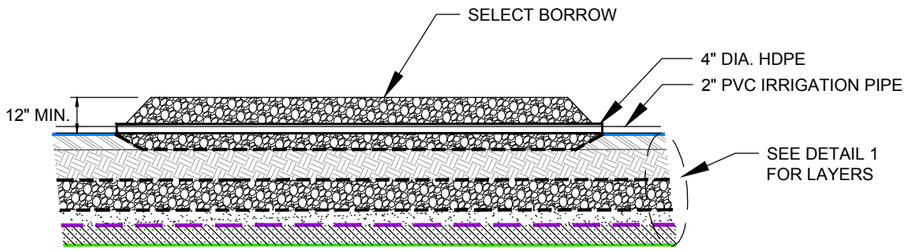
3 ACCESS ROAD DETAIL

NOT TO SCALE



4 CAP DETAIL BELOW HTL

NOT TO SCALE



5 IRRIGATION CROSSING AT ACCESS ROADS DETAIL

NOT TO SCALE

KEY

- TYPE A TOP SOIL
- COMMON BORROW
- SELECT BORROW
- SAND
- SALVAGED SAND
- CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL
- GCLL
- ENHANCED GCLL

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
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Redmond, Washington 98052

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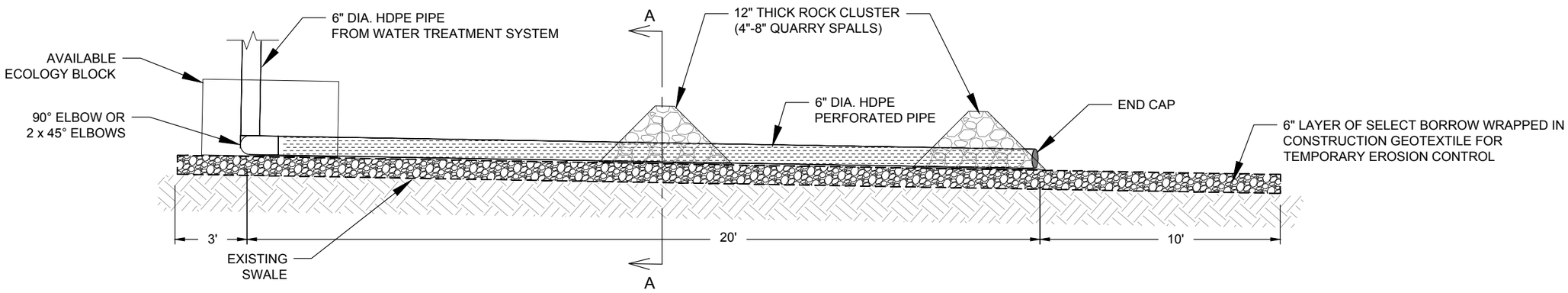
DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

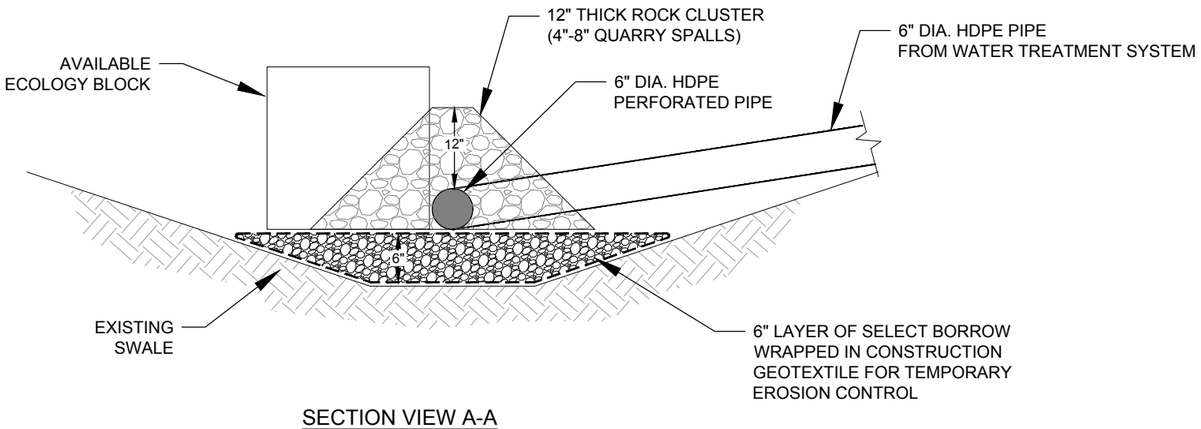
DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING C-14

Plot Date: 11/06/25 - 8:38am Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-DwgToAcPublish_28616\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



1 TEMPORARY OUTFALL PROFILE
NOT TO SCALE



SECTION VIEW A-A
NOT TO SCALE

EXPLANATION

- 4"-8" QUARRY SPALLS
- SELECT BORROW
- CONSTRUCTION GEOTEXTILE FOR TEMPORARY EROSION CONTROL

NOTES:

1. DISCHARGE THE TREATED WATER TO THE SOUTH STORMWATER SWALE. ENGINEER WILL IDENTIFY THE ACTUAL LOCATION.
2. INSTALL A DIFFUSER TO REDUCE THE ENERGY OF THE DISCHARGE. THE DIFFUSER SHALL BE 6 INCH DIAMETER HDPE PIPE WITH 24, 1/5" PERFORATIONS AT 4" O.C. ALONG THE 20' LENGTH OF THE DIFFUSER PIPE.
3. CONSTRUCT THE DIFFUSER BEDDING BY WRAPPING SELECT BORROW IN CONSTRUCTION GEOTEXTILE FOR TEMPORARY EROSION CONTROL, AS SHOWN.
4. PLACE AN EXISTING ECOLOGY BLOCK AT THE ELBOW TO ABSORB THE ENERGY AND PLACE CONSTRUCTION ENTRANCE ROCK (4"-8" QUARRY SPALLS) AT MID-POINT AND THE AT THE END OF THE DIFFUSER, AS SHOWN.
5. UPON COMPLETION OF DISCHARGE, REMOVE ALL FEATURES AND RESTORE THE SWALE.

FINAL 06/06/25

NO.	REVISION	DATE	APRVD
1	NEW DRAWING	05/19/25	KT

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

DRAWN APS
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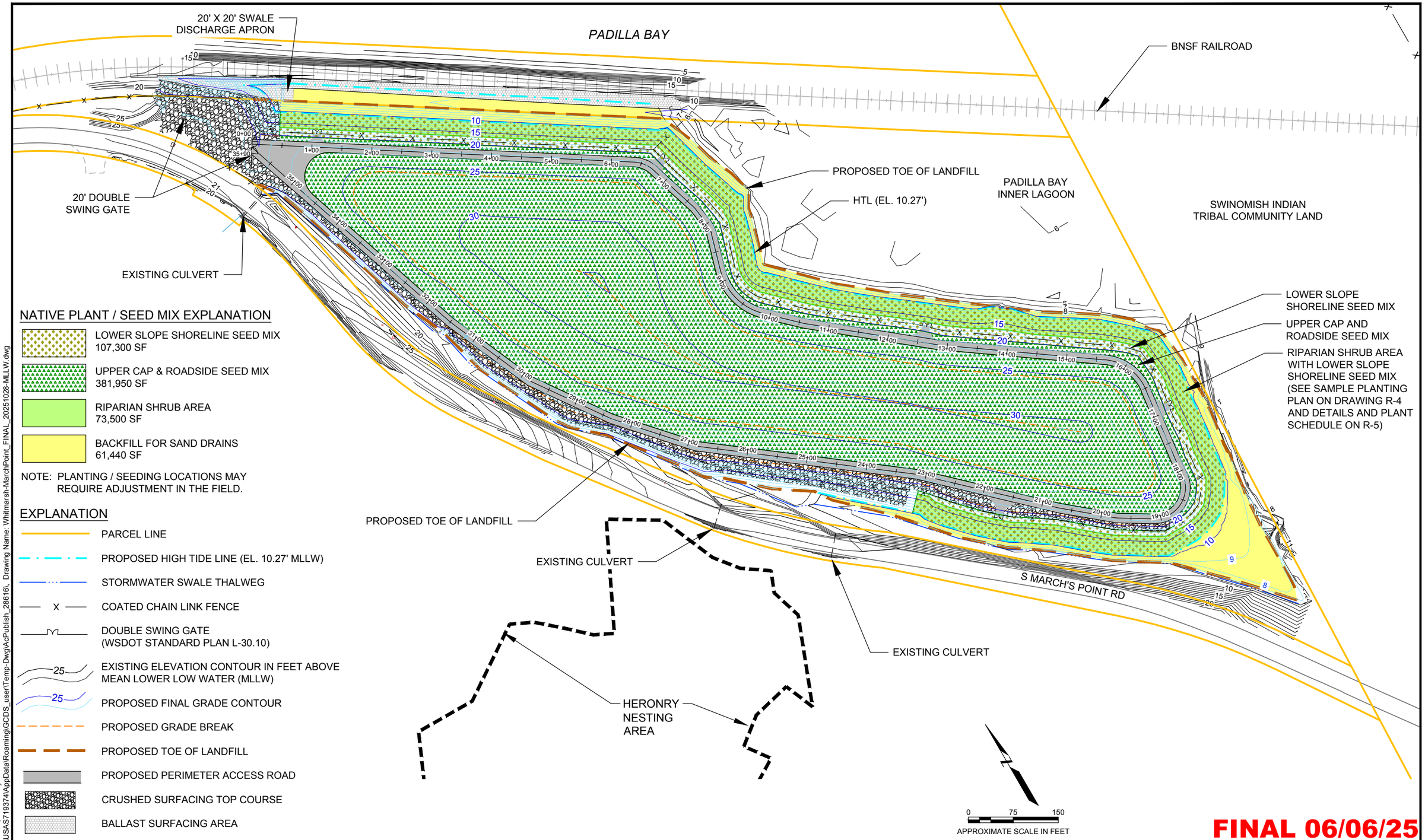
KOORUS TAGHI GHEI
STATE OF WASHINGTON
32240
REGISTERED
PROFESSIONAL ENGINEER

TEMPORARY OUTFALL DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING C-15

Plot Date: 11/06/25 - 8:38am. Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



NATIVE PLANT / SEED MIX EXPLANATION

- LOWER SLOPE SHORELINE SEED MIX
  107,300 SF
- UPPER CAP & ROADSIDE SEED MIX
  381,950 SF
- RIPARIAN SHRUB AREA
  73,500 SF
- BACKFILL FOR SAND DRAINS
  61,440 SF

NOTE: PLANTING / SEEDING LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- X — COATED CHAIN LINK FENCE
- DOUBLE SWING GATE
  (WSDOT STANDARD PLAN L-30.10)
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1			

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DESIGNED KT
CHECKED KT
REVIEWED KT

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KOOREUS TAHGITTAH
STATE OF WASHINGTON
32240
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SITE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING
R-1

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
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20' X 20' SWALE
DISCHARGE APRON

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

BNSF RAILROAD

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

PROPOSED TOE OF LANDFILL

HTL (EL. 10.27')

SWINOMISH INDIAN
TRIBAL COMMUNITY LAND

SEE SAMPLE PLANTING PLAN
SHOWN AT THIS AREA ON DRAWING R-4

PADILLA BAY
INNER LAGOON

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

LOWER SLOPE
SHORELINE SEED MIX

UPPER CAP AND
ROADSIDE SEED MIX

RIPARIAN SHRUB AREA
WITH LOWER SLOPE
SHORELINE SEED MIX
(SEE SAMPLE PLANTING
PLAN ON DRAWING R-4
AND DETAILS AND PLANT
SCHEDULE ON R-5)

0.3%
25%
10%
EL. 25.6-19.6
6.5%
EL. 35.3-25.6
20%
EL. 30-25.6

S MARCH'S POINT RD

SEE DRAWING R-3

EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- COATED CHAIN LINK FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TOE OF LANDFILL
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- BACKFILL FOR SAND DRAINS
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA

0 50 100
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM:
WASP NAD83 NORTH USFT.
VERTICAL DATUM:
MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

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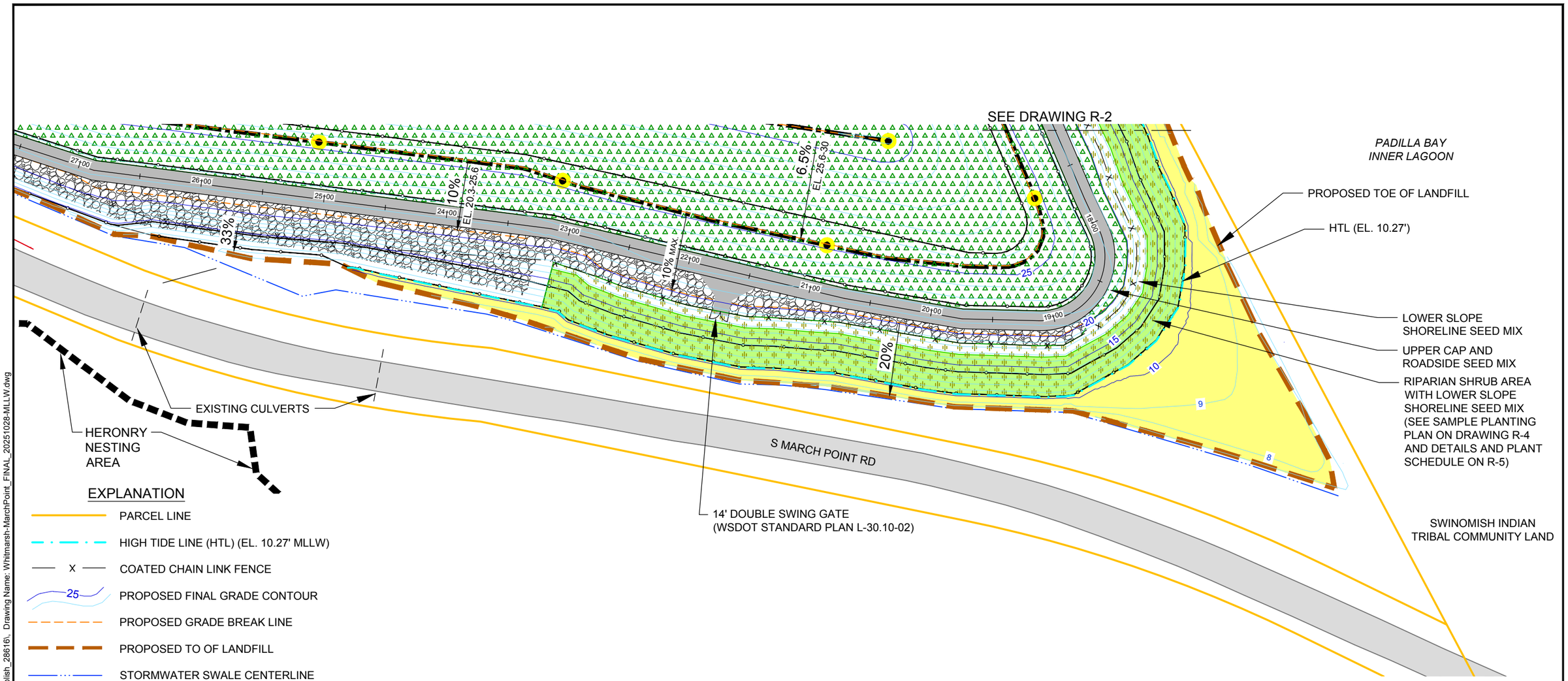
KORUS TAIGHLIGHT
STATE OF WASHINGTON
32240
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PLANTING PLAN
ALONG PADILLA BAY INNER LAGOON

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING
R-2

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- COATED CHAIN LINK FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TO OF LANDFILL
- STORMWATER SWALE CENTERLINE
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- BACKFILL FOR SAND DRAINS
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM:
WASP NAD83 NORTH USFT.
VERTICAL DATUM:
MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
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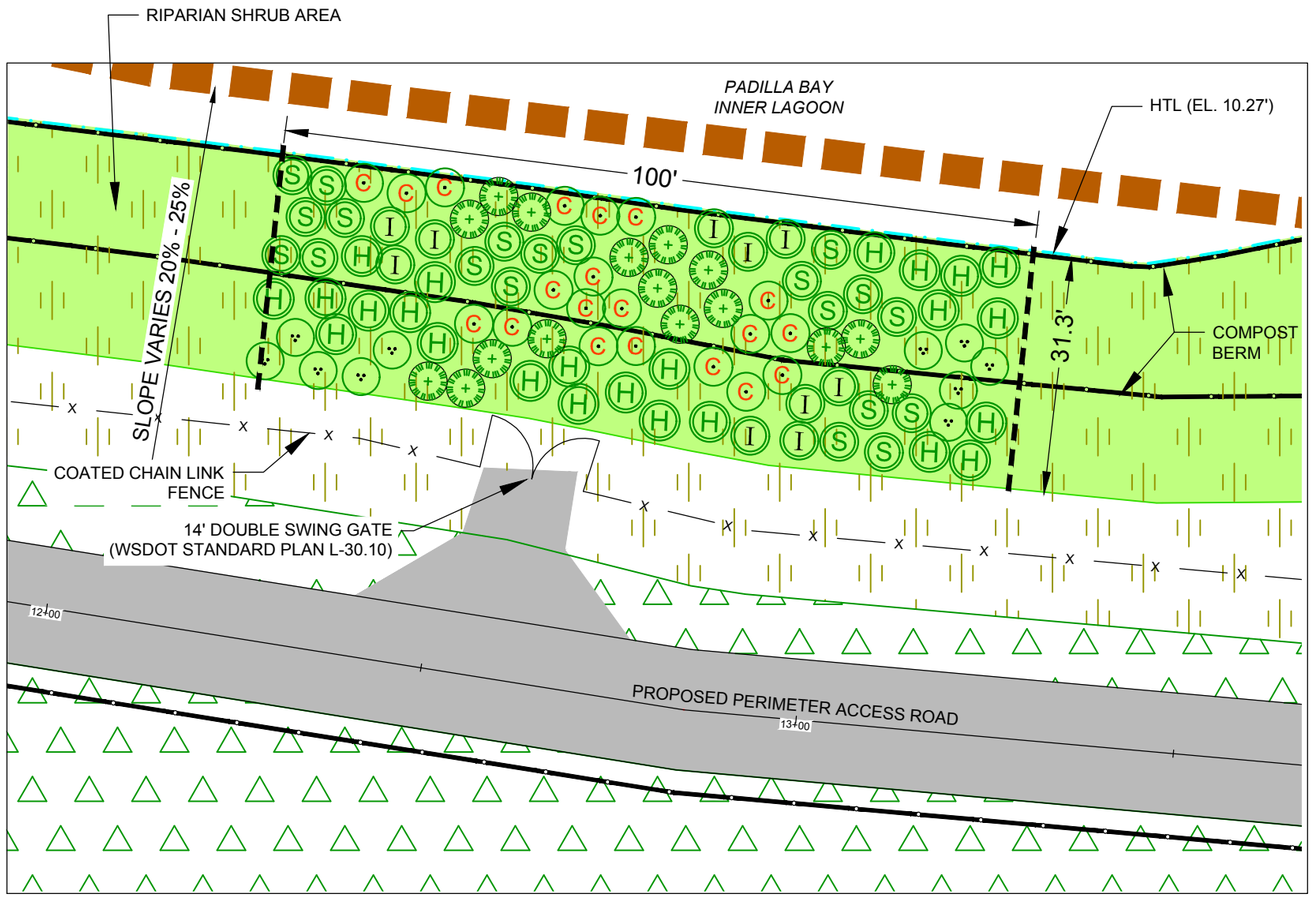
PLANTING PLAN
ALONG SOUTHERN DITCH

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING
R-3

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-DwgToPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



1 SHORELINE RESTORATION - RIPARIAN SHRUB AREA

3,130 SF SAMPLE PLANTING PLAN (100' X 31.3')

RIPARIAN SHRUB AREA PLANT SYMBOL EXPLANATION

	SHRUBS	QUANTITIES
⁘	*AMELANCHIER ALNIFOLIA* SERVICEBERRY	*10*
+	*GAULTHERIA SHALLON* SALAL	*16*
I	*HOLODISCUS DISCOLOR* OCEANSPRAY	*10*
C	*RIBES SANGUINEUM* RED FLOWERING CURRANT	*20*
S	*SYMPHORICARPOS ALBUS* SNOWBERRY	*20*
H	*VACCINIUM OVATUM* EVERGREEN HUCKLEBERRY	*24*

100 TOTAL
(FOR 3,130 SF AREA)

SEED MIXES

LOWER SLOPE SHORELINE SEED MIX

UPPER CAP AND ROADSIDE SEED MIX

NOTES:
1. SEE DETAILS AND PLANT SCHEDULE ON DRAWING R-5 FOR SPECIES, SIZE AND SPACING INFORMATION.
2. PLANTING DENSITY AND LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

0 10 20
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

KOORUS TAIGHI LEE
STATE OF WASHINGTON
32240
REGISTERED
PROFESSIONAL ENGINEER

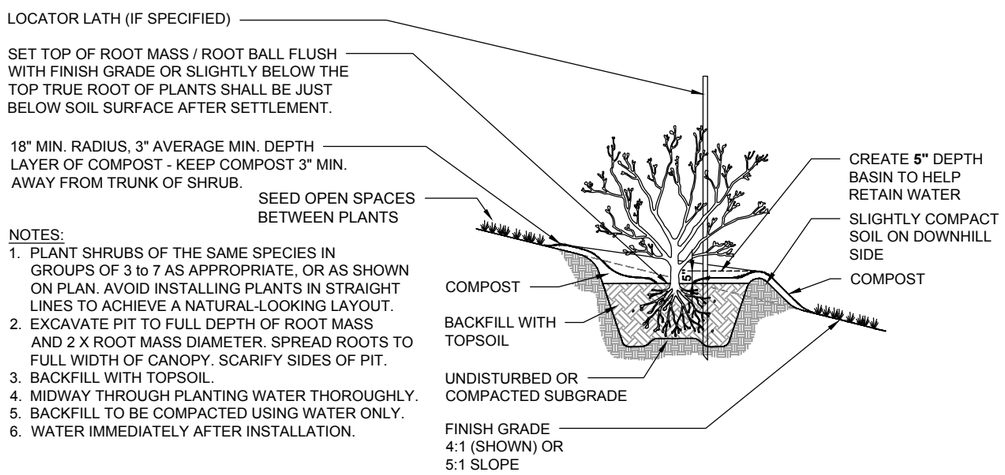
SAMPLE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

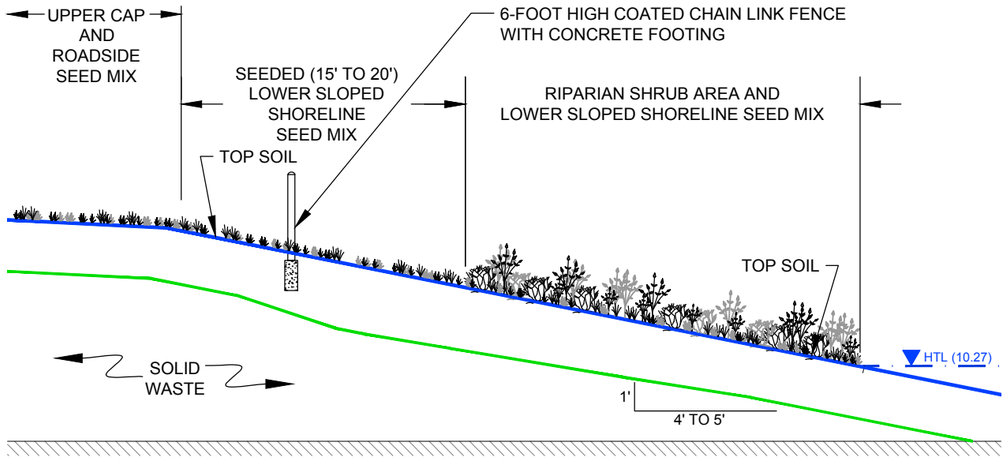
DRAWING
R-4

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Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\ Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



1 SHRUB PLANTING ON SLOPE

NOT TO SCALE



2 PLANTING DETAIL ALONG INNER LAGOON

NOT TO SCALE

CROSS SECTION EXPLANATION

PROPOSED FINAL GRADE

PROPOSED TOP OF REFUSE

NATIVE PLANT SCHEDULE

Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS	Spacing	Size	Condition	Planting Area
Shrubs - Lower Slope Shoreline			SF Area:	51,874	21,626	73,500				
			Acres	1.19	0.50	1.69				
Amelanchier alnifolia	Serviceberry		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry to Moist
Gaultheria shallon	Salal		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry - Upland
Holodiscus discolor	Oceanspray		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry - Upland
Ribes sanguineum	Red-flowering currant		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Moist to Wet
Symphoricarpos albus	Snowberry		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry to Moist
Vaccinium ovatum	Evergreen huckleberry		FACU	416	175	591	6 ft o.c	1 gal.	Container	Dry to Moist
Total			**Quan:**	**1,665**	**695**	**2360**				

Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS
Seed Mix - Lower Slope Shoreline (applied at 10 lbs. per acre)			SF Area:	78,520	28,780	107,300
		%	Acres	1.80	0.66	2.46
Agrostis stolonifera	Creeping bentgrass	15%	FAC	2.7	1.0	3.7
Aster subspicatus	Douglas aster	5%	NR	0.9	0.3	1.2
Atriplex patula	Saltweed	10%	FACW	1.8	0.7	2.5
Elymus mollis	Dunegrass	15%	NR	2.7	1.0	3.7
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.9	0.3	1.2
Grindelia integrifolia	Pacific gumweed	10%	FACW	1.8	0.7	2.5
Hordeum brachyantherum	Meadow barley	30%	FACW	5.4	2.0	7.4
Lathyrus japonicus	Beach pea	10%	FACU	1.8	0.7	2.5
Total		*100%*	**Pounds:**	**18.0**	**6.6**	**24.6**

Plant Name *Scientific*	Common		USDA Plant Wetland Status	AREA BETWEEN ROAD AND SLOPED PERIMETER	AREA WITHIN ROADWAY	TOTALS
Seed Mix - Upper Cap and Roadside (applied at 18 lbs. per acre)			SF Area:	15,192	366,758	381,950
		%	Acres	0.35	8.42	8.77
Deschampsia cespitosa	Tufted hairgrass	20%	FACW	1.3	30.3	31.6
Elymus glaucus	Blue wildrye	20%	FACU	1.3	30.3	31.6
Festuca rubra	Creeping red fescue	10%	FAC	0.6	15.2	15.8
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.3	7.6	7.9
Hordeum brachyantherum	Meadow barley	40%	FACW	2.5	60.6	63.1
Lupinus littoralis / rivulairs	Coastal lupine	5%	FAC	0.3	7.6	7.9
Total		*100%*	**Pounds:**	**6.3**	**151.6**	**157.8**

Notes:

1 - Scientific names and species identification taken from *Flora of the Pacific Northwest, 2nd Edition (Hitchcock and Cronquist, Ed. by Giblin, Ledger, Zika, and Olmstead, 2018).*

2 - Over-sized and/or container plants are suitable for replacement pending project engineer's or landscape architect's approval.

3 - Native plant species may be substituted or added with project engineer's or landscape architect's approval. Preference for substitutions is to select plant that shares the same USDA Plant Wetland Status Rating (see column 3 - USDA Plant Wetland Status).

4 - Planting density and locations may require adjustment in the field.

DEFINITION OF ACRONYMS:

USDA – United States Department of Agriculture

FACW (Facultative Wetland Plants)—Usually occur in wetlands, but may occur in non-wetlands.

FAC (Facultative Plants)—Occur in wetlands and non-wetlands.

FACU (Facultative Upland Plants)—Usually occur in non-wetlands, but may occur in wetlands.

3 NATIVE PLANT SCHEDULE

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

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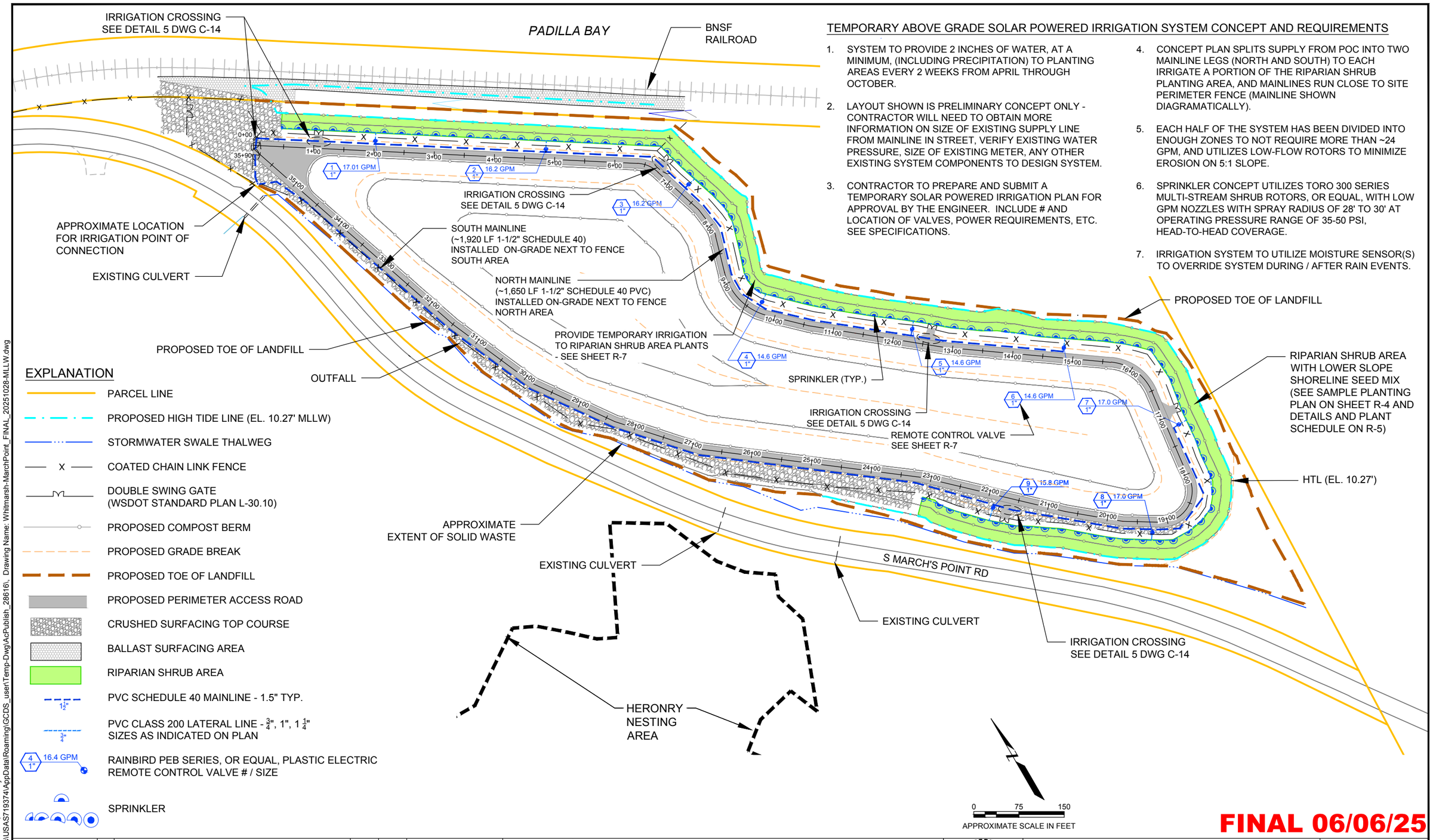
KODRUS TAHGHIGHI STATE OF WASHINGTON 26248 REGISTERED PROFESSIONAL ENGINEER

PLANTING DETAILS AND NATIVE PLANT SCHEDULE

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING R-5

Plot Date: 11/06/25 - 8:38am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_28616\, Drawing Name: Whitmarsh-MarchPoint_FINAL_20251028-MLLW.dwg



TEMPORARY ABOVE GRADE SOLAR POWERED IRRIGATION SYSTEM CONCEPT AND REQUIREMENTS

1. SYSTEM TO PROVIDE 2 INCHES OF WATER, AT A MINIMUM, (INCLUDING PRECIPITATION) TO PLANTING AREAS EVERY 2 WEEKS FROM APRIL THROUGH OCTOBER.
2. LAYOUT SHOWN IS PRELIMINARY CONCEPT ONLY - CONTRACTOR WILL NEED TO OBTAIN MORE INFORMATION ON SIZE OF EXISTING SUPPLY LINE FROM MAINLINE IN STREET, VERIFY EXISTING WATER PRESSURE, SIZE OF EXISTING METER, ANY OTHER EXISTING SYSTEM COMPONENTS TO DESIGN SYSTEM.
3. CONTRACTOR TO PREPARE AND SUBMIT A TEMPORARY SOLAR POWERED IRRIGATION PLAN FOR APPROVAL BY THE ENGINEER. INCLUDE # AND LOCATION OF VALVES, POWER REQUIREMENTS, ETC. SEE SPECIFICATIONS.
4. CONCEPT PLAN SPLITS SUPPLY FROM POC INTO TWO MAINLINE LEGS (NORTH AND SOUTH) TO EACH IRRIGATE A PORTION OF THE RIPARIAN SHRUB PLANTING AREA, AND MAINLINES RUN CLOSE TO SITE PERIMETER FENCE (MAINLINE SHOWN DIAGRAMATICALLY).
5. EACH HALF OF THE SYSTEM HAS BEEN DIVIDED INTO ENOUGH ZONES TO NOT REQUIRE MORE THAN ~24 GPM, AND UTILIZES LOW-FLOW ROTORS TO MINIMIZE EROSION ON 5:1 SLOPE.
6. SPRINKLER CONCEPT UTILIZES TORO 300 SERIES MULTI-STREAM SHRUB ROTORS, OR EQUAL, WITH LOW GPM NOZZLES WITH SPRAY RADIUS OF 28' TO 30' AT OPERATING PRESSURE RANGE OF 35-50 PSI, HEAD-TO-HEAD COVERAGE.
7. IRRIGATION SYSTEM TO UTILIZE MOISTURE SENSOR(S) TO OVERRIDE SYSTEM DURING / AFTER RAIN EVENTS.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED COMPOST BERM
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- PVC CLASS 200 LATERAL LINE - $\frac{3}{4}$", 1", 1 $\frac{1}{4}$" SIZES AS INDICATED ON PLAN
- 4 / 1" 16.4 GPM — RAINBIRD PEB SERIES, OR EQUAL, PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- SPRINKLER

FINAL 06/06/25

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
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Redmond, Washington 98052

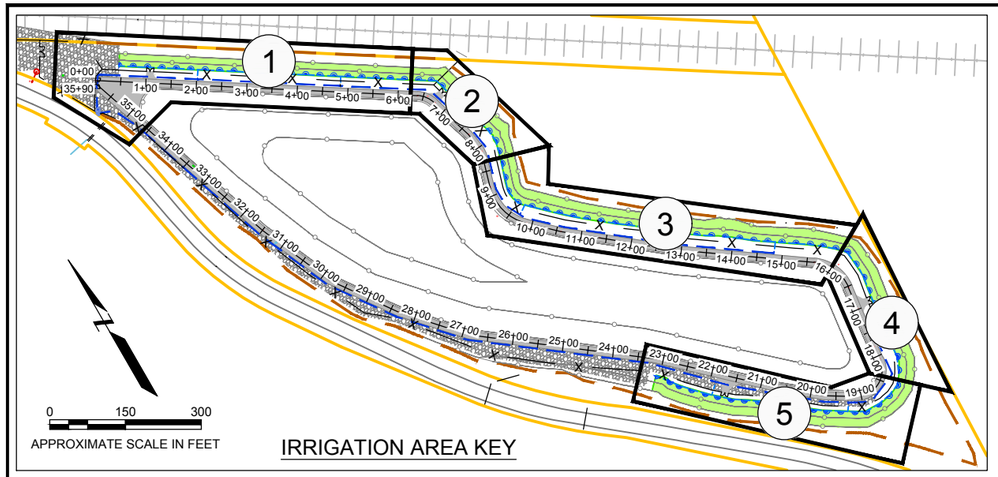
ACORUS TAHGHLIAN — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

TEMPORARY IRRIGATION CONCEPT PLAN

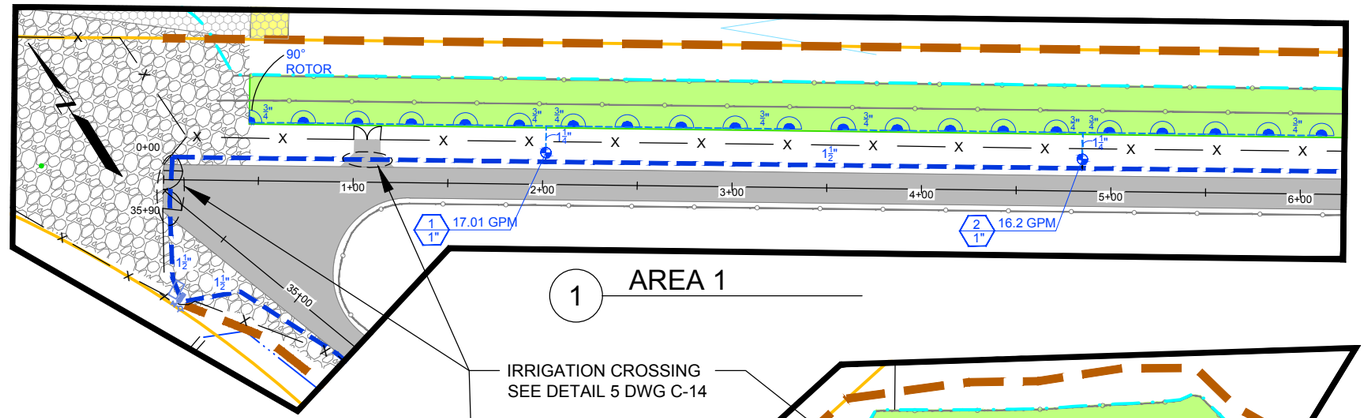
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410
DRAWING R-6

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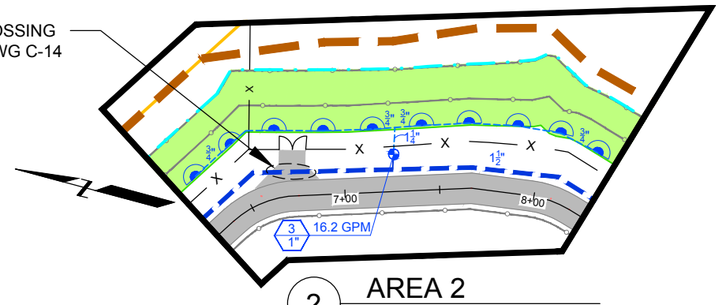


IRRIGATION AREA KEY

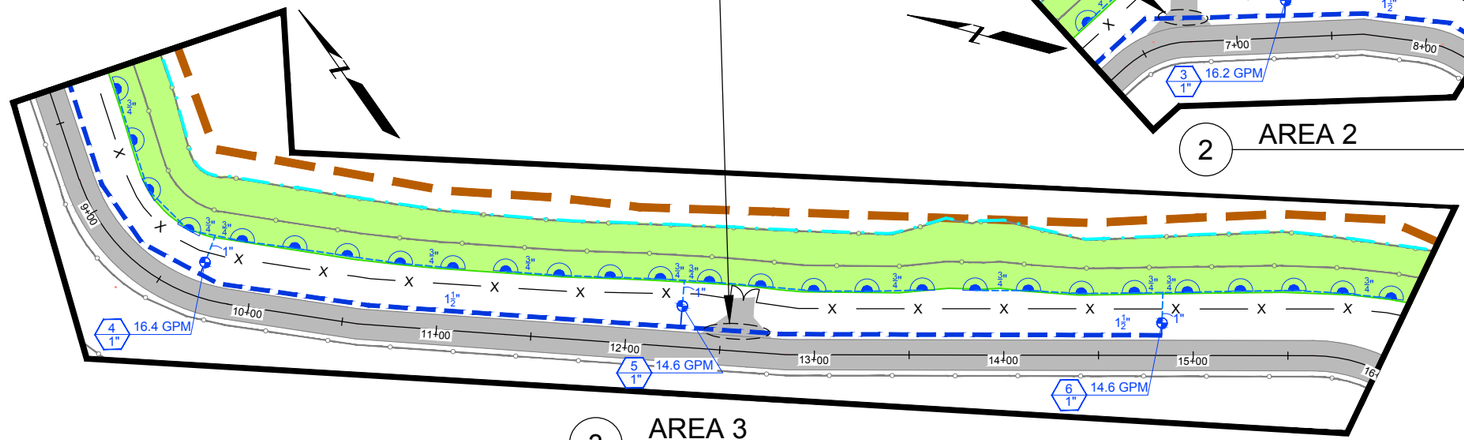


1 AREA 1

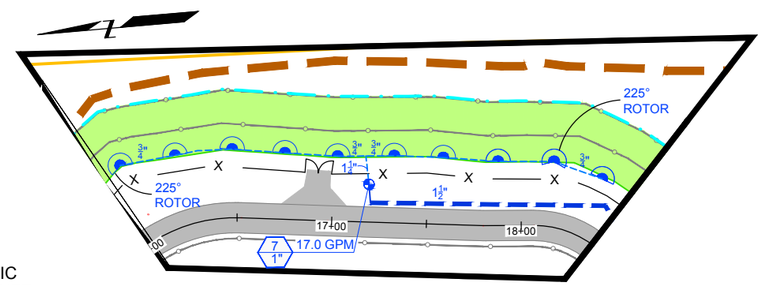
IRRIGATION CROSSING
SEE DETAIL 5 DWG C-14



2 AREA 2

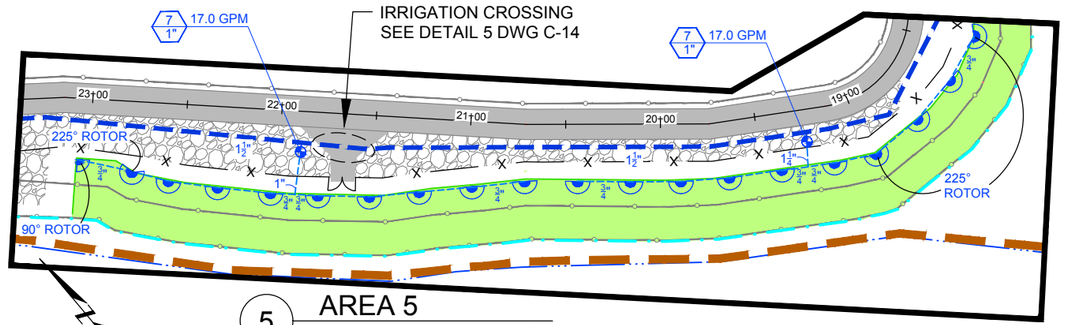


3 AREA 3



4 AREA 4

IRRIGATION CROSSING
SEE DETAIL 5 DWG C-14



5 AREA 5

0 40 80
APPROXIMATE SCALE IN FEET

FINAL 06/06/25

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED COMPOST BERM
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- 1½" PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- ¾", 1", 1¼" PVC CLASS 200 LATERAL LINE - SIZES AS INDICATED ON PLAN
- 4 1" 16.4 GPM RAINBIRD PEB SERIES, OR EQUAL, PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- SPRINKLER

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

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TEMPORARY IRRIGATION CONCEPT AREAS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 11/06/25
PROJECT NO.: PS21204410

DRAWING R-7

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CONTENTS

INTRODUCTION---------- 1

AMENDMENTS TO THE STANDARD SPECIFICATIONS

SPECIAL PROVISIONS

DIVISION 1
GENERAL REQUIREMENTS

DESCRIPTION OF WORK ---------- 1
Definition and Terms ---------- 2
Definitions ---------- 2
BID PROCEDURES AND CONDITIONS ---------- 4
BID PROCEDURES AND CONDITIONS ---------- 4
Supplemental Qualifications Criteria ---------- 4
Plans and Specifications ---------- 4
Examination of Plans, Specifications and Site of Work ---------- 5
General ---------- 5
Preparation of Proposal ---------- 5
Preparation of Proposal ---------- 5
Recycled Materials Proposal ---------- 6
Delivery of Proposal ---------- 6
Withdrawing, Revising, or Supplementing Proposal ---------- 7
Irregular Proposals ---------- 7
Disqualification of Bidders ---------- 8
Pre Award Information ---------- 12
AWARD AND EXECUTION OF CONTRACT ---------- 12
Consideration of Bids ---------- 12
Identical Bid Totals ---------- 13
Execution of Contract ---------- 13
Contract Bond ---------- 14
Judicial Review ---------- 14

PAGE

SCOPE OF THE WORK ---- 15
Coordination of Contract Documents, Plans, Special Provisions, ---- 15
Changes ---- 15
CONTROL OF WORK ---- 16
Working Drawings ---- 16
Conformity with and Deviations from Plans and Stakes ---- 17
Licensed Surveyors ---- 17
Removal of Defective and Unauthorized Work ---- 19
Final Inspection ---- 19
Record Drawings ---- 21
CONTROL OF MATERIAL ---- 23
Recycled Materials ---- 23
LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC ---- 23
Laws to be Observed ---- 23
State Sales Tax ---- 25
Environmental Regulations ---- 26
Environmental Commitments ---- 26
Payment ---- 26
Permits And Licenses ---- 29
Load Limits ---- 29
Wages ---- 29
General ---- 29
Required Documents ---- 30
Apprentices ---- 30
Requirements for Nondiscrimination ---- 30
Disadvantaged Business Enterprise Participation ---- 30
Utilities and Similar Facilities ---- 37
Prosecution and Progress ---- 42
Preliminary Matters ---- 42
Preconstruction Conference ---- 42
Hours of Work ---- 43
Subcontracting ---- 43
Progress Schedule ---- 43
Type A Progress Schedule ---- 43

PAGE

Prosecution of Work ---- 44
Notice to Proceed and Prosecution of Work ---- 44
Time For Completion ---- 44
Time for Completion ---- 44
Suspension of Work ---- 45
Liquidated Damages---- 46
MEASUREMENT AND PAYMENT---- 46
Measurement---- 46
Force Account---- 46
Payment For Material On Hand---- 47
Payments---- 47
Payments---- 49
Retainage ---- 49
Time Limitation and Jurisdiction ---- 49

DIVISION 2
EARTHWORK

Removal of Structures and Obstructions ---- 50
Construction Requirements---- 50
Construction Geosynthetic---- 51
Earthwork for Landfill---- 55

DIVISION 8
MISCELLANEOUS CONSTRUCTION

Erosion Control and Water Pollution Control ---- 62
Roadside Restoration ---- 65
Irrigation Systems---- 71
Chain Link Fence and Wire Fence---- 78
Coated Chain Link Fence ---- 79
Landfill Gas Collection System---- 80
Field Office Building ---- 82

DIVISION 9
MATERIALS

Borrow ---- 83
Construction Geosynthetics---- 83
Landfill Cap and Gas System Materials---- 83

APPENDECIES

Appendix A: WSDOT Standard Plans
Appendix B: Federal Davis Bacon & Washington State Prevailing Wage Rates
Appendix C: Construction Contract & Contract Bond – Informational Only
Appendix D: Proposal Forms – Informational Only
Appendix E: Permits & Agreements
Appendix F: Heron Management Plan
Appendix G: Health & Safety Plan
Appendix H: Inadvertent Discovery Plan
Appendix I: Apprentice Utilization Requirements for Public Works Contracts
Appendix J: Vicinity Maps & Plans

INTRODUCTION TO THE SPECIAL PROVISIONS

(December 10, 2020 APWA GSP)

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2025 edition, as issued by the Washington State Department of Transportation (WSDOT) and the American Public Works Association (APWA), Washington State Chapter (hereafter "Standard Specifications"). The Standard Specifications, as modified or supplemented by these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions (GSPs) from various sources, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

The project-specific Special Provisions are not labeled as such. The GSPs are labeled under the headers of each GSP, with the effective date of the GSP and its source. For example:

(March 8, 2013 APWA GSP)
(April 1, 2013 WSDOT GSP)
(May 1, 2013 SkagitR)

Also incorporated into the Contract Documents by reference are:

- *Manual on Uniform Traffic Control Devices for Streets and Highways*, currently adopted edition, with Washington State modifications, if any
- *Standard Plans for Road, Bridge and Municipal Construction*, WSDOT/APWA, current edition
- *Model Toxics Control Act, current edition*

Contractor shall obtain copies of these publications, at Contractor's own expense.

Division 1
General Requirements

DESCRIPTION OF WORK

(March 13, 1995)
This Contract provides for the improvement of *** and cleanup of the former Whitmarsh Landfill (Site) under a Consent Decree with the Washington State Department of Ecology (Ecology) (project). Located within the City of Anacortes Shoreline Management Zone, the project will include activities within the shoreline of Padilla Bay inner lagoon. Work will include but is not limited to installation erosion control measures; excavation of waste outside the landfill entrance and from within BNSF right-of-way; excavation and sloping the perimeter of the landfill; salvage of surface sand layer for reuse; placement of all excavated material on the landfill to create a mound; backfill of the excavation outside the entrance; installation and operation of a temporary dewatering system; installation of a passive landfill gas venting

system; construction of a multilayer landfill cap system with geosynthetic clay liner laminated (GCLL) and layers of imported earthen material; landscaping the slopes of the final with plants and hydroseeding; installation of an irrigation system; construction of a crushed rock access road; installation of perimeter security fencing; and hydroseeding the site*** and other work, all in accordance with the attached Contract Plans, these Contract Provisions, and the Standard Specifications.

1-01 Definition and Terms

1-01.3 Definitions

(January 19, 2022 APWA GSP)

Delete the heading Completion Dates and the three paragraphs that follow it, and replace them with the following:

Dates

Bid Opening Date
The date on which the Contracting Agency publicly opens and reads the Bids.

Award Date
The date of the formal decision of the Contracting Agency to accept the lowest responsible and responsive Bidder for the Work.

Contract Execution Date
The date the Contracting Agency officially binds the Agency to the Contract.

Notice to Proceed Date
The date stated in the Notice to Proceed on which the Contract time begins.

Substantial Completion Date
The day the Engineer determines the Contracting Agency has full and unrestricted use and benefit of the facilities, both from the operational and safety standpoint, any remaining traffic disruptions will be rare and brief, and only minor incidental work, replacement of temporary substitute facilities, plant establishment periods, or correction or repair remains for the Physical Completion of the total Contract.

Physical Completion Date
The day all of the Work is physically completed on the project. All documentation required by the Contract and required by law does not necessarily need to be furnished by the Contractor by this date.

Completion Date
The day all the Work specified in the Contract is completed and all the obligations of the Contractor under the contract are fulfilled by the Contractor. All documentation required by the Contract and required by law must be furnished by the Contractor before establishment of this date.

Final Acceptance Date
The date on which the Contracting Agency accepts the Work as complete.

Engineer
Contracting agency's representatives who directly supervise the engineering and administration of the construction contract.

Supplement this Section with the following:

All references in the Standard Specifications or WSDOT General Special Provisions, to the terms "Department of Transportation", "Washington State Transportation Commission", "Commission", "Secretary of Transportation", "Secretary", "Headquarters", and "State Treasurer" shall be revised to read "Contracting Agency".

All references to the terms "State" or "state" shall be revised to read "Contracting Agency" unless the reference is to an administrative agency of the State of Washington, a State statute or regulation, or the context reasonably indicates otherwise.

All references to "State Materials Laboratory" shall be revised to read "Contracting Agency designated location".

All references to "final contract voucher certification" shall be interpreted to mean the Contracting Agency form(s) by which final payment is authorized, and final completion and acceptance granted.

Additive
A supplemental unit of work or group of bid items, identified separately in the Bid Proposal, which may, at the discretion of the Contracting Agency, be awarded in addition to the base bid.

Alternate
One of two or more units of work or groups of bid items, identified separately in the Bid Proposal, from which the Contracting Agency may make a choice between different methods or material of construction for performing the same work.

Business Day
A business day is any day from Monday through Friday except holidays as listed in Section 1-08.5.

Contract Bond
The definition in the Standard Specifications for "Contract Bond" applies to whatever bond form(s) are required by the Contract Documents, which may be a combination of a Payment Bond and a Performance Bond.

Contract Documents
See definition for "Contract".

Contract Time
The period of time established by the terms and conditions of the Contract within which the Work must be physically completed.

Notice of Award
The written notice from the Contracting Agency to the successful Bidder signifying the Contracting Agency's acceptance of the Bid Proposal.

Notice to Proceed
The written notice from the Contracting Agency or Engineer to the Contractor authorizing and directing the Contractor to proceed with the Work and establishing the date on which the Contract time begins.

Traffic
Both vehicular and non-vehicular traffic, such as pedestrians, bicyclists, wheelchairs, and equestrian traffic.

1-02 Bid Procedures and Conditions

1-02 BID PROCEDURES AND CONDITIONS

1-02.1 Prequalification of Bidders

Delete this section and replace it with the following:

1-02.1 Qualifications of Bidder
(January 24, 2011 APWA GSP)

Before award of a public works contract, a bidder must meet at least the minimum qualifications of RCW 39.04.350(1) to be considered a responsible bidder and qualified to be awarded a public works project.

Add the following new section:

1-02.1(1) Supplemental Qualifications Criteria
(July 31, 2017 APWA GSP; requires pre-approval on FHWA funded projects, through WSDOT/Local Programs)

In addition, the Contracting Agency has established Contracting Agency-specific and/or project-specific supplemental criteria, in accordance with RCW 39.04.350(3), for determining Bidder responsibility, including the basis for evaluation and the deadline for appealing a determination that a Bidder is not responsible. These criteria are contained in Section 1-02.14 Option C of these Special Provisions.

1-02.2 Plans and Specifications
(June 27, 2011 APWA GSP)

Delete this section and replace it with the following:

Information as to where Bid Documents can be obtained or reviewed can be found in the Call for Bids (Advertisement for Bids) for the work.

After award of the contract, plans and specifications will be issued to the Contractor at no cost as detailed below:

To Prime Contractor	No. of Sets	Basis of Distribution
Reduced plans (11" x 17")	3	Furnished automatically upon award.

Contract Provisions	3	Furnished automatically upon award.
Large plans (e.g., 22" x 34")	1	Furnished only upon request.

Additional plans and Contract Provisions may be obtained by the Contractor from the source stated in the Call for Bids, at the Contractor's own expense.

1-02.4 Examination of Plans, Specifications and Site of Work

1-02.4(1) General

(December 30, 2022 APWA GSP Option B)

The first sentence of the ninth paragraph, beginning with "Prospective Bidder desiring…", is revised to read:

> Prospective Bidders desiring an explanation or interpretation of the Bid Documents, shall request the explanation or interpretation in writing by close of business 10 business days preceding the bid opening to allow a written reply to reach all prospective Bidders before the submission of their Bids.

Preparation of Proposal

1-02.6 Preparation of Proposal

(December 10, 2020 APWA GSP, Option B)

Supplement the second paragraph with the following:

4. If a minimum bid amount has been established for any item, the unit or lump sum price must equal or exceed the minimum amount stated.
5. Any correction to a bid made by interlineation, alteration, or erasure, shall be initialed by the signer of the bid.

Delete the last two paragraphs, and replace them with the following:

The Bidder shall submit with their Bid a completed Contractor Certification Wage Law Compliance form, provided by the Contracting Agency. Failure to return this certification as part of the Bid Proposal package will make this Bid Nonresponsive and ineligible for Award. A Contractor Certification of Wage Law Compliance form is included in the Proposal Forms.

The Bidder shall make no stipulation on the Bid Form, nor qualify the bid in any manner.

A bid by a corporation shall be executed in the corporate name, by the president or a vice president (or other corporate officer accompanied by evidence of authority to sign).

A bid by a partnership shall be executed in the partnership name, and signed by a partner. A copy of the partnership agreement shall be submitted with the Bid Form if any UDBE requirements are to be satisfied through such an agreement.

A bid by a joint venture shall be executed in the joint venture name and signed by a member of the joint venture. A copy of the joint venture agreement shall be submitted with the Bid Form if any UDBE requirements are to be satisfied through such an agreement.

Section 1-02.6 is supplemented with the following:

(*****)
Sources of imported earthen material must be approved by the WA State Department of Ecology (Ecology). The Engineer is working with Ecology on this subject. For the purposes of bidding, the base bid has identified one source under consideration and another source has been identified as a Contracting Agency Alternative. This approach applies to Backfill for Sand Drains, Topsoil, and Compost used on the project. The sources in the base bid are:

1. Backfill for Sand Drains	Granite Construction, Mt. Vernon, WA. Mike Bursey (425) 551-3148
2. Topsoil and Compost	Growsource, Bellingham, WA. (360) 318-8554

Alternative sources are:

1. Backfill for Sand Drains	Miles Sand and Gravel, Oak Harbor, WA. Ryan Brownfield (360) 661-4497
2. Topsoil and Compost	Sunland Bark and Topsoil, Anacortes, WA. (360) 293-7188

Based on the final decision by Ecology, the actual source to be used will be identified by the Contracting Agency and that line item and pricing will become part of the contract.

Add the following new section:

1-02.6(1) Recycled Materials Proposal
(January 4, 2016 APWA GSP)

The Bidder shall submit with the Bid, its proposal for incorporating recycled materials into the project, using the form provided in the Contract Provisions.

1-02.9 Delivery of Proposal
(July 14, 2016 SkagitR)

Delete Section 1-02.9 and replace it with the following:

Each proposal shall be submitted in a sealed envelope, with the Project Name and Project Number as stated in the Call for Bids clearly marked on the outside of the envelope, or as otherwise required in the Bid Documents, to ensure proper handling and delivery.

The Contracting Agency will not open or consider any Bid Proposal that is received after the time specified in the Call for Bids for receipt of Bid Proposals, or received in a location other than that specified in the Call for Bids.

1-02.10 Withdrawing, Revising, or Supplementing Proposal
(July 23, 2015 APWA GSP)

Delete this section, and replace it with the following:

After submitting a physical Bid Proposal to the Contracting Agency, the Bidder may withdraw, revise, or supplement it if:

1. The Bidder submits a written request signed by an authorized person and physically delivers it to the place designated for receipt of Bid Proposals, and
2. The Contracting Agency receives the request before the time set for receipt of Bid Proposals, and
3. The revised or supplemented Bid Proposal (if any) is received by the Contracting Agency before the time set for receipt of Bid Proposals.

If the Bidder's request to withdraw, revise, or supplement its Bid Proposal is received before the time set for receipt of Bid Proposals, the Contracting Agency will return the unopened Proposal package to the Bidder. The Bidder must then submit the revised or supplemented package in its entirety. If the Bidder does not submit a revised or supplemented package, then its bid shall be considered withdrawn.

Late revised or supplemented Bid Proposals or late withdrawal requests will be date recorded by the Contracting Agency and returned unopened. Mailed, emailed, or faxed requests to withdraw, revise, or supplement a Bid Proposal are not acceptable.

1-02.13 Irregular Proposals
(December 30, 2022 APWA GSP)

Delete this section and replace it with the following:

1. A Proposal will be considered irregular and will be rejected if:
   a. The Bidder is not prequalified when so required;
   b. The authorized Proposal form furnished by the Contracting Agency is not used or is altered;
   c. The completed Proposal form contains any unauthorized additions, deletions, alternate Bids, or conditions;
   d. The Bidder adds provisions reserving the right to reject or accept the award, or enter into the Contract;
   e. A price per unit cannot be determined from the Bid Proposal;
   f. The Proposal form is not properly executed;
   g. The Bidder fails to submit or properly complete a subcontractor list (WSDOT Form 271-015), if applicable, as required in Section 1-02.6;
   h. The Bidder fails to submit or properly complete a Disadvantaged Business Enterprise Certification (WSDOT Form 272-056), if applicable, as required in Section 1-02.6;
   i. The Bidder fails to submit Written Confirmations (WSDOT Form 422-031) from each DBE firm listed on the Bidder's completed DBE Utilization Certification that they are in agreement with the bidder's DBE participation

commitment, if applicable, as required in Section 1-02.6, or if the written confirmation that is submitted fails to meet the requirements of the Special Provisions;

j. The Bidder fails to submit DBE Good Faith Effort documentation, if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to demonstrate that a Good Faith Effort to meet the Condition of Award was made;

k. The Bidder fails to submit a DBE Bid Item Breakdown (WSDOT Form 272-054), if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;

l. The Bidder fails to submit DBE Trucking Credit Forms (WSDOT Form 272-058), if applicable, as required in Section 1-02.6, or if the documentation that is submitted fails to meet the requirements of the Special Provisions;

m. The Bid Proposal does not constitute a definite and unqualified offer to meet the material terms of the Bid invitation; or

n. More than one Proposal is submitted for the same project from a Bidder under the same or different names.

2. A Proposal may be considered irregular and may be rejected if:

a. The Proposal does not include a unit price for every Bid item;

b. Any of the unit prices are excessively unbalanced (either above or below the amount of a reasonable Bid) to the potential detriment of the Contracting Agency;

c. Receipt of Addenda is not acknowledged;

d. A member of a joint venture or partnership and the joint venture or partnership submit Proposals for the same project (in such an instance, both Bids may be rejected); or

e. If Proposal form entries are not made in ink.

1-02.14 Disqualification of Bidders

(May 17, 2018 APWA GSP, Option B)

8. **<u>Supplemental Criteria</u>**

A. <u>Criterion</u>:

I. Qualified Bidders shall have experience with at least three projects similar in size and scope. Project experience must include working along waterways. The GCLL and GCLL Enhanced, must be installed by a subcontractor with experience with at least one million square feet of previous installation.

II. Subcontractor installing the shoreline planting identified in the plans and specifications shall have experience in installing plantings in shoreline buffer areas, as well as installing and maintaining solar operated irrigation systems.

III. Bidder shall have a Health and Safety program in accordance with WAC 296-843-120 & 20 CFR 1910.120(b) and medical monitoring in place in accordance with WAC 296-843-210 & 20 CFR 1910.120(f) for hazardous waste operations and emergency response (HAZWOPER). Bidder shall ensure all site workers and supervisors are properly certified with current

HAZWOPER and medical training in accordance with WAC 296-823-200 & 20 CFR 1910.120(f). Furthermore, the qualified Bidder shall have an Experience Modifier Rating (EMR) of less than 1.

B. Documentation: The Bidder shall submit a list of the three projects they have experience with that are similar in size and scope and include for each project the following information:

- Name of project
- The owner and contact information for the owner;
- A narrative of the scope of work and size of project worked on.

Delete this section and replace it with the following:

A Bidder will be deemed not responsible if the Bidder does not meet the mandatory bidder responsibility criteria in RCW 39.04.350(1), as amended; or does not meet Supplemental Criteria 1-7 listed in this Section.

The Contracting Agency will verify that the Bidder meets the mandatory bidder responsibility criteria in RCW 39.04.350(1), and Supplemental Criteria 1-2. Evidence that the Bidder meets Supplemental Criteria 3-7 shall be provided by the Bidder as stated later in this Section.

1. **Delinquent State Taxes**

A Criterion: The Bidder shall not owe delinquent taxes to the Washington State Department of Revenue without a payment plan approved by the Department of Revenue.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder does not owe delinquent taxes to the Washington State Department of Revenue, or if delinquent taxes are owed to the Washington State Department of Revenue, the Bidder must submit a written payment plan approved by the Department of Revenue, to the Contracting Agency by the deadline listed below.

2. **Federal Debarment**

A Criterion: The Bidder shall not currently be debarred or suspended by the Federal government.

B. Documentation: The Bidder shall not be listed as having an “active exclusion” on the U.S. government’s “System for Award Management” database (www.sam.gov).

3. **Subcontractor Responsibility**

A Criterion: The Bidder’s standard subcontract form shall include the subcontractor responsibility language required by RCW 39.06.020, and the Bidder shall have an established procedure which it utilizes to validate the

responsibility of each of its subcontractors. The Bidder's subcontract form shall also include a requirement that each of its subcontractors shall have and document a similar procedure to determine whether the sub-tier subcontractors with whom it contracts are also "responsible" subcontractors as defined by RCW 39.06.020.

B. Documentation: The Bidder, if and when required as detailed below, shall submit a copy of its standard subcontract form for review by the Contracting Agency, and a written description of its procedure for validating the responsibility of subcontractors with which it contracts.

4. **Claims Against Retainage and Bonds**

A Criterion: The Bidder shall not have a record of excessive claims filed against the retainage or payment bonds for public works projects in the three years prior to the bid submittal date, that demonstrate a lack of effective management by the Bidder of making timely and appropriate payments to its subcontractors, suppliers, and workers, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall submit a list of the public works projects completed in the three years prior to the bid submittal date that have had claims against retainage and bonds and include for each project the following information:

- Name of project
- The owner and contact information for the owner;
- A list of claims filed against the retainage and/or payment bond for any of the projects listed;
- A written explanation of the circumstances surrounding each claim and the ultimate resolution of the claim.

5. **Public Bidding Crime**

A Criterion: The Bidder and/or its owners shall not have been convicted of a crime involving bidding on a public works contract in the five years prior to the bid submittal date.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder and/or its owners have not been convicted of a crime involving bidding on a public works contract.

6. **Termination for Cause / Termination for Default**

A Criterion: The Bidder shall not have had any public works contract terminated for cause or terminated for default by a government agency in the five years prior to the bid submittal date, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency.

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder has not had any public works contract terminated for cause or terminated for default by a government agency in the five years prior to the bid submittal date; or if Bidder was terminated, describe the circumstances.

7. **Lawsuits**

A Criterion: The Bidder shall not have lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date that demonstrate a pattern of failing to meet the terms of contracts, unless there are extenuating circumstances and such circumstances are deemed acceptable to the Contracting Agency

B. Documentation: The Bidder, if and when required as detailed below, shall sign a statement (on a form to be provided by the Contracting Agency) that the Bidder has not had any lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date that demonstrate a pattern of failing to meet the terms of contracts, or shall submit a list of all lawsuits with judgments entered against the Bidder in the five years prior to the bid submittal date, along with a written explanation of the circumstances surrounding each such lawsuit. The Contracting Agency shall evaluate these explanations to determine whether the lawsuits demonstrate a pattern of failing to meet of terms of construction related contracts

As evidence that the Bidder meets the Supplemental Criteria stated above, the apparent low Bidder must submit to the Contracting Agency by 12:00 P.M. (noon) of the second business day following the bid submittal deadline, a written statement verifying that the Bidder meets the supplemental criteria together with supporting documentation (sufficient in the sole judgment of the Contracting Agency) demonstrating compliance with the Supplemental Criteria. The Contracting Agency reserves the right to request further documentation as needed from the low Bidder and documentation from other Bidders as well to assess Bidder responsibility and compliance with all bidder responsibility criteria. The Contracting Agency also reserves the right to obtain information from third-parties and independent sources of information concerning a Bidder's compliance with the mandatory and supplemental criteria, and to use that information in their evaluation. The Contracting Agency may consider mitigating factors in determining whether the Bidder complies with the requirements of the supplemental criteria.

The basis for evaluation of Bidder compliance with these mandatory and supplemental criteria shall include any documents or facts obtained by Contracting Agency (whether from the Bidder or third parties) including but not limited to: (i) financial, historical, or operational data from the Bidder; (ii) information obtained directly by the Contracting Agency from others for whom the Bidder has worked, or other public agencies or private enterprises; and (iii) any additional information obtained by the Contracting Agency which is believed to be relevant to the matter.

If the Contracting Agency determines the Bidder does not meet the bidder responsibility criteria above and is therefore not a responsible Bidder, the Contracting Agency shall notify the Bidder in writing, with the reasons for its determination. If the Bidder disagrees with this determination, it may appeal the determination within two (2)

business days of the Contracting Agency's determination by presenting its appeal and any additional information to the Contracting Agency. The Contracting Agency will consider the appeal and any additional information before issuing its final determination. If the final determination affirms that the Bidder is not responsible, the Contracting Agency will not execute a contract with any other Bidder until at least two business days after the Bidder determined to be not responsible has received the Contracting Agency's final determination.

Request to Change Supplemental Bidder Responsibility Criteria Prior To Bid: Bidders with concerns about the relevancy or restrictiveness of the Supplemental Bidder Responsibility Criteria may make or submit requests to the Contracting Agency to modify the criteria. Such requests shall be in writing, describe the nature of the concerns, and propose specific modifications to the criteria. Bidders shall submit such requests to the Contracting Agency no later than five (5) business days prior to the bid submittal deadline and address the request to the Project Engineer or such other person designated by the Contracting Agency in the Bid Documents.

1-02.15 Pre Award Information

(December 30, 2022 APWA GSP)

Revise this section to read:

Before awarding any contract, the Contracting Agency may require one or more of these items or actions of the apparent lowest responsible bidder:

1. A complete statement of the origin, composition, and manufacture of any or all materials to be used,
2. Samples of these materials for quality and fitness tests,
3. A progress schedule (in a form the Contracting Agency requires) showing the order of and time required for the various phases of the work,
4. A breakdown of costs assigned to any bid item,
5. Attendance at a conference with the Engineer or representatives of the Engineer,
6. Obtain, and furnish a copy of, a business license to do business in the city or county where the work is located.
7. Any other information or action taken that is deemed necessary to ensure that the bidder is the lowest responsible bidder.

1-03 Award and Execution of Contract

1-03.1 Consideration of Bids

(December 30, 2022 APWA GSP)

Revise the first paragraph to read:

After opening and reading proposals, the Contracting Agency will check them for correctness of extensions of the prices per unit and the total price. If a discrepancy exists between the price per unit and the extended amount of any bid item, the price per unit will control. If a minimum bid amount has been established for any item and the bidder's unit or lump sum price is less than the minimum specified amount, the Contracting Agency will unilaterally revise the unit or lump sum price, to the minimum specified amount and recalculate the extension. The total of extensions, corrected where necessary, including sales taxes where applicable and such additives and/or alternates as selected by the

Contracting Agency, will be used by the Contracting Agency for award purposes and to fix the Awarded Contract Price amount and the amount of the contract bond.

1-03.1(1) Identical Bid Totals

(December 30, 2022 APWA GSP)

Revise this section to read:

After opening Bids, if two or more lowest responsive Bid totals are exactly equal, then the tie-breaker will be the Bidder with an equal lowest bid, that proposed to use the highest percentage of recycled materials in the Project, per the form submitted with the Bid Proposal. If those percentages are also exactly equal, then the tie-breaker will be determined by drawing as follows: Two or more slips of paper will be marked as follows: one marked “Winner” and the other(s) marked “unsuccessful”. The slips will be folded to make the marking unseen. The slips will be placed inside a box. One authorized representative of each Bidder shall draw a slip from the box. Bidders shall draw in alphabetic order by the name of the firm as registered with the Washington State Department of Licensing. The slips shall be unfolded and the firm with the slip marked “Winner” will be determined to be the successful Bidder and eligible for Award of the Contract. Only those Bidders who submitted a Bid total that is exactly equal to the lowest responsive Bid, and with a proposed recycled materials percentage that is exactly equal to the highest proposed recycled materials amount, are eligible to draw.

1-03.3 Execution of Contract

(January 19, 2022 APWA GSP)

Revise this section to read:

Within 3 calendar days of Award date (not including Saturdays, Sundays and Holidays), the successful Bidder shall provide the information necessary to execute the Contract to the Contracting Agency. The Bidder shall send the contact information, including the full name, email address, and phone number, for the authorized signer and bonding agent to the Contracting Agency.

Copies of the Contract Provisions, including the unsigned Form of Contract, will be available for signature by the successful bidder on the first business day following award. The number of copies to be executed by the Contractor will be determined by the Contracting Agency.

Within 20 calendar days after the award date, the successful bidder shall return the signed Contracting Agency-prepared contract, an insurance certification as required by Section 1-07.18, a satisfactory bond as required by law and Section 1-03.4, the Transfer of Coverage form for the Construction Stormwater General Permit with sections I, III, and VIII completed when provided. Before execution of the contract by the Contracting Agency, the successful bidder shall provide any pre-award information the Contracting Agency may require under Section 1-02.15.

Until the Contracting Agency executes a contract, no proposal shall bind the Contracting Agency nor shall any work begin within the project limits or within Contracting Agency-furnished sites. The Contractor shall bear all risks for any work begun outside such areas and for any materials ordered before the contract is executed by the Contracting Agency.

If the bidder experiences circumstances beyond their control that prevents return of the contract documents within the calendar days after the award date stated above, the Contracting Agency may grant up to a maximum of 10 additional calendar days for return of the documents, provided the Contracting Agency deems the circumstances warrant it.

1-03.4 Contract Bond

(July 23, 2015 APWA GSP)

Delete the first paragraph and replace it with the following:

The successful bidder shall provide executed payment and performance bond(s) for the full contract amount. The bond may be a combined payment and performance bond; or be separate payment and performance bonds. In the case of separate payment and performance bonds, each shall be for the full contract amount. The bond(s) shall:

1. Be on Contracting Agency-furnished form(s);
2. Be signed by an approved surety (or sureties) that:
    a. Is registered with the Washington State Insurance Commissioner, and
    b. Appears on the current Authorized Insurance List in the State of Washington published by the Office of the Insurance Commissioner,
3. Guarantee that the Contractor will perform and comply with all obligations, duties, and conditions under the Contract, including but not limited to the duty and obligation to indemnify, defend, and protect the Contracting Agency against all losses and claims related directly or indirectly from any failure:
    a. Of the Contractor (or any of the employees, subcontractors, or lower tier subcontractors of the Contractor) to faithfully perform and comply with all contract obligations, conditions, and duties, or
    b. Of the Contractor (or the subcontractors or lower tier subcontractors of the Contractor) to pay all laborers, mechanics, subcontractors, lower tier subcontractors, material person, or any other person who provides supplies or provisions for carrying out the work;
4. Be conditioned upon the payment of taxes, increases, and penalties incurred on the project under titles 50, 51, and 82 RCW; and
5. Be accompanied by a power of attorney for the Surety's officer empowered to sign the bond; and
6. Be signed by an officer of the Contractor empowered to sign official statements (sole proprietor or partner). If the Contractor is a corporation, the bond(s) must be signed by the president or vice president, unless accompanied by written proof of the authority of the individual signing the bond(s) to bind the corporation (i.e., corporate resolution, power of attorney, or a letter to such effect signed by the president or vice president).

1-03.7 Judicial Review

(December 30, 2022 APWA GSP)

Revise this section to read:

All decisions made by the Contracting Agency regarding the Award and execution of the Contract or Bid rejection shall be conclusive subject to the scope of judicial review permitted under Washington Law. Such review, if any, shall be timely filed in the Superior Court of the county where the Contracting Agency headquarters is located, provided that

where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction.

1-04 Scope of the Work

1-04.2 Coordination of Contract Documents, Plans, Special Provisions, Specifications, and Addenda

The first paragraph of Section 1-04.2 is supplemented with the following:

All tasks described in these specifications and shown on the project plans are the responsibility of the contractor, unless otherwise specified.

*(December 30, 2022 APWA GSP)*Revise the second paragraph to read:

Any inconsistency in the parts of the contract shall be resolved by following this order of precedence (e.g., 1 presiding over 2, 2 over 3, 3 over 4, and so forth):

1. Addenda,
2. Proposal Form,
3. Special Provisions,
4. Contract Plans,
5. Standard Specifications,
6. Contracting Agency's Standard Plans or Details (if any), and
7. WSDOT Standard Plans for Road, Bridge, and Municipal Construction.

1-04.4 Changes

(January 19, 2022 APWA GSP)

The first two sentences of the last paragraph of Section 1-04.4 are deleted.

1-04.6 Variation in Estimated Quantities

(May 25, 2006 APWA GSP)

Supplement this section with the following:

The quantities for "Afterhours Temporary Dewatering System Operation", "Additional Tank Mobilization" and "Additional Tank Operation" have been entered into the Proposal only to provide a common proposal for bidders. Actual quantities will be determined in the field as the work progresses, and will be paid at the original bid price, regardless of final quantity. These bid items shall not be subject to the provisions of 1-04.6 of the Standard Specifications.

1-04.11 Final Cleanup

(July 26, 2024 SkagitR)

Section 1-04.11 is supplemented with the following:

Disposal of Waste

The Engineer will identify and characterize and classify any waste not suitable to be incorporated into the landfill. Obtain waste profile approval from the facility prior to shipment.

Remove temporary erosion control measures after completion of the project, if approved by the Engineer.

Add the following as new Section 1-04.12 to Section 1-04
(July 26, 2024 SkagitR)

1-04.12 Access to Work Areas, Use of Project Site, General Site Setup

Establish site controls, staging areas, health and safety zones, and erosion control measures, prior to the start of work. These include stabilized construction entrance, silt fence around the entrance, turbidity curtain in the Padilla Bay (Bay), and straw wattles across the south swale, per the contract plans and provisions.

Install temporary access roads and other elements for site staging, as needed. The existing stockpiles east of the former mill, as well as the aboveground berms outside the landfill entrance, may be used as sacrificial material for use on site, such as for temporary access roads. Imported material for the purpose of establishing staging areas, temporary access roads, and general site prep, shall not be used until approved by the Engineer.

Contractor is responsible for site security. Install temporary security chain link fence around the site.

All costs associated with work for site setup not part of other Bid Items are incidental to the Mobilization Bid Item.

1-05 Control of Work

Working Drawings

Section 1-05.3 is supplemented with the following:

(September 3, 2019)
When submittals require review by the railroad, the Engineer will require up to *** seven (7) *** calendar days from the date the submittals are received until they are returned to the Contractor. If a submittal is returned unapproved and then resubmitted, then an additional review time of up to *** seven (7)*** calendar days will be required.

If more than *** seven (7) *** calendar days are required for the Engineer's review of any individual submittal or resubmittal, an extension of time will be considered in accordance with Section 1-08.8.

(******)
1-05.3(1) Submittals
(July 26, 2024 SkagitR)

Engineer will require a minimum of seven (7) business days to review and respond to submittals unless otherwise noted. Revise and resubmit, if asked to do so, until the

submittal is accepted. Contractor shall revise submittals to the satisfaction of the Engineer prior to beginning of work.

The following table is a summary of the submittals or notifications required of the Contractor. It shall be understood that in addition to complying with the submittal requirements in this table, all other applicable submittal requirements specified in these Special Provisions or WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, whether they are listed or not listed in the summary table, are considered part of the contract, and shall be met. All costs to comply with the submittal and notification requirements shall be incidental to the appliable bid items for the work involved in the Contract.

Submittal	Special Provision and/or Specifications
Access and Staging Plan	1-04.12 Access to Work Areas, Use of Project Site, General Site Setup
Health and Safety Plan (HASP)	1-07.1(2) Health and Safety
Work Plan	1-07.1(2) Health and Safety 2-13 Earthwork for Landfill 8-01.3(17) Temporary Dewatering Approach 8-01.3(1)C Water Treatment System
Temporary Erosion Control Plan (TESC) Spill Prevention, Control and Countermeasures Plan (SPCC)	1-07.15(1) Spill Prevention, Control and Countermeasures Plan 8-01.3(1)A1 Temporary Erosion and Sediment Control Plan
Discharge Monitoring Reports	8-01.3(1)B Erosion and Sediment Control (ESC) Lead
Survey Results	1-05.4 Conformity with and Deviations from Plans and Stakes
Irrigation Plan	8-03.3(2) Submittals
Material Submittals, Shop Drawings, and miscellaneous supporting documentation	1-08.3(2)A Type A Progress Schedule 2-13 Earthwork for Landfill 2-13.3(1) Imported Soil Sample and Test Results 8-01.3(7) Stabilized Construction Entrance 8-02.3(5) Roadside Seeding, Lawn and Planting Area Preparation, and Material 8-33 Landfill Gas Collection System 9-33 Construction Geosynthetics 9-38 Landfill Cap and Gas System Materials
Record Drawings	1-05.18 Record Drawings

Submissions of the Contractor's daily excavations and elevations shall be submitted daily. Submit surveys, weight tickets, etc., at the completion of each phase of work.

Conformity with and Deviations from Plans and Stakes

Section 1-05.4 is supplemented with the following:

Licensed Surveyors

(July 26, 2024 SkagitR)

The Contractor shall be responsible for reestablishing or locating legal survey markers such as GLO monuments or property corner monuments, conduct boundary surveys to determine Contracting Agency right-of-way locations, and obtain, review and analyze

deeds and records as necessary to determine these boundaries. The Contracting Agency will provide “rights of entry” as needed by the Contractor to perform the work.

The Contractor shall brush out or clear and stake or mark the right-of-way lines as designated by the Engineer.

The Contractor shall inform the Engineer when monuments are discovered that were not identified in the Plans and construction activity may disturb or damage the monuments. All monuments noted on the plans “DO NOT DISTURB” shall be protected throughout the length of the project or be replaced at Contractors expense.

When required, the Contractor shall prepare and file a Record of Survey map in accordance with RCW 58.09 and provide a recorded copy to the Contracting Agency. The Contracting Agency will provide all existing base maps, existing horizontal and vertical control, and other material available with Washington State Plane Coordinate information to the Contractor. The Contracting Agency will also provide maps, plan sheets, and/or aerial photographs clearly identifying the limits of the areas to be surveyed. The Contractor shall establish Washington State Plane Coordinates on all points required in the Record of Survey and other points designated in the Contract documents.

Existing right of way documentation, existing base maps, existing horizontal and vertical control descriptions, maps, plan sheets, aerial photographs and all other available material may be viewed by prospective bidders at the office of the Engineer.

The Contractor shall perform all of the necessary calculations for the contracted survey work and shall provide copies of these calculations to the Contracting Agency. Electronic files of all survey data shall be provided and in a format acceptable to the Contracting Agency.

All survey work performed by the Contractor shall conform to all applicable sections of the Revised Code of Washington and the Washington Administrative Code.

The Contractor shall provide all traffic control, signing, and temporary traffic control devices in order to provide a safe work zone.

Contractor is responsible for all project surveying, including for progress payments. Contracting Agency may elect to conduct quantity surveys during the work. Contractor shall maintain control points, baselines, boundaries, and alignments and verify grades during work as needed.

Payment

Payment will be made in accordance with Section 1-09.6 for the following bid item when included in the proposal:

“Licensed Surveying”, Force Account.
For the purpose of providing a common proposal for all bidders, the Contracting Agency has entered an amount for the item "Licensed Surveying" in the bid proposal to become a part of the total bid by the Contractor.

1-05.7 Removal of Defective and Unauthorized Work

(October 1, 2005 APWA GSP)

Supplement this section with the following:

If the Contractor fails to remedy defective or unauthorized work within the time specified in a written notice from the Engineer, or fails to perform any part of the work required by the Contract Documents, the Engineer may correct and remedy such work as may be identified in the written notice, with Contracting Agency forces or by such other means as the Contracting Agency may deem necessary.

If the Contractor fails to comply with a written order to remedy what the Engineer determines to be an emergency situation, the Engineer may have the defective and unauthorized work corrected immediately, have the rejected work removed and replaced, or have work the Contractor refuses to perform completed by using Contracting Agency or other forces. An emergency situation is any situation when, in the opinion of the Engineer, a delay in its remedy could be potentially unsafe, or might cause serious risk of loss or damage to the public.

Direct or indirect costs incurred by the Contracting Agency attributable to correcting and remedying defective or unauthorized work, or work the Contractor failed or refused to perform, shall be paid by the Contractor. Payment will be deducted by the Engineer from monies due, or to become due, the Contractor. Such direct and indirect costs shall include in particular, but without limitation, compensation for additional professional services required, and costs for repair and replacement of work of others destroyed or damaged by correction, removal, or replacement of the Contractor's unauthorized work.

No adjustment in contract time or compensation will be allowed because of the delay in the performance of the work attributable to the exercise of the Contracting Agency's rights provided by this Section.

The rights exercised under the provisions of this section shall not diminish the Contracting Agency's right to pursue any other avenue for additional remedy or damages with respect to the Contractor's failure to perform the work as required.

1-05.11 Final Inspection

Delete this section and replace it with the following:

1-05.11 Final Inspections and Operational Testing

(October 1, 2005 APWA GSP)

1-05.11(1) Substantial Completion Date

When the Contractor considers the work to be substantially complete, the Contractor shall so notify the Engineer and request the Engineer establish the Substantial Completion Date. The Contractor's request shall list the specific items of work that remain to be completed in order to reach physical completion. The Engineer will schedule an inspection of the work with the Contractor to determine the status of completion. The Engineer may also establish the Substantial Completion Date unilaterally.

If, after this inspection, the Engineer concurs with the Contractor that the work is substantially complete and ready for its intended use, the Engineer, by written notice to the Contractor, will set the Substantial Completion Date. If, after this inspection the Engineer does not consider the work substantially complete and ready for its intended use, the Engineer will, by written notice, so notify the Contractor giving the reasons therefor.

Upon receipt of written notice concurring in or denying substantial completion, whichever is applicable, the Contractor shall pursue vigorously, diligently and without unauthorized interruption, the work necessary to reach Substantial and Physical Completion. The Contractor shall provide the Engineer with a revised schedule indicating when the Contractor expects to reach substantial and physical completion of the work.

The above process shall be repeated until the Engineer establishes the Substantial Completion Date and the Contractor considers the work physically complete and ready for final inspection.

1-05.11(2) Final Inspection and Physical Completion Date

When the Contractor considers the work physically complete and ready for final inspection, the Contractor by written notice, shall request the Engineer to schedule a final inspection. The Engineer will set a date for final inspection. The Engineer and the Contractor will then make a final inspection and the Engineer will notify the Contractor in writing of all particulars in which the final inspection reveals the work incomplete or unacceptable. The Contractor shall immediately take such corrective measures as are necessary to remedy the listed deficiencies. Corrective work shall be pursued vigorously, diligently, and without interruption until physical completion of the listed deficiencies. This process will continue until the Engineer is satisfied the listed deficiencies have been corrected.

If action to correct the listed deficiencies is not initiated within 7 days after receipt of the written notice listing the deficiencies, the Engineer may, upon written notice to the Contractor, take whatever steps are necessary to correct those deficiencies pursuant to Section 1-05.7.
The Contractor will not be allowed an extension of contract time because of a delay in the performance of the work attributable to the exercise of the Engineer's right hereunder.

Upon correction of all deficiencies, the Engineer will notify the Contractor and the Contracting Agency, in writing, of the date upon which the work was considered physically complete. That date shall constitute the Physical Completion Date of the contract, but shall not imply acceptance of the work or that all the obligations of the Contractor under the contract have been fulfilled.

1-05.11(3) Operational Testing

It is the intent of the Contracting Agency to have at the Physical Completion Date a complete and operable system. Therefore when the work involves the installation of machinery or other mechanical equipment; street lighting, electrical distribution or signal systems; irrigation systems; buildings; or other similar work it may be desirable for the Engineer to have the Contractor operate and test the work for a period of time after final inspection but prior to the physical completion date. Whenever items of work are listed in the Contract Provisions for operational testing they shall be fully tested under operating conditions for the time period specified to ensure their acceptability prior to the Physical Completion Date. During and following the test period, the Contractor shall correct any

items of workmanship, materials, or equipment which prove faulty, or that are not in first class operating condition. Equipment, electrical controls, meters, or other devices and equipment to be tested during this period shall be tested under the observation of the Engineer, so that the Engineer may determine their suitability for the purpose for which they were installed. The Physical Completion Date cannot be established until testing and corrections have been completed to the satisfaction of the Engineer.

The costs for power, gas, labor, material, supplies, and everything else needed to successfully complete operational testing, shall be included in the unit contract prices related to the system being tested, unless specifically set forth otherwise in the proposal.

Operational and test periods, when required by the Engineer, shall not affect a manufacturer's guaranties or warranties furnished under the terms of the contract.

Add the following new section:

1-05.18 Record Drawings
(March 8, 2013 APWA GSP)

The Contractor shall maintain one set of full size plans for Record Drawings, updated with clear and accurate red-lined field revisions on a daily basis, and within 2 business days after receipt of information that a change in Work has occurred. The Contractor shall not conceal any work until the required information is recorded.

This Record Drawing set shall be used for this purpose alone, shall be kept separate from other Plan sheets, and shall be clearly marked as Record Drawings. These Record Drawings shall be kept on site at the Contractor's field office, and shall be available for review by the Contracting Agency at all times. The Contractor shall bring the Record Drawings to each progress meeting for review.

The preparation and upkeep of the Record Drawings is to be the assigned responsibility of a single, experienced, and qualified individual. The quality of the Record Drawings, in terms of accuracy, clarity, and completeness, is to be adequate to allow the Contracting Agency to modify the computer-aided drafting (CAD) Contract Drawings to produce a complete set of Record Drawings for the Contracting Agency without further investigative effort by the Contracting Agency.

The Record Drawing markups shall document all changes in the Work, both concealed and visible. Items that must be shown on the markups include but are not limited to:

- Actual dimensions, arrangement, and materials used when different than shown in the Plans.
- Changes made by Change Order or Field Order.
- Changes made by the Contractor.
- Accurate locations of storm sewer, sanitary sewer, water mains and other water appurtenances, structures, conduits, light standards, vaults, width of roadways, sidewalks, landscaping areas, building footprints, channelization and pavement markings, etc. Include pipe invert elevations, top of castings (manholes, inlets, etc.).

If the Contract calls for the Contracting Agency to do all surveying and staking, the Contracting Agency will provide the elevations at the tolerances the Contracting Agency requires for the Record Drawings.

When the Contract calls for the Contractor to do the surveying/staking, the applicable tolerance limits include, but are not limited to the following:

	Vertical	Horizontal
As-built sanitary & storm invert and grate elevations	± 0.01 foot	± 0.01 foot
As-built monumentation	± 0.001 foot	± 0.001 foot
As-built waterlines, inverts, valves, hydrants	± 0.10 foot	± 0.10 foot
As-built ponds/swales/water features	± 0.10 foot	± 0.10 foot
As-built buildings (fin. Floor elev.)	± 0.01 foot	± 0.10 foot
As-built gas lines, power, TV, Tel, Com	± 0.10 foot	± 0.10 foot
As-built signs, signals, etc.	N/A	± 0.10 foot

Making Entries on the Record Drawings:

- Use erasable colored pencil (not ink) for all markings on the Record Drawings, conforming to the following color code:
- Additions - Red
- Deletions - Green
- Comments - Blue
- Dimensions - Graphite
- Provide the applicable reference for all entries, such as the change order number, the request for information (RFI) number, or the approved shop drawing number.
- Date all entries.
- Clearly identify all items in the entry with notes similar to those in the Contract Drawings (such as pipe symbols, centerline elevations, materials, pipe joint abbreviations, etc.).

The Contractor shall certify on the Record Drawings that said drawings are an accurate depiction of built conditions, and in conformance with the requirements detailed above. The Contractor shall submit final Record Drawings to the Contracting Agency. Contracting Agency acceptance of the Record Drawings is one of the requirements for achieving Physical Completion.

Payment will be made for the following bid item:

Record Drawings (Minimum Bid $15,000)	Lump Sum

Payment for this item will be made on a prorated monthly basis for work completed in accordance with this section up to 75% of the lump sum bid. The final 25% of the lump sum item will be paid upon submittal and approval of the completed Record Drawings set prepared in conformance with these Special Provisions.

A minimum bid amount has been entered in the Bid Proposal for this item. The Contractor must bid at least that amount.

1-06 Control of Material

1-06.6 Recycled Materials

(January 4, 2016 APWA GSP)

Delete this section, including its subsections, and replace it with the following:

The Contractor shall make their best effort to utilize recycled materials in the construction of the project. Approval of such material use shall be as detailed elsewhere in the Standard Specifications.

Prior to Physical Completion the Contractor shall report the quantity of recycled materials that were utilized in the construction of the project for each of the items listed in Section 9-03.21. The report shall include hot mix asphalt, recycled concrete aggregate, recycled glass, steel furnace slag and other recycled materials (e.g. utilization of on-site material and aggregates from concrete returned to the supplier). The Contractor's report shall be provided on DOT form 350-075 Recycled Materials Reporting.

1-07 Legal Relations and Responsibilities to the Public

1-07.1 Laws to be Observed

(October 1, 2005 APWA GSP)

Supplement this section with the following:

In cases of conflict between different safety regulations, the more stringent regulation shall apply.

The Washington State Department of Labor and Industries shall be the sole and paramount administrative agency responsible for the administration of the provisions of the Washington Industrial Safety and Health Act of 1973 (WISHA).

The Contractor shall maintain at the project site office, or other well known place at the project site, all articles necessary for providing first aid to the injured. The Contractor shall establish, publish, and make known to all employees, procedures for ensuring immediate removal to a hospital, or doctor's care, persons, including employees, who may have been injured on the project site. Employees should not be permitted to work on the project site before the Contractor has established and made known procedures for removal of injured persons to a hospital or a doctor's care.

The Contractor shall have sole responsibility for the safety, efficiency, and adequacy of the Contractor's plant, appliances, and methods, and for any damage or injury resulting from their failure, or improper maintenance, use, or operation. The Contractor shall be solely and completely responsible for the conditions of the project site, including safety for all persons and property in the performance of the work. This requirement shall apply continuously, and not be limited to normal working hours. The required or implied duty of the Engineer to conduct construction review of the Contractor's performance does not, and shall not, be intended to include review and adequacy of the Contractor's safety measures in, on, or near the project site.

1-07.1(2) Health and Safety

(July 26, 2024 Skagit R)

Section 1-07.1(2) is supplemented with the following:

(*****)

Constituents above acceptable risk level present in site soil and groundwater. All workers must be trained in hazardous waste operations and emergency response (HAZWOPER) with current certifications and medical monitoring. At least one person must also have 8-hour supervisory certification. All workers within BNSF right-of-way must have current railroad safety training and rail industry background screening. See the following links: www.BNSFContractor.com. www.everifile.com

Prepare and submit a Work Plan and a site-specific Health and Safety Plan (HASP) for the project. These shall be submitted and accepted by the engineer prior to mobilization. Work plan shall describe the methods and means, material, procedures, traffic control measures, sequencing, schedule, subcontractors, etc. Current worker certifications (HAZWOPER and medical monitoring) shall be included in the HASP. Contractor's HASP shall be at least as stringent as engineer's HASP.

Landfill gas is present in the subsurface. In previous test pit exploration efforts at select locations, explosive conditions were not encountered. Conduct air monitoring during earthwork for presence of explosive gas and other volatiles. Calibrate instruments daily until safe levels are established.

Stop work immediately if explosive gases are detected at 15% of lower explosive limits until the gas vents and safe levels are verified.

Comply with State of Washington Division of Safety and Health (DOSH) requirements. Based on volatile detected, personal air samples for volatile organic compounds (VOCS) may be required.

All costs to comply with the above special provision for health and safety requirements are incidental to the contract and are the responsibility of the Contractor. The Contractor shall include all related costs in the associated bid prices of the contract.

There is a possibility of encountering small quantities of hazardous waste during regrading within the landfill. Exercise caution and inspect the exposed subgrade regularly for presence of containers and canisters, etc. Segregate if encountered for characterization and disposal in an appropriate facility.

Health and Safety shall include, but is not limited to, Health and Safety Officer, Personal Protective Equipment (disposable clothing), Air Monitoring Equipment, Personal Air Samples, and anything related to safety. All Health and Safety work items shall be incidental to related work.

1-07.1(4) Wells

Section 1-07.1(4) is supplemented with the following:

(*****)

All existing wells and probes will be abandoned by Engineer prior to the start of work. All future wells and probes will be installed by Engineer after completion of work. Wells and probes abandonment and installations are not in the Contractor’s scope of work.

1-07.2 State Taxes

Delete this section, including its sub-sections, in its entirety and replace it with the following:

1-07.2 State Sales Tax
(June 27, 2011 APWA GSP)

The Washington State Department of Revenue has issued special rules on the State sales tax. Sections 1-07.2(1) through 1-07.2(3) are meant to clarify those rules. The Contractor should contact the Washington State Department of Revenue for answers to questions in this area. The Contracting Agency will not adjust its payment if the Contractor bases a bid on a misunderstood tax liability.

The Contractor shall include all Contractor-paid taxes in the unit bid prices or other contract amounts. In some cases, however, state retail sales tax will not be included. Section 1-07.2(2) describes this exception.

The Contracting Agency will pay the retained percentage (or release the Contract Bond if a FHWA-funded Project) only if the Contractor has obtained from the Washington State Department of Revenue a certificate showing that all contract-related taxes have been paid (RCW 60.28.051). The Contracting Agency may deduct from its payments to the Contractor any amount the Contractor may owe the Washington State Department of Revenue, whether the amount owed relates to this contract or not. Any amount so deducted will be paid into the proper State fund.

1-07.2(1) State Sales Tax — Rule 171

WAC 458-20-171, and its related rules, apply to building, repairing, or improving streets, roads, etc., which are owned by a municipal corporation, or political subdivision of the state, or by the United States, and which are used primarily for foot or vehicular traffic. This includes storm or combined sewer systems within and included as a part of the street or road drainage system and power lines when such are part of the roadway lighting system. For work performed in such cases, the Contractor shall include Washington State Retail Sales Taxes in the various unit bid item prices, or other contract amounts, including those that the Contractor pays on the purchase of the materials, equipment, or supplies used or consumed in doing the work.

1-07.2(2) State Sales Tax — Rule 170

WAC 458-20-170, and its related rules, apply to the constructing and repairing of new or existing buildings, or other structures, upon real property. This includes, but is not limited to, the construction of streets, roads, highways, etc., owned by the state of Washington; water mains and their appurtenances; sanitary sewers and sewage disposal systems unless such sewers and disposal systems are within, and a part of, a street or road drainage system; telephone, telegraph, electrical power distribution lines, or other conduits or lines in or above streets or roads, unless such power lines become a part of a street or road lighting system; and installing or attaching of any article of tangible personal property in or to real property, whether or not such personal property becomes a part of the realty by virtue of installation.

For work performed in such cases, the Contractor shall collect from the Contracting Agency, retail sales tax on the full contract price. The Contracting Agency will automatically

add this sales tax to each payment to the Contractor. For this reason, the Contractor shall not include the retail sales tax in the unit bid item prices, or in any other contract amount subject to Rule 170, with the following exception.

Exception: The Contracting Agency will not add in sales tax for a payment the Contractor or a subcontractor makes on the purchase or rental of tools, machinery, equipment, or consumable supplies not integrated into the project. Such sales taxes shall be included in the unit bid item prices or in any other contract amount.

1-07.2(3) Services

The Contractor shall not collect retail sales tax from the Contracting Agency on any contract wholly for professional or other services (as defined in Washington State Department of Revenue Rules 138 and 244).

Environmental Regulations

Section 1-07.5 is supplemented with the following:

(September 20, 2010)

Environmental Commitments

The following Provisions summarize the requirements, in addition to those required elsewhere in the Contract, imposed upon the Contracting Agency by the various documents referenced in the Special Provision **Permits and Licenses**. Throughout the work, the Contractor shall comply with the following requirements:

(August 4, 2014)
The Contractor shall submit a written notification to the Engineer no later than 10 calendar days prior to beginning any ground disturbing activities *** within the project limits***. The Contractor shall not commence any such ground disturbing activities until the monitor is present.

(April 1, 2019)
The Contractor shall notify the Engineer a minimum of *** three (3) *** calendar days prior to commencing any work in sensitive areas, mitigation areas, and wetland buffers. Installation of construction fencing is excluded from this notice requirement.

(April 1, 2019)
No *** disturbance *** is allowed within *** three (3) *** feet of *** the existing power pole and guy wire near the landfill entrance ***.

(July 26, 2024)
No disturbance shall occur beyond the existing toe of the landfill without written approval from the Engineer, specifically along the existing mudflats on the eastern boundary in the existing mudflats.

(August 3, 2009)

Payment

All costs to comply with this special provision for the environmental commitments and requirements are incidental to the contract and are the responsibility of the Contractor. The Contractor shall include all related costs in the associated bid prices of the contract.

1-07.5(4) Air Quality

Section 1-07.5(4) Air Quality is supplemented with the following:

(*****)

1-07.5(4)B Fugitive Dust

Fugitive dust control shall include all equipment and personnel necessary to minimize dust generation. All costs associated with fugitive dust control shall be incidental to related Work items.

(*****)

1-07.5(4)D Exhaust Emissions

Employ best management practices to minimize exhaust emissions such as use of Tier III or Tier IV equipment, maintaining the equipment and vehicles in good working order, and turning off engines when not in use more than 10 minutes.

Section 1-07.5 is supplemented with the following:

(*****)

1-07.5(8) Heron Habitat Protection and Preservation

1-07.5(8)A Noise and Visual Disturbance Mitigation for Heron Habitat

A heronry is present on the south side of South March Point Road which is sensitive to noise levels as well as visual disturbance during their breeding season, typically from mid-February through August/September time frame. Actual end of breeding season varies annually. Review the Heron Management Plan prepared by Engineer for requirements. Engineer will conduct all noise and biological monitoring. The allowable total noise level at the edge of the heronry is 85 decibels. During all activities, Engineer will conduct noise monitoring and biological observations of the heronry. If any issues are identified by the Engineer, such as excessive noise level, Engineer will stop work until an appropriate mitigation measure is identified and implemented. issue is adequately mitigated.

1-07.5(8)B Construction Requirements to be Implemented for Heron Protection

Work Window

1. All work shall be completed between April 1 and October 31.

Staging

1. The staging area should be located where it is least visible from the heronry during the herons' breeding season. The approximate location of initial staging location is shown on the Plans. Relocate the staging areas, when needed to complete the work.

Workzone

1. Conduct the perimeter construction activities in clockwise direction starting at the site entrance, so that the majority of the perimeter work closest to the heronry will be conducted after the breeding season, as shown on the plans.

Equipment

1. Stage heavy equipment at points furthest from heron nesting areas.
2. Implement a no-idling policy.
3. Operate at a steady rate to minimize equipment power demands and reduce the associated engine revving, when possible.
4. Install more efficient engine exhaust silencers.
5. Apply sound dampening material and sound absorption layers to vibrating panels and covers.
6. Limit run times to reduce hourly sound level averages.
7. Limit the number of trips across the site and the number of pieces of equipment running at the same time.
8. If tracked equipment must be used, avoid, or minimize driving over surfaces that may create higher noise levels, such as concrete, pavement, and packed gravel.
9. Install modified/ambient sensitive backup warning devices or use backup observers on all vehicles/heavy equipment.
10. Require well-maintained bed liners for all trucks performing import/export haul. Bed liners dampen noise from materials that are loaded and unloaded from the truck bed.
11. Ensure truck loading methods involve careful placement of material in the beds versus dropping the material from higher distances.
12. Prohibit truck tailgate banging. All truck tailgates shall be secured to prevent excessive noise from banging.

Noise mitigation techniques for generators/pumps/other small equipment are as follows:

1. Locate equipment within a sound dampening enclosure.
2. Install more efficient engine exhaust silencers
3. Apply sound dampening material and sound absorption layers to vibrating panels and covers.
4. Locate on-site activities as far away from the heronry and heron activity (including the lagoon) as practical.
5. Exclude/limit the portion of South March Point Road next to the heronry as a site access/haul route to the extent practicable. Direct haul routes and site traffic (workers, vendors, etc.) to/from the north and northwest, away from the portion of South March Point Road adjacent to the heronry.
6. Avoid louder work activities on windy, cool, or rainy days to the extent practical.
7. Prevent loud noises and refrain from large equipment moves during large vocalizations (chortles/clucks) by the herons and/or observed disturbances to the colony by predator activity (bald eagles, red-tailed hawks, etc.).
8. If lighting is needed, use covered and down-shielded lights and direct away from the heronry, foraging areas, and existing trees on the project site.

Permits and Licenses

Section 1-07.6 is supplemented with the following:

(January 2, 2018)
The Contracting Agency has or will obtain the below-listed permit(s) for this project. A copy of the permit(s) is attached as an appendix for informational purposes. Copies of these permits, including a copy of the Transfer of Coverage form, when applicable, are required to be onsite at all times.

Contact with the permitting agencies, concerning the below-listed permit(s), shall be made through the Engineer. The Contractor shall obtain additional permits as necessary. All costs to obtain and comply with additional permits shall be included in the applicable Bid items for the Work involved.

*** USACE Permit Under Nationwide Permit 38

Construction Stormwater Discharge Permit

Sanitary Sewer Discharge Permit ***

Load Limits

(July 26, 2024 SkagitR)

Section 1-07.7 is supplemented with the following:

(******)
If the sources of materials provided by the Contractor necessitates hauling over roads other than State Highways, the Contractor shall, at the Contractor's expense, make all arrangements for the use of the haul routes.

Site access shall only be from the west. All construction traffic shall access the site from the west and shall not drive on S. March Point Road between highway 20 and the site, along the heronry. Prepare a Traffic Control Plan showing the routine and emergency access route(s) and warning signage on the road.

Wages

General

Section 1-07.9(1) is supplemented with the following:

(January 10, 2024)
The Federal wage rates incorporated in this contract have been established by the Secretary of Labor under United States Department of Labor General Decision No. WA20240001.

The State rates incorporated in this contract are applicable to all construction activities associated with this contract.

1-07.9(5)A Required Documents

(July 8, 2024 APWA GSP)

This section is revised to read as follows:

All Statements of Intent to Pay Prevailing Wages, Affidavits of Wages Paid and Certified Payrolls, including a signed Statement of Compliance for Federal-aid projects, shall be submitted to the Engineer and to the State L&I online Prevailing Wage Intent & Affidavit (PWIA) system. When apprenticeship is a requirement of the contract, include in PWIA all apprentices.

1-07.9(5)A Apprentices

(December 4, 2024 SkagitR)

Supplement this section with the following:

The contractor shall comply with all Apprentice Utilization Requirements as outlined in the bid package.

1-07.11 Requirements for Nondiscrimination

(October 1, 2020 APWA GSP, Option A)

Supplement this section with the following:

Disadvantaged Business Enterprise Participation

The Disadvantaged Business Enterprise (DBE) requirements of 49 CFR Part 26 and USDOT's official interpretations (i.e., Questions & Answers) apply to this Contract. As such, the requirements of this Contract are to make affirmative efforts to solicit DBEs, provide information on who submitted a Bid or quote and to report DBE participation monthly as described elsewhere in these Contract Provisions. No preference will be included in the evaluation of Bids/Proposals, no minimum level of DBE participation shall be required as a Condition of Award and Bids/Proposals may not be rejected or considered non-responsive on that basis.

DBE Abbreviations and Definitions

Broker – A business firm that provides a bona fide service, such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment, materials, or supplies required for the performance of the Contract, or, persons/companies who arrange or expedite transactions.

Certified Business Description – Specific descriptions of work the DBE is certified to perform, as identified in the Certified Firm Directory, under the Vendor Information page.

Certified Firm Directory – A database of all Minority, Women, and Disadvantaged Business Enterprises. The on-line Directory is available to Contractors for their use in identifying and soliciting interest from DBE firms. The database is located under the Firm Certification section of the Diversity Management and Compliance System web page at: https://omwbe.diversitycompliance.com.

Commercially Useful Function (CUF)

49 CFR 26.55(c)(1) defines commercially useful function as: "*A DBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. To perform a commercially useful function, the DBE must also be responsible, with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material, and installing (where applicable) and paying for the material itself. To determine whether a DBE is performing a commercially useful function, you must evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the DBE credit claimed for its performance of the work, and other relevant factors.*"

Contract – For this Special Provision only, this definition supplements Section 1-01.3. 49 CFR 26.5 defines contract as: "… a legally binding relationship obligating a seller to furnish supplies or services (including, but not limited to, construction and professional services) and the buyer to pay for them. For purposes of this part, a lease is considered to be a contract."

Disadvantaged Business Enterprise (DBE) – A business firm certified by the Washington State Office of Minority and Women's Business Enterprises, as meeting the criteria outlined in 49 CFR 26 regarding DBE certification.

Force Account Work – Work measured and paid in accordance with Section 1-09.6.

Manufacturer (DBE) – A DBE firm that operates or maintains a factory or establishment that produces on the premises the materials, supplies, articles, or equipment required under the Contract. A DBE Manufacturer shall produce finished goods or products from raw or unfinished material or purchase and substantially alters goods and materials to make them suitable for construction use before reselling them.

Regular Dealer (DBE) – A DBE firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of a Contract are bought, kept in stock, and regularly sold to the public in the usual course of business. To be a Regular Dealer, the DBE firm must be an established regular business that engages in as its principal business and in its own name the purchase and sale of the products in question. A Regular Dealer in such items as steel, cement, gravel, stone, and petroleum products need not own, operate or maintain a place of business if it both owns and operates distribution equipment for the products. Any supplementing of regular dealers' own distribution equipment shall be by long-term formal lease agreements and not on an ad-hoc basis. Brokers, packagers, manufacturers' representatives, or other persons who arrange or expedite transactions shall not be regarded as Regular Dealers within the meaning of this definition.

DBE Goals

No DBE goals have been assigned as part of this Contract.

Affirmative Efforts to Solicit DBE Participation

The Contractor shall not discriminate on the grounds of race, color, sex, national origin, age, or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. DBE firms shall have an equal opportunity to compete for subcontracts in which the Contractor enters into pursuant to this Contract.

Contractors are encouraged to:

1. Advertise opportunities for Subcontractors or suppliers in a timely and reasonably designed manner to provide notice of the opportunity to DBEs capable of performing the Work. All advertisements should include a Contract Provision encouraging participation by DBE firms. This may be accomplished through general advertisements (e.g. newspapers, journals, etc.) or by soliciting Bids/Proposals directly from DBEs.

2. Establish delivery schedules that encourage participation by DBEs and other small businesses.

3. Participate with a DBE as a joint venture.

DBE Eligibility/Selection of DBEs for Reporting Purposes Only

Contractor may take credit for DBEs utilized on this Contract only if the firm is certified for the Work being performed, and the firm performs a commercially useful function (CUF).

Absent a mandatory goal, all DBE participation that is attained on this project will be considered as “race neutral” participation and shall be reported as such.

Crediting DBE Participation

All DBE Subcontractors shall be certified before the subcontract on which they are participating is executed.

Be advised that although a firm is listed in the directory, there are cases where the listed firm is in a temporary suspension status. The Contractor shall review the OMWBE Suspended DBE Firms list. A DBE firm that is included on this list may not enter into new contracts that count towards participation.

DBE participation is only credited upon payment to the DBE.

The following are some definitions of what may be counted as DBE participation.

DBE Prime Contractor

Only take credit for that portion of the total dollar value of the Contract equal to the distinct, clearly defined portion of the Work that the DBE Prime Contractor performs with its own forces and is certified to perform.

DBE Subcontractor

Only take credit for that portion of the total dollar value of the subcontract equal to the distinct, clearly defined portion of the Work that the DBE performs with its own forces. The value of work performed by the DBE includes the cost of supplies and materials purchased by the DBE and equipment leased by the

DBE, for its work on the contract. Supplies, materials or equipment obtained by a DBE that are not utilized or incorporated in the contract work by the DBE will not be eligible for DBE credit.

The supplies, materials, and equipment purchased or leased from the Contractor or its affiliate, including any Contractor's resources available to DBE subcontractors at no cost, shall not be credited.

DBE credit will not be given in instances where the equipment lease includes the operator. The DBE is expected to operate the equipment used in the performance of its work under the contract with its own forces. Situations where equipment is leased and used by the DBE, but payment is deducted from the Contractor's payment to the DBE is not allowed.

If a DBE subcontracts a portion of the Work of its contract to another firm, the value of the subcontracted Work may be credited only if the DBE's Lower-Tier Subcontractor is also a DBE. Work subcontracted to a non-DBE shall not be credited.

Count expenditures toward race/gender-neutral participation only if the DBE is performing a CUF on the contract.

DBE Subcontract and Lower Tier Subcontract Documents

There must be a subcontract agreement that complies with 49 CFR Part 26 and fully describes the distinct elements of Work committed to be performed by the DBE. The subcontract agreement shall incorporate requirements of the primary Contract. Subcontract agreements of all tiers, including lease agreements shall be readily available at the project site for the Engineer review.

DBE Service Provider

The value of fees or commissions charged by a DBE Broker, a DBE behaving in a manner of a Broker, or another service provider for providing a bona fide service, such as professional, technical, consultant, managerial services, or for providing bonds or insurance specifically required for the performance of the contract will only be credited as DBE participation, if the fee/commission is determined by the Contracting Agency to be reasonable and the firm has performed a CUF.

Temporary Traffic Control

If the DBE firm is being utilized in the capacity of only "Flagging", the DBE firm must provide a Traffic Control Supervisor (TCS) and flagger, which are under the direct control of the DBE. The DBE firm shall also provide all flagging equipment (e.g. paddles, hard hats, and vests).

If the DBE firm is being utilized in the capacity of "Traffic Control Services", the DBE firm must provide a TCS, flaggers, and traffic control items (e.g., cones, barrels, signs, etc.) and be in total control of all items in implementing the traffic control for the project. In addition, if the DBE firm utilizes the Contractor's equipment, such as Transportable Attenuators and Portable Changeable Message Signs (PCMS) no DBE credit can be taken for supplying and operating the items.

Trucking

DBE trucking firm participation may only be credited as DBE participation for the value of the hauling services, not for the materials being hauled unless the trucking firm is also certified as a supplier. In situations where the DBE's work is priced per ton, the value of the hauling service must be calculated separately from the value of the materials in order to determine DBE credit for hauling.

The DBE trucking firm must own and operate at least one licensed, insured and operational truck on the contract. The truck must be of the type that is necessary to perform the hauling duties required under the contract. The DBE receives credit for the value of the transportation services it provides on the Contract using trucks it owns or leases, licenses, insures, and operates with drivers it employs.

The DBE may lease additional trucks from another DBE firm. The Work that a DBE trucking firm performs with trucks it leases from other certified DBE trucking firms qualify for 100% DBE credit

The trucking Work subcontracted to any non-DBE trucking firm will not receive credit for Work done on the project. The DBE may lease trucks from a non-DBE truck leasing company, but can only receive credit as DBE participation if the DBE uses its own employees as drivers.

DBE credit for a truck broker is limited to the fee/commission that the DBE receives for arranging transportation services.

Truck registration and lease agreements shall be readily available at the project site for the Engineer review.

DBE Manufacturer and DBE Regular Dealer

One hundred percent (100%) of the cost of the manufactured product obtained from a DBE Manufacturer can count as DBE participation.

Sixty percent (60%) of the cost of materials or supplies purchased from a DBE Regular Dealer may be credited as DBE participation. If the role of the DBE Regular Dealer is determined to be that of a pass-through, then no DBE credit will be given for its services. If the role of the DBE Regular Dealer is determined to be that of a Broker, then DBE credit shall be limited to the fee or commission it receives for its services. Regular Dealer status and the amount of credit is determined on a Contract-by-Contract basis.

Regular Dealer DBE firms must be approved before being used on a project. The WSDOT Approved Regular Dealer list published on WSDOT's Office of Equal Opportunity (OEO) web site must include the specific project for which approval is being requested. The Regular Dealer must submit the Regular Dealer Status Request form a minimum of five days prior to being utilized on the specific project.

Purchase of materials or supplies from a DBE which is neither a manufacturer nor a regular dealer, (i.e. Broker) only the fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or

transportation charges for the delivery of materials or supplies required on a job site, can count as DBE participation provided the fees are not excessive as compared with fees customarily allowed for similar services. Documentation will be required to support the fee/commission charged by the DBE. The cost of the materials and supplies themselves cannot be counted toward as DBE participation.

Note: Requests to be listed as a Regular Dealer will only be processed if the requesting firm is a material supplier certified by the Office of Minority and Women's Business Enterprises in a NAICS code that falls within the 42XXXX NAICS Wholesale code section.

Procedures Between Award and Execution

After Award and prior to Execution, the Contractor shall provide the additional information described below. Failure to comply shall result in the forfeiture of the Bidder's Proposal bond or deposit.

1. A list of all firms who submitted a bid or quote in attempt to participate in this project whether they were successful or not. Include the business name and mailing address.

   Note: The firms identified by the Contractor may be contacted by the Contracting Agency to solicit general information as follows: age of the firm and average of its gross annual receipts over the past three-years.

Procedures After Execution

Commercially Useful Function (CUF)

The Contractor may only take credit for the payments made for Work performed by a DBE that is determined to be performing a CUF. Payment must be commensurate with the work actually performed by the DBE. This applies to all DBEs performing Work on a project, whether or not the DBEs are COA, if the Contractor wants to receive credit for their participation. The Engineer will conduct CUF reviews to ascertain whether DBEs are performing a CUF. A DBE performs a CUF when it is carrying out its responsibilities of its contract by actually performing, managing, and supervising the Work involved. The DBE must be responsible for negotiating price; determining quality and quantity; ordering the material, installing (where applicable); and paying for the material itself. If a DBE does not perform "all" of these functions on a furnish-and-install contract, it has not performed a CUF and the cost of materials cannot be counted toward DBE COA Goal. Leasing of equipment from a leasing company is allowed. However, leasing/purchasing equipment from the Contractor is not allowed. Lease agreements shall be readily available for review by the Engineer.

In order for a DBE traffic control company to be considered to be performing a CUF, the DBE must be in control of its work inclusive of supervision. The DBE shall employ a Traffic Control Supervisor who is directly involved in the management and supervision of the traffic control employees and services.

The DBE does not perform a CUF if its role is limited to that of an extra participant in a transaction, contract, or project through which the funds are passed in order to obtain the appearance of DBE participation.

The following are some of the factors that the Engineer will use in determining whether a DBE trucking company is performing a CUF:

- The DBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on the Contract. The owner demonstrates business related knowledge, shows up on site and is determined to be actively running the business.

- The DBE shall with its own workforce, operate at least one fully licensed, insured, and operational truck used on the Contract. The drivers of the trucks owned and leased by the DBE must be exclusively employed by the DBE and reflected on the DBE's payroll.

- Lease agreements for trucks shall indicate that the DBE has exclusive use of and control over the truck(s). This does not preclude the leased truck from working for others provided it is with the consent of the DBE and the lease provides the DBE absolute priority for use of the leased truck.

- Leased trucks shall display the name and identification number of the DBE.

Joint Checking

A joint check is a check between a Subcontractor and the Contractor to the supplier of materials/supplies. The check is issued by the Contractor as payer to the Subcontractor and the material supplier jointly for items to be incorporated into the project. The DBE must release the check to the supplier, while the Contractor acts solely as the guarantor.

A joint check agreement must be approved by the Engineer and requested by the DBE involved using the DBE Joint Check Request Form (form # 272-053) prior to its use. The form must accompany the DBE Joint Check Agreement between the parties involved, including the conditions of the arrangement and expected use of the joint checks.

The approval to use joint checks and the use will be closely monitored by the Engineer. To receive DBE credit for performing a CUF with respect to obtaining materials and supplies, a DBE must "be responsible for negotiating price, determining quality and quantity, ordering the material and installing and paying for the material itself." The Contractor shall submit DBE Joint Check Request Form for the Engineer approval prior to using a joint check.

Material costs paid by the Contractor directly to the material supplier is not allowed. If proper procedures are not followed or the Engineer determines that the arrangement results in lack of independence for the DBE involved, no DBE credit will be given for the DBE's participation as it relates to the material cost.

Prompt Payment

Prompt payment to all subcontractors shall be in accordance with Section 1-08.1. Prompt Payment requirements apply to progress payments as well as return of retainage.

Reporting
The Contractor and all subcontractors/suppliers/service providers that utilize DBEs to perform work on the project, shall maintain appropriate records that will enable the Engineer to verify DBE participation throughout the life of the project.

Refer to Section 1-08.1 for additional reporting requirements associated with this Contract.

Decertification
When a DBE is "decertified" from the DBE program during the course of the Contract, the participation of that DBE shall continue to count as DBE participation as long as the subcontract with the DBE was executed prior to the decertification notice. The Contractor is obligated to substitute when a DBE does not have an executed subcontract agreement at the time of decertification.

Consequences of Non-Compliance
Each contract with a Contractor (and each subcontract the Contractor signs with a Subcontractor) must include the following assurance clause:

The Contractor, subrecipient, or Subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

(1) Withholding monthly progress payments;

(2) Assessing sanctions;

(3) Liquidated damages; and/or

(4) Disqualifying the Contractor from future bidding as non-responsible.

Payment
Compensation for all costs involved with complying with the conditions of this Specification and any other associated DBE requirements is included in payment for the associated Contract items of Work, except otherwise provided in the Specifications.

Utilities and Similar Facilities
(July 26, 2024 SkagitR)

Section 1-07.17 is supplemented with the following:

(*****)
A fire Hydrant is located on S. March Point Road at the landfill entrance. Obtain permit and coordinate with the City of Anacortes to use it for the necessary water supply for the project, e.g., dust control.

The sewer line has been capped on site. Coordinate and obtain approval/permit from the City of Anacortes to install a connection at the project boundary for discharge of treated groundwater.

The power to the site was disconnected by Puget Sound Energy in 2022, by removing the 3-phase transformer and disconnection of the lines at the power pole outside the landfill entrance. Former electric cables may still remain on site.

Confirm all previous utilities to the site have been disconnected. An exception may be the fire line servicing a hydrant near the former mill. Examine the connection in the water vault outside the gate and if active, coordinate with the City of Anacortes Fire Department to disconnect.

Obtain the necessary permit from the City of Anacortes and activate the potable water supply service to the site when the irrigation system is being installed.

All exiting on site utilities shall be disconnected as close to the property line as possible and abandoned in place.

Excavating near Existing Utilities

Hand-excavate to locate utilities when excavating within 24 inches of marked underground facilities. Inspect the water vault at the site entrance to determine the status of the potable water supply and fire lines. All utilities to the site should be disconnected.

All work associated with the existing utilities are included in 2-02 “Removal of Structures and shall be paid by lump sum.

(April 2, 2007)

Locations and dimensions shown in the Plans for existing facilities are in accordance with available information obtained without uncovering, measuring, or other verification.

The following addresses and telephone numbers of utility companies known or suspected of having facilities within the project limits are supplied for the Contractor's convenience:

*** Puget Sound Energy
Puget Sound Construction Services
1-888-321-7779

City of Anacortes Public Works Department
360-588-8330***

1-07.18 Public Liability and Property Damage Insurance

1-07.18(5) Required Insurance Policies

Section 1-07.18(5) is supplemented with the following:

1-07.18(5)D Excess or Umbrella Liability
(*November 1, 2024 SkagitR*)

The Contractor shall provide Excess or Umbrella Liability insurance with limits of not less than $5 million each occurrence and $10 million annual aggregate. This excess or umbrella liability coverage shall be excess over and at least as broad in coverage as the Contractor’s Commercial General and Auto Liability insurance

All entities listed under 1-07.18(2) of these Special Provisions shall be named as additional insureds on the Contractor's Excess or Umbrella Liability insurance policy. Proof of insurance shall be in a form acceptable and approved by the County. Skagit County shall be listed as Certificate Holder and Skagit County, its elected officials, officers, and employees named as additional insured.

This requirement may be satisfied instead through the Contractor's primary Commercial General and Automobile Liability coverages, or any combination thereof that achieves the overall required limits of insurance.

1-07.18(5)E LHWCA Insurance
(January 4, 2016 APWA GSP)

If this Contract involves work on or adjacent to Navigable Waters of the United States, the Contractor shall procure and maintain insurance coverage in compliance with the statutory requirements of the U.S. Longshore and Harbor Workers' Compensation Act (LHWCA).

Such policy must provide the following minimum limits:
$1,000,000 Bodily Injury by Accident – each accident
$1,000,000 Bodily Injury by Disease – each employee
$1,000,000 Bodily Injury by Disease – policy limits

1-07.18(5)F Protection & Indemnity Insurance Including Jones Act
(January 4, 2016 APWA GSP)

If this Contract involves marine activities, or work from a boat, vessel, or floating platform, the Contractor shall procure and maintain Protection and Indemnity (P&I) coverage including collision liability, injury to crew (Merchant Marine Act of 1920 - Jones Act) and passengers, removal of wreck and liability for seepage, pollution, containment and cleanup using form SP-23 or SP 38 or a form as least as broad.

All entities listed under 1-07.18(2) of these Special Provisions shall be named as additional insureds on the Contractor's Protection and Indemnity insurance policy.

Such policy must provide the following minimum limits:
$1,000,000 Bodily Injury by Accident – each accident or occurrence
$1,000,000 Bodily Injury by Disease – each employee
$1,000,000 Bodily Injury by Disease – policy limits

1-07.18(5)G Hull and Machinery
(January 4, 2016 APWA GSP)

If this Contract involves use of a boat, vessel, or floating platform, the Contractor shall procure and maintain coverage at Market Value of vessel on American Institute Hull Clauses, 6/2/77 form.

1-07.18(5)H Marine Pollution
(January 4, 2016 APWA GSP)

The Contractor shall procure and maintain Pollution Liability (OPA, CERCLA) insurance to satisfy U.S. Coast Guard requirements as respects the Federal Oil Pollution Act of 1990

and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended.

Such policy must provide the following minimum limits, or statutory limits of liability as applicable, whichever is higher:
$1,000,000 per Occurrence

1-07.18(5)IBuilder's Risk
(*November 1, 2024 SkagitR*)

Contractor shall purchase and maintain Builder's Risk insurance covering interests of the Contracting Agency, the Contractor, and subcontractors of every tier, as Named Insureds, in the Work. Proof of insurance shall be in a form acceptable and approved by the County. Skagit County shall be listed as Certificate Holder and Skagit County, its elected officials, officers, and employees named as additional insured. An Installation Floater instead of Builders Risk is acceptable for renovation projects. Builder's Risk insurance shall be on a special form policy, and shall insure against the perils of fire and extended coverage and physical loss or damage, theft, vandalism, malicious mischief and collapse; and flood and earthquake when shown below. The Builder's Risk insurance shall include coverage for temporary buildings, debris removal, and damage to materials in transit or stored off-site. Such insurance shall cover resulting "soft costs" including but not limited to design costs, licensing fees, architect's and engineer's fees, and costs due to delay in completion.

Builder's Risk insurance shall be written in the amount of the completed value of the project, with no coinsurance provisions. All limits shall meet or exceed those as outlines in Aquatic Lands Sediment Remediation Temporary Easement. Such policy must provide coverage and deductibles that comply with the following:

Coverage:

Total Cost of Project to be Insured: $14,189,345.00
Soft Costs: $1,267,900.00
Flood: $5M
Earthquake: $5M

Deductibles not to exceed:

Flood: 2% of the Value at Time of Loss, subject to a $250,000 Minimum
Earthquake: 5% of the Value at Time of Loss, subject to a $250,000 Minimum
Earth Movement: 5% of the Value at Time of Loss, subject to a $250,000 Minimum
All Other Perils: $50,000
Soft Costs: $50,000, with no more than 7-day waiting period

The Builders Risk insurance covering the work shall have maximum deductibles as listed above for each occurrence. The deductible(s) shall be the responsibility of the Contractor.

The Contractor shall provide the Contracting Agency with a full and certified copy of the insurance policy when the Contractor delivers the signed Contract for the work. Failure of Contracting Agency to demand such verification of coverage with these insurance requirements or failure of Contracting Agency to identify a deficiency from the insurance documentation provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

The Builders Risk insurance shall be maintained until final acceptance of the Work by the Contracting Agency.

The Contractor and the Contracting Agency waive all rights against each other and any of their subcontractors of every tier, agents, and employees, officers, and officials, for damages caused by fire or other perils to the extent covered by Builder's Risk insurance or other property insurance applicable to the work. The policies shall provide such waivers by endorsement.

1-07.18(5)J Pollution Liability
(*November 1, 2024 SkagitR*)

The Contractor shall provide a Contractors Pollution Liability policy, providing coverage for claims involving bodily injury, property damage (including loss of use of tangible property that has not been physically injured), cleanup costs, remediation, disposal or other handling of pollutants, including costs and expenses incurred in the investigation, defense, or settlement of claims, arising out of any one or more of the following:

1. Contractor's operations related to this project.
2. Remediation, abatement, repair, maintenance or other work with lead-based paint or materials containing asbestos.
3. Transportation of hazardous materials away from any site related to this project.

All entities listed under 1-07.18(2) of these Special Provisions shall be named by endorsement as additional insureds on the Contractors Pollution Liability insurance policy.

Such Pollution Liability policy shall provide the following minimum limits:
$5 million each loss and annual aggregate

The contractor shall provide workers compensation coverage as required by law, with Employer's Liability coverage in the amount of at least $500,000 each accident, $500,000 by disease policy limit, $500K by disease each employee.

The contractor shall provide a Railroad Protective Liability insurance policy with coverage of at least $5 million per occurrence and $10 million aggregate.

Contractor's insurance policies must meet requirements listed in Exhibit "C" Contractor's Right of Entry Agreement.

Contractor's insurance shall be primary. Any insurance or self-insurance maintained by the County, its officers, employees or volunteers shall be excess of Contractor's insurance and shall not contribute to it.

1-07.28 Railroads
(July 26, 2024 SkagitR)

Section 1-07.28 is supplemented with the following:

(*****)
Portions of the work on the north side are within BNSF right of way. The line is active, servicing the nearby refinery. There is usually one trip during the daytime and one at night

time at low speeds. BNSF operations are not expected to interfere with the Contractor's operations.

Appropriate railroad safety training will be required for workers within that zone when temporary fencing is not in place. Contracting Agency will arrange and pay for a flagger, or other costs from BNSF; Contractor is responsible for the BNSF-required safety and background screening training. See the following links: www.BNSFContractor.com. www.everifile.com

Contractor is responsible to notify the Engineer at least 10 days prior to working within BNSF right-of-way, when there is no fencing separating the work area, to allow the Engineer to arrange for BNSF flagger.

The Contractor shall be responsible for compliance with all contractor conditions described in Exhibit C of the "License for Environmental Access", included in this bid package.

1-08 PROSECUTION AND PROGRESS

Add the following new section:

1-08.0 Preliminary Matters

(May 25, 2006 APWA GSP)

Add the following new section:

1-08.0(1) Preconstruction Conference

(July 8, 2024 APWA GSP)

Prior to the Contractor beginning the work, a preconstruction conference will be held between the Contractor, the Engineer and such other interested parties as may be invited. The purpose of the preconstruction conference will be:

1. To review the initial progress schedule;
2. To establish a working understanding among the various parties associated or affected by the work;
3. To establish and review procedures for progress payment, notifications, approvals, submittals, etc.;
4. To review DBE Requirements, Training Plans, and Apprenticeship Plans, when applicable.
5. To establish normal working hours for the work;
6. To review safety standards and traffic control; and
7. To discuss such other related items as may be pertinent to the work.

The Contractor shall prepare and submit at the preconstruction conference the following:

1. A breakdown of all lump sum items;
2. A preliminary schedule of working drawing submittals; and
3. A list of material sources for approval if applicable.

Add the following new section:

1-08.0(2) Hours of Work
(July 26, 2024 SkagitR)

Contractor may work the necessary hours to coordinate with the tides, where applicable, and to complete the work. Inform the Engineer of the hours of operation in advance. When working outside of hours of 7 am and 10 pm, apply noise control measures, if needed, to prevent noise levels greater than 70 dB from reaching nearby properties.

1-08.1 Subcontracting
(December 30, 2022 APWA GSP, Option A)

Section 1-08.1 is supplemented with the following:

Prior to any subcontractor or lower tier subcontractor beginning work, the Contractor shall submit to the Engineer a certification (WSDOT Form 420-004) that a written agreement between the Contractor and the subcontractor or between the subcontractor and any lower tier subcontractor has been executed. This certification shall also guarantee that these subcontract agreements include all the documents required by the Special Provision Federal Agency Inspection.

A subcontractor or lower tier subcontractor will not be permitted to perform any work under the contract until the following documents have been completed and submitted to the Engineer:

1. Request to Sublet Work (WSDOT Form 421-012), and

2. Contractor and Subcontractor or Lower Tier Subcontractor Certification for Federal-aid Projects (WSDOT Form 420-004).

The Contractor shall submit to the Engineer a completed Monthly Retainage Report (WSDOT Form 272-065) within 15 calendar days after receipt of every monthly progress payment until every subcontractor and lower tier subcontractor’s retainage has been released.

The Contractor's records pertaining to the requirements of this Special Provision shall be open to inspection or audit by representatives of the Contracting Agency during the life of the contract and for a period of not less than three years after the date of acceptance of the contract. The Contractor shall retain these records for that period. The Contractor shall also guarantee that these records of all subcontractors and lower tier subcontractors shall be available and open to similar inspection or audit for the same time period.

Progress Schedule

1-08.3(2)B Type B Progress Schedule
(January 4, 2024 APWA GSP)

Revise the first paragraph to read:

The Contractor shall submit a preliminary Type B Progress Schedule at or prior to the preconstruction conference. The preliminary Type B Progress Schedule shall comply with all of these requirements and the requirements of Section 1-08.3(2), except that it may be limited to only those activities occurring within the first 60-working days of the project.

Revise the first sentence of the second paragraph to read:

The Contractor shall submit three (3) copies of a Type B Progress Schedule depicting the entire project no later than 21-calendar days after the preconstruction conference.

1-08.4 Prosecution of Work

Delete this section and replace it with the following:

1-08.4 Notice to Proceed and Prosecution of Work
(July 23, 2015 APWA GSP)

Notice to Proceed will be given after the contract has been executed and the contract bond and evidence of insurance have been approved and filed by the Contracting Agency. The Contractor shall not commence with the work until the Notice to Proceed has been given by the Engineer. The Contractor shall commence construction activities on the project site within ten days of the Notice to Proceed Date, unless otherwise approved in writing. The Contractor shall diligently pursue the work to the physical completion date within the time specified in the contract. Voluntary shutdown or slowing of operations by the Contractor shall not relieve the Contractor of the responsibility to complete the work within the time(s) specified in the contract.

When shown in the Plans, the first order of work shall be the installation of high visibility fencing to delineate all areas for protection or restoration, as described in the Contract. Installation of high visibility fencing adjacent to the roadway shall occur after the placement of all necessary signs and traffic control devices in accordance with 1-10.1(2). Upon construction of the fencing, the Contractor shall request the Engineer to inspect the fence. No other work shall be performed on the site until the Contracting Agency has accepted the installation of high visibility fencing, as described in the Contract.

Time for Completion
(July 26, 2024 SkagitR)

Section 1-08.5 is supplemented with the following:

Contractor shall mobilize to the site starting on March 31, 2025 and complete the project by October 31, 2025, and complete demobilization.

1-08.5 Time for Completion
(December 30, 2022 APWA GSP, Option A)

Revise the sixth paragraph to read:

The Engineer will give the Contractor written notice of the completion date of the contract after all the Contractor's obligations under the contract have been performed by the Contractor. The following events must occur before the Completion Date can be established:

1. The physical work on the project must be complete; and
2. The Contractor must furnish all documentation required by the contract and required by law, to allow the Contracting Agency to process final acceptance of the contract. The following documents must be received by the Project Engineer prior to establishing a completion date:
    a. Certified Payrolls (per Section 1-07.9(5)).
    b. Material Acceptance Certification Documents
    c. Monthly Reports of Amounts Credited as DBE Participation, as required by the Contract Provisions.
    d. Final Contract Voucher Certification
    e. Copies of the approved "Affidavit of Prevailing Wages Paid" for the Contractor and all Subcontractors
    f. A copy of the Notice of Termination sent to the Washington State Department of Ecology (Ecology); the elapse of 30 calendar days from the date of receipt of the Notice of Termination by Ecology; and no rejection of the Notice of Termination by Ecology. This requirement will not apply if the Construction Stormwater General Permit is transferred back to the Contracting Agency in accordance with Section 8-01.3(16).
    g. Property owner releases per Section 1-07.24

Suspension of Work

(July 26, 2024 SkagitR)

Supplement the first paragraph of Section 1-08.6 with the following:

4. It is required for compliance with environmental and permit regulations or conditions, such as those outlined in the Heron Management Plan.

Section 1-08.6 is supplemented with the following:

Contract time may be suspended for procurement of critical materials (Procurement Suspension). In order to receive a Procurement Suspension, the Contractor shall within 21 calendar days after execution by the Contracting Agency, place purchase orders for all materials deemed critical by the Contracting Agency for physical completion of the contract. The Contractor shall provide copies of purchase orders for the critical materials. Such purchase orders shall disclose the purchase order date and estimated delivery dates for such critical material.

The Contractor shall show procurement of the materials listed below as activities in the Progress Schedule. If the approved Progress Schedule indicates that the materials procurement are critical activities, and if the Contractor has provided documentation that purchase orders are placed for the critical materials within the prescribed 21 calendar days, then contract time will be suspended upon physical completion of all critical work except that work dependent upon the below listed critical materials:

*** $$ Temporary erosion control measures, GCLL and GCLL Enhanced $$ ***

Charging of contract time will resume upon delivery of the critical materials to the Contractor.

1-08.9 Liquidated Damages

(March 3, 2021 APWA GSP, Option B)

Revise the second and third paragraphs to read:

Accordingly, the Contractor agrees:

1. To pay (according to the following formula) liquidated damages for each working day beyond the number of working days established for Physical Completion, and

2. To authorize the Engineer to deduct these liquidated damages from any money due or coming due to the Contractor.

Liquidated Damages Formula

LD=0.15C/T

Where:

LD = liquidated damages per working day (rounded to the nearest dollar)
C = original Contract amount
T = original time for Physical Completion

When the Contract Work has progressed to Substantial Completion as defined in the Contract, the Engineer may determine the Contract Work is Substantially Complete. The Engineer will notify the Contractor in writing of the Substantial Completion Date. For overruns in Contract time occurring after the date so established, the formula for liquidated damages shown above will not apply. For overruns in Contract time occurring after the Substantial Completion Date, liquidated damages shall be assessed on the basis of direct engineering and related costs assignable to the project until the actual Physical Completion Date of all the Contract Work. The Contractor shall complete the remaining Work as promptly as possible. Upon request by the Project Engineer, the Contractor shall furnish a written schedule for completing the physical Work on the Contract.

1-09 Measurement and Payment

1-09.2(5) Measurement

(December 30, 2022 APWA GSP)

Revise the first paragraph to read:

Scale Verification Checks – At the Engineer's discretion, the Engineer may perform verification checks on the accuracy of each batch, hopper, or platform scale used in weighing contract items of Work.

1-09.6 Force Account

(December 30, 2022 APWA GSP)

Supplement this section with the following:

The Contracting Agency has estimated and included in the Proposal, dollar amounts for all items to be paid per force account, only to provide a common proposal for Bidders. All such dollar amounts are to become a part of Contractor's total bid. However, the Contracting Agency does not warrant expressly or by implication, that the actual amount of work will correspond with those estimates. Payment will be made on the basis of the amount of work actually authorized by the Engineer.

Payment For Material On Hand

The last paragraph of Section 1-09.8 is revised to read:

(August 3, 2009)
The Contracting Agency will not pay for material on hand when the invoice cost is less than $2,000. As materials are used in the work, credits equaling the partial payments for them will be taken on future estimates. Each month, no later than the estimate due date, the Contractor shall submit a letter to the Engineer that clearly states: 1) the amount originally paid on the invoice (or other record of production cost) for the items on hand, 2) the dollar amount of the material incorporated into each of the various work items for the month, and 3) the amount that should be retained in material on hand items. If work is performed on the items and the Contractor does not submit a letter, all of the previous material on hand payment will be deducted on the estimate. Partial payment for materials on hand shall not constitute acceptance. Any material will be rejected if found to be faulty even if partial payment for it has been made.

1-09.9 Payments

(December 30, 2022 APWA GSP)

Section 1-09.9 is revised to read:

The basis of payment will be the actual quantities of Work performed according to the Contract and as specified for payment.

The Contractor shall submit a breakdown of the cost of lump sum bid items at the Preconstruction Conference, to enable the Project Engineer to determine the Work performed on a monthly basis. A breakdown is not required for lump sum items that include a basis for incremental payments as part of the respective Specification. Absent a lump sum breakdown, the Project Engineer will make a determination based on information available. The Project Engineer’s determination of the cost of work shall be final.

Progress payments for completed work and material on hand will be based upon progress estimates prepared by the Engineer. A progress estimate cutoff date will be established at the preconstruction conference.

The initial progress estimate will be made not later than 30 days after the Contractor commences the work, and successive progress estimates will be made every month thereafter until the Completion Date. Progress estimates made during progress of the work are tentative, and made only for the purpose of determining progress payments. The progress estimates are subject to change at any time prior to the calculation of the final payment.

The value of the progress estimate will be the sum of the following:

1. Unit Price Items in the Bid Form — the approximate quantity of acceptable units of work completed multiplied by the unit price.
2. Lump Sum Items in the Bid Form — based on the approved Contractor's lump sum breakdown for that item, or absent such a breakdown, based on the Engineer's determination.
3. Materials on Hand — 100 percent of invoiced cost of material delivered to Job site or other storage area approved by the Engineer.
4. Change Orders — entitlement for approved extra cost or completed extra work as determined by the Engineer.

Progress payments will be made in accordance with the progress estimate less:

1. Retainage per Section 1-09.9(1), on non FHWA-funded projects;
2. The amount of progress payments previously made; and
3. Funds withheld by the Contracting Agency for disbursement in accordance with the Contract Documents.

Progress payments for work performed shall not be evidence of acceptable performance or an admission by the Contracting Agency that any work has been satisfactorily completed. The determination of payments under the contract will be final in accordance with Section 1-05.1.

Failure to perform obligations under the Contract by the Contractor may be decreed by the Contracting Agency to be adequate reason for withholding any payments until compliance is achieved.

Upon completion of all Work and after final inspection (Section 1-05.11), the amount due the Contractor under the Contract will be paid based upon the final estimate made by the Engineer and presentation of a Final Contract Voucher Certification to be signed by the Contractor. The Contractor's signature on such voucher shall be deemed a release of all claims of the Contractor unless a Certified Claim is filed in accordance with the requirements of Section 1-09.11 and is expressly excepted from the Contractor's certification on the Final Contract Voucher Certification. The date the Contracting Agency signs the Final Contract Voucher Certification constitutes the final acceptance date (Section 1-05.12).

If the Contractor fails, refuses, or is unable to sign and return the Final Contract Voucher Certification or any other documentation required for completion and final acceptance of the Contract, the Contracting Agency reserves the right to establish a Completion Date (for the purpose of meeting the requirements of RCW 60.28) and unilaterally accept the Contract. Unilateral final acceptance will occur only after the Contractor has been provided the opportunity, by written request from the Engineer, to voluntarily submit such documents. If voluntary compliance is not achieved, formal notification of the impending establishment of a Completion Date and unilateral final acceptance will be provided by email with delivery confirmation from the Contracting Agency to the Contractor, which will provide 30 calendar days for the Contractor to submit the necessary documents. The 30 calendar day period will begin on the date the email with delivery confirmation is received by the Contractor. The date the Contracting Agency unilaterally signs the Final

Contract Voucher Certification shall constitute the Completion Date and the final acceptance date (Section 1-05.12). The reservation by the Contracting Agency to unilaterally accept the Contract will apply to Contracts that are Physically Completed in accordance with Section 1-08.5, or for Contracts that are terminated in accordance with Section 1-08.10. Unilateral final acceptance of the Contract by the Contracting Agency does not in any way relieve the Contractor of their responsibility to comply with all Federal, State, tribal, or local laws, ordinances, and regulations that affect the Work under the Contract.

Payment to the Contractor of partial estimates, final estimates, and retained percentages shall be subject to controlling laws.

1-09.9 Payments

(March 13, 2012 APWA GSP)

Supplement this section with the following:

Lump sum item breakdowns are not required when the bid price for the lump sum item is less than $20,000.

Retainage

Section 1-09.9(1) content and title is deleted and replaced with the following:

(June 27, 2011)
Vacant

1-09.11(3) Time Limitation and Jurisdiction

(December 30, 2022 APWA GSP)

Revise this section to read*:*

For the convenience of the parties to the Contract it is mutually agreed by the parties that all claims or causes of action which the Contractor has against the Contracting Agency arising from the Contract shall be brought within 180 calendar days from the date of final acceptance (Section 1-05.12) of the Contract by the Contracting Agency; and it is further agreed that all such claims or causes of action shall be brought only in the Superior Court of the county where the Contracting Agency headquarters is located, provided that where an action is asserted against a county, RCW 36.01.050 shall control venue and jurisdiction. The parties understand and agree that the Contractor's failure to bring suit within the time period provided, shall be a complete bar to all such claims or causes of action. It is further mutually agreed by the parties that when claims or causes of action which the Contractor asserts against the Contracting Agency arising from the Contract are filed with the Contracting Agency or initiated in court, the Contractor shall permit the Contracting Agency to have timely access to all records deemed necessary by the Contracting Agency to assist in evaluating the claims or action.

Division 2
EARTHWORK

2-02 Removal of Structures and Obstructions

2-02.3 Construction Requirements

Section 2-02.3 is supplemented with the following:

(*****)
The following listed items shall be removed and disposed of below the landfill cap, within project site in accordance with the requirements of the Specifications, unless otherwise stated. Quantities are approximate and are listed to assist in the bidding process only and should not be considered exact. Contractor shall be solely responsible for determining the exact quantities for all work items and quantities requiring removal and disposal prior to submitting bid.

ITEM	LOCATION	APPROXIMATE QUANTITY
Existing Fence	At the entrance	160 LF
Grubbing Debris	Across the site	200 CY
Stockpiled Debris	Western area	120 CY
Investigative Waste Drums	Delivered to the site	21 EACH
Concrete Rebar Cutting	Western area of landfill	2 DAYS
Abandon Utilities	At the entrance	3 DAYS

1. Remove the existing fence and gate and incorporate into the landfill.

2. Grubbing debris includes removal existing tree trunks remaining from a previous tree cutting.

3. Incorporate two existing stockpiles on site into the landfill. One stockpile is debris from demolition of mainly wooden structures and the other is remnants from previously cut trees and vegetation.

4. Contracting Agency will deliver 21 drums containing previous investigative waste containing drill cuttings and purge water collected. Empty the soil drum on site and incorporate into the landfill. Process the water through the treatment system. Crush the drums flat and incorporate into the landfill.

5. Concrete Material that is to be incorporated into the landfill has been broken into pieces not exceeding 24 inches in any dimension, the Contractor is responsible for cutting the rebar as needed to remove the concrete where needed. No part of any piece shall be within 3 feet of the final top of waste surface.

6. Utilities shown on the Plans are expected to have been disconnected or deactivated. A transformer on site was removed and power was disconnected by Puget Sound Energy in 2022. Conduits may contain the remnant wiring. Verify

utilities are disconnected and cut and cap as close to the property line as possible. Abandon the lines on site in place. Exception is the sewer line; obtain approval/permit from the City of Anacortes to cut into the sewer and install a check valve, or as approved by the City, for discharge of treated water.

2-12 Construction Geosynthetic

2-12.1 Description

Section 2-12.1 is supplemented with the following:

(*****)

2-12.1(1) Geosynthetic Clay Liner with Lamination (GCLL)

The Contractor shall furnish and place geosynthetic clay liner with lamination (GCLL) as shown in the Plans and described herein.

The low permeability layer of the cap shall be geosynthetic clay liner with lamination (GCLL) manufactured by CETCO®. There are two types of GCLL:

The portion below elevation 16 mean lower low water (MLLW) datum that can be exposed to saline environment shall be CETCO's GCLL, Enhanced, Resistex Plus CL®, no substitution.

The portion above elevation 16 MLLW shall be CETCO's Bentomat CL ®, no substitution.

The exception is the layer of GCLL to be placed over the railroad embankment, it shall be entirely of Bentomat CL ®. The approximate boundary of the two types, GCLL and GCLL Enhanced, is shown on the Plans.

2-12.2 Materials

Section 2-12.2 is supplemented with the following:

(*****)

Construction Geotextile for Permanent Erosion Control	9-33 Tables 4 & 5, (Class C)
Backfill for Sand Drains	9-03.13

Geosynthetic roll identification, storage, and handling shall be the responsibility of the Contractor. It is recommended that a dedicated storage area shall be selected at the job site that is away from high traffic areas and is level, dry and well drained.

All stored GCLL materials and the accessory bentonite must be covered with a plastic sheet or tarpaulin until their installation in a manner that provides full protection from ultraviolet radiation including sunlight, site construction damage, precipitation, chemicals that are strong acids or strong bases, flames including welding sparks, temperatures in excess of 160ºF, and any other environmental condition that may damage the physical property values of the geosynthetic. GCLL rolls shall be stockpiled in a manner that prevents sliding or rolling from the stacks and may be accomplished by the use of chock blocks. GCLL should be stacked at a height no higher than that at which the lifting

apparatus can be safely handled (typically no higher than four tiers). All stored GCLL materials and the accessory bentonite must be covered with a plastic sheet or tarpaulin until their installation. The integrity and legibility of the labels shall be preserved during storage.

For all Geosynthetic other than the GCLL, the geotextile shall meet the properties of "Class C" shown in Section 9-33 in Tables 4 "Geotextile for Permanent Erosion Control and Ditch Lining" and 5 "Filtration Properties for Geotextile for Permanent Erosion Control".

2-12.3 Construction Requirements

Section 2-12.3 is supplemented with the following:

(*****)

2-12.3(1) Earthwork Requirements for GCLL

Any earthen surface upon which the GCLL is installed shall be prepared and compacted. The surface shall be smooth, firm, and unyielding, and free of: Vegetation; Construction Debris; Sticks; Sharp rocks; Void spaces; Ice; Abrupt elevation changes; Standing water; Cracks larger than one-quarter inch in width; Any other foreign matter that could contact the GCLL.

Immediately prior to GCLL installation, the subgrade shall be fine-graded to fill in all voids or cracks and leave a smooth surface. At completion of this activity, no wheel ruts, footprints or other irregularities shall exist in the subgrade. Furthermore, all protrusions extending more than one-half inch from the surface shall either be removed, crushed or pushed into the surface. The Engineer will approve the prepared subgrade prior to GCLL installation. Contractor is responsible thereafter to inform the Engineer of any change in the condition of the subgrade that could cause the subgrade to be out of compliance with any of the requirements listed in this Section.

2-12.3(2) Placement Requirements for GCLL

GCLL rolls should be delivered to the working area of the site in their original packaging. Immediately prior to deployment, the packaging should be carefully removed without damaging the GCLL. The GCLL shall be installed with the lamination facing up.

Equipment, which could damage the GCLL, shall not be allowed to travel directly on it. If the installation equipment causes rutting of the subgrade, the subgrade must be restored to its originally accepted condition before placement continues.

Care must be taken to minimize the extent to which the GCLL is dragged across the subgrade in order to avoid damage to the bottom surface of the GCLL. A temporary geosynthetic subgrade covering commonly known as a slip sheet or rub sheet may be used to reduce friction damage during placement.

The GCLL panels shall be placed parallel to the direction of the slope.

All GCLL panels should lie flat on the underlying surface, with no wrinkles or fold, especially at the exposed edges of the panels.

Place only as much GCLL as can be covered at the end of the working day with Backfill for Sand Drainage layer. This is particularly important along the shoreline where the GCLL may be exposed to surface water. The GCLL shall not be left uncovered overnight. If the GCLL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. The Engineer and GCLL supplier should be consulted for specific guidance if premature hydration occurs.

2-12.3(3) Anchorage Requirements for GCLL

An anchor trench shall be excavated at least 6 inches deep and 12 inches wide and approved by the Engineer prior to GCLL placement. No loose soil shall be allowed at the bottom of the trench and no sharp corners or protrusions shall exist anywhere within the trench.

2-12.3(4) Seaming, Detail, and Repair Requirements for GCLL

The GCLL seams are constructed by overlapping their adjacent edges. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. Bentonite-enhanced seams are required for installation of membrane-laminated GCLLs.

The minimum dimension of the longitudinal overlap should be 12 inches). End-of-roll overlapped seams should be similarly constructed, but the minimum overlap should measure 24 inches.

Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade to prevent the potential for runoff flow to enter the overlap zone.

Bentonite-enhanced seams are constructed between the overlapping adjacent panels described above. The underlying edge of the longitudinal overlap is exposed and then a continuous bead of granular sodium bentonite, provided by the supplier, is applied within the zone defined by the edge of the underlying panel and the 12-inch line. A similar bead of granular sodium bentonite is applied at the end-of-roll overlap. The granular bentonite shall be applied at a minimum application rate of one quarter pound per lineal foot.

GCLL shall be sealed around penetrations and embedded structures embedded in accordance with the GCLL Manufacturer. Cutting the GCLL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid damage to the geotextile components during the cutting process.

Should the GCLL be torn, punctured, or the overlaps or sewn joints disturbed, as evidenced by visible geosynthetic damage, Subgrade pumping, intrusion, or Roadbed distortion, the backfill around the damaged or displaced area shall be removed and the damaged area repaired or replaced by the Contractor at no expense to the Contracting Agency. The repair shall consist of a patch of the same type of GCLL placed over the damaged area. The patch shall be obtained from a new GCLL roll and shall be cut to size such that a minimum overlap of 12 inches is achieved around all of the damaged area. Granular bentonite or bentonite mastic should be

applied around the damaged area prior to placement of the patch. It may be desirable to use an adhesive to affix the patch in place so that it is not displaced during cover placement.

2-12.3(5) Cover Placement for GCLL

Backfill for Sand Drainage layer placed over the GCLL shall be free of angular stones or other foreign matter that could damage the GCLL.

Backfill shall be placed over the GCLL using construction equipment that minimizes stresses on the GCLL. A minimum thickness of 6 inches of cover should be maintained between the equipment tires/tracks and the GCLL at all times during the covering process. This thickness recommendation does not apply to frequently trafficked areas or roadways, for which a minimum thickness of 2 feet is required.

Although direct vehicular contact with the GCLL is to be avoided, lightweight, low ground pressure vehicles (such as 4-wheel all-terrain vehicles) may be used to facilitate the installation of any geosynthetic material placed over the GCLL. The GCLL supplier should be contacted with specific recommendations on the appropriate procedures in this situation.

Backfill for Sand Drains layer shall be installed in one pass with a low contact pressure dozer, such as D3 with contact pressure of less than 5 psi. Placement shall be in a manner that prevents the soil from entering the GCLL overlap zones. Backfill for sand Drainage layer on the slopes shall be placed parallel to the slope be pushed up slopes, not down slopes, to minimize tensile forces on the GCLL. Track-compact the layer with minimum of three passes by the dozer, or as directed by the Engineer. Avoid sudden stops, starts, and sharp turns.

2-12.4 Measurement

Section 2-12.4 is supplemented with the following:

(*****)
Geosynthetic Clay Liner with Lamination (GCLL) will be measured by the square yard for the ground surface area completed, does not include duplication for the overlaps, which are incidental.

Geosynthetic Clay Liner with Lamination (GCLL) Enhanced will be measured by the square yard for the ground surface area completed, does not include duplications for the overlap, which are incidental.

Construction Geotextile for Permanent Erosion Control will be measured by the square yard for the surface area covered, does not include duplications for the overlaps, which are incidental.

Backfill for Sand Drains will be measured by the ton.

2-12.5 Payment

Section 2-12.5 is supplemented with the following:

(*****)

"Geosynthetic Clay Liner with Lamination", per square yard.
"Geosynthetic Clay Liner with Lamination Enhanced", per square yard.
"Backfill for Sand Drains", per ton.

Add the following new section:

(*****)

2-13 Earthwork for Landfill

2-13.1 Description

Subsurface soil and groundwater are contaminated. A layer of clean/uncontaminated sandy soil with varying thickness currently covers the site. Two stockpiles of soil, gravel, and wood fiber are located east and southeast of the former sawmill, which is not known to be contaminated. Contractor may use the material in these stockpiles for haul road on site.

All construction traffic into and out of the site shall be from the west on South March Point Road. To reduce the noise level along the heronry along South March Point Road, construction traffic shall not be allowed directly from the Highway 20 on South March Point Road, south-east of the site entrance. Appropriate traffic control signage and measures shall be utilized to minimize the potential for accidents on public roads due to construction traffic.

All site soil must be placed beneath the low-permeability GCLL layer. No site soil/material may be placed above the GCLL. All earthen material above the GCLL must be approved imported material from commercial sources. One exception is the aboveground soil mound outside the landfill entrance, which may be used to backfill the excavation outside the gate, if approved by the Engineer.

The intent of the project is to regrade the site to a mound in accordance with the Plans. The specific objectives are to remove all solid waste outside the existing fence and place inside the landfill, vacate all material from BNSF right-of-way; reduce the footprint of the landfill on the south/southwest side along the existing drainage swale, and install the toe of the final cap in the mudflats at the existing toe of the landfill, and not beyond. Create a central mound and cap the site with engineered cap system.

The design is based on a balanced cut and fill. The central/top mound and elevation and its slope may vary to accommodate the quantity fluctuations.

The landfill contains industrial waste, mainly on the western and northern sides. Regulated waste may be encountered that does not classify as solid waste. Segregate such waste. Engineer will characterize the waste, then contractor shall dispose in an appropriate licensed facility. Other waste may be generated that cannot be disposed in the landfill, such as after capping the landfill. Transport and dispose offsite at an appropriate facility approved by the Engineer. No landfill waste/refuse is planned to be disposed offsite, except as noted.

The excavation and regrading shall begin at the northwest corner and proceed clockwise along the perimeter, such that the work closest to the heronry occurs when herons leave the nest in August. All work dates shown on the Plans to accomplish this are approximate. Excavation nearest to the heronry will be permitted when approved

by the Engineer.

Where excavating to the original grade along the pre-development shoreline, an Archeologist provided by the Engineer will be inspecting for presence of historical artifacts. The approximate location of the area where archeologist will inspect is shown on the Plans. If any artifact is identified stop work in that location, as directed by the Archeologist, and assist in further investigation. Work may proceed in other areas.

When travelling from contaminated to clean zones, decontaminate the tracks/tires with hot water pressure washer. Similarly, when using the same machine attachments, e.g. bucket, decontaminate prior to handling clean imported material.

Earthwork by the contractor shall be conducted by use of GPS-guided equipment to meet the design grades. The GPS shall be accurate to within 1 foot horizontally and .02 feet vertically. Engineer will provide the CAD surfaces for excavation and backfill. Initial GPS calibrations and testing shall be by a professional surveyor provided by a contractor, licensed in the State of Washington.

All project surveying, including final record survey shall be the responsibility of the Contractor. Contracting Agency may elect to conduct quantity surveys during the work.

Establish and maintain control points, baselines, boundaries, and alignments as needed. Verify grades during work as needed.

When travelling from contaminated to clean zones, decontaminate the tracks/tires with hot water pressure washer. Similarly, when using the same machine attachments, e.g., bucket, decontaminate prior to handling clean imported material.

2-13.2 Materials

Materials shall meet the requirements of the following sections:

Gravel Borrow, Incl Haul	9-03.14 (1)
Backfill for Sand Drains	9-03.13
Common Borrow Incl. Haul	9-03.14(3)
Crushed Surfacing Top Course	9-03.9(3)
Gravel Backfill for Walls	9-03.12 (2)
Ballast	9-03.9(1)
Select Borrow, Incl. Haul	9-03(14).2

Common Borrow Incl. Haul shall be Option 2 in Section 9-03.14(3).

Common Borrow shall be obtained from only the following two sources:

1. Granite Construction, Mt. Vernon, WA.
   Mike Bursey (425) 551-3148

2. Miles Sand and Gravel, Oak Harbor, WA.
   Ryan Brownfield (360) 661-4497

2-13.3 Construction Requirements

2-13.3(1) Outside the Gate

Waste has been encountered outside the landfill gate. The approximate extent of excavation is shown on the Plans. The actual horizontal and vertical extent will be determined during excavation, as determined by the Engineer. Excavation shall extend into the landfill such that the final toe of the final cap is at or east of the existing fence alignment.

Salvage the existing aboveground earthen berms outside the gate within the limit of work for use as backfill. This material may be used to backfill the excavation outside the gate above the groundwater table. Alternatively, if approved by the Engineer, this soil shall be used for grading the waste in the landfill area.

Protect the water vault, existing trees, and power pole and guy wire during the work.

Dewater the excavation as needed to complete the work. Groundwater removed shall be processed through the onsite treatment system and discharged into the sanitary sewer.

Backfill the completed excavation, after Engineer's approval, up to approximately 1 foot above the static water table with Gravel Backfill for Walls Bucket-compact the material as it is placed to minimize future movement. Alternatively, contractor may maintain dewatering and backfill the excavation with Gravel Borrow. If backfilling with Gravel Borrow, place the backfill in 12-inch-thick layers and compact with a walk-behind vibratory roller compactor, by a minimum of 3 passes, or as directed by the Engineer. Alternate compaction methods may be used if it meets equal compacting energy/effort.

Place a layer of Construction Geotextile for Permanent Erosion Control over the Gravel Backfill for Walls and backfill with salvaged aboveground earthen berm and Gravel Borrow. Place the material in 12-inch-thick loose lifts and compact with walk-behind vibratory roller by a minimum of 3 passes, or as directed by the Engineer. Backfill up to approximately 4 inches from the final grade. The final 4 inch of the backfill to final grade shall be Crushed Surfacing Top Course, to be placed near the end of the project, after the majority of construction traffic has ended. If the entire excavation is to be backfilled with Gravel Borrow, then each compacted lift shall be densified to at least 90% of the maximum dry density as determined by ASTM D1557, modified proctor.

2-13.3(2) Excavation and Regrading

The site was capped with approximately 18 inches of sand. The layer has been altered and its thickness varies across the site. Salvage as much as possible for use as landfill gas conveyance layer below the landfill cap and to fill the gaps within the waste during regrading. Other granular site soil may also be suitable for use as landfill gas conveyance layer. One example is the eastern boundary of the site, where an earthen berm was constructed during the landfill operations to mark the eastern boundary of the landfill. Engineer will determine if a certain material is suitable for use as landfill gas conveyance layer.

Conduct the site regrading around the perimeter of the landfill in clockwise direction and place in the fill areas. Approximate locations of cut and fill areas to achieve the top of waste grades are shown on the Plans as guide.

When excavating the waste, segregate any items/material that is suspected to not classify as solid waste. Examples are batteries, drums containing unknown substance, etc. Engineer will characterize the material for disposal. Other waste will be generated that may not be disposed on site. Segregate this material and transport and dispose offsite. Disposal shall be by Contractor under force account.

Excavate the waste on the north and east to the original mudflats. Excavate the mudflats as needed to remove any visual indications of contamination, e.g., discoloration, or as instructed by the Engineer.

Take necessary measures to prevent contamination of Enhanced GCLL and subsequent cap material when excavating and grading within the BNSF right-of-way by traffic or contaminated groundwater. Take necessary measures to meet this requirement. Primary measure will be by intercepting the groundwater before it reaches the work area where GCLL has been placed.

When excavating refuse at the railroad embankment, scrape the surface of the embankment, but do not excavate the embankment.

Slope the newly exposed mudflats within the BNSF right-of-way to the east at 0.3% slope to prevent ponding. Sloping may be by regrading the mudflats and/or placement of Backfill for Sand Drains.

Construct a 20 x 20 feet apron at the west end of the mudflats within the BNSF right-of-way using Ballast as shown on the Plans.

The eastern portion of the landfill exposed to the Bay is subject to tidal fluctuations. The high tide elevation is 10.27 MLLW. Excavation of the landfill exposed to the Bay below elevation 10.27 MLLW shall be conducted during the low tides. Conduct the work on the north side as much as possible, before removing the soil at the northeast corner, to prevent release of sediments into the Bay and avoid tidal fluctuations.

Remove the accumulated debris on the mudflats at the northeast area between the landfill and the railroad embankment and incorporate into the landfill.

When working around the perimeter and/or with tides, limit the extent of excavation each day to a segment that can be regarded and covered with GCLL Enhanced and Backfill for Sand Drains in the same tide cycle. Cover any exposed waste in the transition zone from existing to regarded shoreline with plastic sheeting, or other means, in the same tide cycle to prevent release of pollutants to the Bay.

No earthwork below elevation 10.27 MLLW will be allowed when the tide reaches elevation 8.0 MLLW. The toe of the final landfill cap along the Bay shall not extend beyond the existing toe of the landfill.

Excavation of the perimeter of the landfill along the southwest and south sides, along the existing swale, will be limited to excavating the waste away from the swale and placement inside the landfill. The purpose of this effort is to reduce the footprint of the landfill, by removing small amount of waste that may extend to the swale. The Engineer will determine the extent of removal.

The available historical information suggests the landfill waste along the eastern half of

the swale did not extend to the swale. Protect the trees along the swale unless Engineer determines their removal is necessary to complete the project.

In areas along the swale where the excavation does not reach the swale, construct a drain perpendicular to the swale to allow discharge of stormwater within the Backfill for Sand Drains and Select Borrow layers to the swale. The drain shall consist of a trench excavated perpendicular to the swale. Details of this Rock Drain are shown on the Plans.

Along the swale, limit the bottom of the cap system, including anchor trench for the GCLL, to approximately 6 inches above the swale low point.

Spread the excavated waste in the fill areas of the landfill in approximately 12 to 18-inch-thick lifts in and compact with sheepsfoot roller to a firm surface by a sheepsfoot compactor such C15 CAT 825, or equal by making 3 passes, or as directed by the Engineer. Fill all voids with soil and compact.

The final slope of the top portion of the landfill, above the top-grade break shown on the Plans, will vary based on the actual quantity of waste placed. Meet the intent of a final grade to have smooth, continuous grade.

Cover the GCLL placed over the newly-exposed railroad embankment with 12 inches of Ballast. Dress the ballast placed.

The Engineer may request additional earthwork and/or additional tasks to be conducted during the work that are deemed necessary to address unanticipated site conditions. The additional work shall be by Contractor under force account.

Contaminated waste generated by the Contractor, such as personal protective equipment, spent adsorbent material, etc. shall be disposed offsite.

2-13.3(3) Cap Construction

Construct the landfill gas conveyance layer with the salvaged cover soil, and/or other material approved by the Engineer. The fill thickness for this layer shall be at least 6 inches above the waste. Due to expected undulations of the surface of the waste, an average of 8-inch-thick layer of sand may be needed over the waste, as shown on the drawings. Fine grade the surface to a smooth surface. Remove any angular rock or other sharp objects from the surface.

Place the GCLL/Enhanced GCLL low permeability layer over the landfill gas collection layer and protect it against damage and contamination. All earthen material above this layer shall be imported material. See Geosynthetic Clay Liner for material storage, handling, and placement.

Construct the earthen cap over the GCLL/Enhanced GCLL. The layers are shown on the Plans and are from bottom to top: 1) 6-inch-thick layer of Backfill for Sand Drains, 2) a layer of Construction Geotextile for Permanent erosion Control, 3) 12-inch-thick layer of Ballast, 4) a layer of Construction Geotextile for Permanent Erosion Control, 5) 12-inch-thick layer of Common Borrow (Option 2), and 6) 6-inch-thick layer of Topsoil, Backfill for Sand Drains, or Crushed Surfacing Top Course, as shown on the Plans. Backfill for Sand Drains is used instead of Topsoil as the final layer below Elevation 10.27 MLLW. The

Crushed Surfacing Top Course layer shall be 4 inches thick outside the final footprint of the landfill (outside the entrance and within BNSF right-of-way) and 6 inches thick on the landfill.

Place each layer of earthen material in a single lift and track-compact by at least 3 passes, or as directed by the Engineer. Use low ground pressure dozer, such as D3 with contact pressure of less than 5 psi, and blade capacity of 2 cubic yards to place the Backfill for Sand Drains layer over the GCLL/Enhanced GCLL to protect it from damage. Subsequent layers may be placed with a D6 dozer.

When constructing the cap layers, avoid sudden starts, stops, and sharp turns to prevent damage to the geosynthetic layers, regardless of type of equipment used. Place the earthen material on the slopes parallel to the toe of the slope or from bottom to top.

Compact the Common Borrow layer along the final site Access Road by Case SV207E Single Drum vibratory compactor, or equal, by at least 3 passes, or as directed by the Engineer. Engineer will determine if the rolling shall be static or vibratory based on soil conditions. Contractor may propose alternate compactor for this task.

Construct the final site Access Road as shown on the Plans, by placing Select Borrow in two lifts and compacting each lift with at least 3 passes by the vibratory compactor, or as directed by the Engineer. Fine grade and compact the Select Borrow to a smooth surface to the dimensions shown on the Plans.

2-13.3(4) Submittals

Submit a bulk sample and sieve analysis and natural moisture content for every 10,000 tons of every imported earthen material type, except topsoil and Compost. Submit moisture-density test result (ASTM D1593) for Gravel Borrow. Additionally, submit analytical test reports for total petroleum hydrocarbons (TPH) for gasoline, diesel, and oil and Resource Conservation and Recovery Act (RCRA) 8 Metals: Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and Silver. When the analytical test result for Chromium is higher than 19 milligrams per kilograms (19 mg/kg, also analyze for Hexavalent Chromium. The analytical testing of the import material shall be conducted once at the start of the project. Cost related to this Work shall be incidental to other Work and included in the unit Contract prices that apply.

2-13.4 Measurement

Existing Sand Excavation, Salvage, and Reuse will be measured by the cubic yard and includes aboveground mound outside the landfill and onsite sand. Refuse Excavation and Grading Incl. Haul will be measured by the cubic yard. The original ground measurement will be taken using cross-section or digital terrain modeling survey techniques. Then the original ground will be compared with a survey of the excavation area taken after the Work is completed. Quantities shall be taken daily, or an approved frequency determined by the Engineer to ensure accuracy.

All work associated with import, placement, and compaction of the Select Borrow for Access Road construction shall be measured by Ton.

Gravel Backfill for Walls will be measured per ton.

Common Borrow Incl. Haul will be measured per ton.

2-13.5 Payment

Payment will be made for each of the following Bid items that are included in the Proposal:

"Existing Sand Excavation, Salvage, and Reuse", per cubic yard.

The unit Contract price per cubic yard for "Existing Sand Excavation, Salvage, and Reuse", shall be full compensation for excavating, loading, placing, or otherwise disposing of the material. This includes the existing aboveground berm outside the gate and on site sand to be salvaged.

"Refuse Excavation and Grading Incl. Haul", per cubic yard.

The unit Contract price per cubic yard for "Refuse Excavation and Grading Incl. Haul", shall be full compensation for excavating, loading, placing, or otherwise disposing of the existing refuse material incorporated into the landfill.

"Offsite Disposal", by force account.

"Offsite Disposal" will be paid for by force account as specified in Section 1-09.6. The payment for Offsite Disposal and other related unit Contract prices shall be full compensation for all costs incurred to perform the Work described in Section 2-13.3.

For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the total Bid by the Contractor.

"Additional Earthwork", by force account.

"Additional Earthwork" will be paid for by force account as specified in Section 1-09.6. The payment for Additional Earthwork and other related unit Contract prices shall be full compensation for all costs incurred to perform the Work described in Section 2-13.3.

For the purpose of providing a common Proposal for all Bidders, the Contracting Agency has entered an amount in the Proposal to become a part of the total Bid by the Contractor

"Gravel Backfill for Walls", per ton

"Common Borrow Incl. Haul", per ton

The unit Contract price per ton for "Common Borrow Incl. Haul" shall be full compensation for all costs incurred for excavating, loading, hauling, placing, or otherwise disposing of the material. The unit Contract price includes removing, disposing of, wasting, or stockpiling any material in the borrow site that does not meet the Specifications for "Common Borrow"

Division 8
MISCELLANEOUS CONSTRUCTION

8-01 Erosion Control and Water Pollution Control

8-01.1 Description

Section 8-01.1 is supplemented with the following:

(*****)
Provide monthly reports to Contracting Agency to submit to Ecology.

8-01.3 Construction Requirements

8-01.3(1) General

8-01.3(1)C Water Management

8-01.3(1)C7 Turbidity Curtain

Section 8-01.3(1)C7 is supplemented with the following:

(******)
Turbidity curtain shall be ABASCO, LLC — Type 1 Light Duty Turbidity Curtain TC-1-LD or Approved Equal.

Section 8-01.3 is supplemented with the following:

(******)
8-01.3(17) TEMPORARY DEWATERING SYSTEM

The location of the treatment system shown on the Plans is approximate based on the ground surface conditions, visual line of sight to the heronry, and proximity to the work areas. Actual location may be different. The system may be relocated after the end of the herons' breeding season.

Groundwater and construction stormwater runoff that flows over contaminated material shall not enter the Bay. Employ necessary methods to prevent discharge into the Bay.

The western approximately 1/2 of the landfill and northern area contains industrial waste and is heterogeneous. Groundwater flows through preferential pathways. The approximate eastern 1/2 of the site contains higher soil content and is more homogeneous.

Intercept the groundwater upgradient of the perimeter work area from collection pits or interception trenches to prevent groundwater from entering the work area or Bay during earthwork along the perimeter. Approximate location of an interception pit/trench is shown on the Plans.

Slope the work platform away from the Bay when excavating to prevent construction stormwater from entering the Bay. Employ other measures as needed to protect the newly placed cap material from becoming contaminated. The potential for recontamination of the cap material is high when excavating within the BNSF right-of-way. It may be necessary to maintain dewatering operation overnight. Actual approach will be decided based on the flows observed, and project limitations.

Pump all water collected, including decontamination water, to the treatment system for processing and discharge into sanitary sewer. Engineer will collect and analyze the treated water samples and seek approval for the discharge. Contractor may discharge treated water only if approved by the Engineer. Treated water discharge will be in batches until continuous discharge is approved by the wastewater treatment facility.

The sewer line has been capped on site. Coordinate and obtain approval/permit from the City to install a connection at the project boundary for discharge of treated water. Connection shall be as approved by the City, which is assumed to include a check valve. Process the treated water that fails the test through the system again, starting at the first settling tank.

The treatment system train and flow schematic are shown on the Plans. Contractor may propose changes to the system and/or piping for the Engineer to approve. The system shall have approximately 60,000 gallons of capacity for settling tanks prior to treatment and another 60,000 gallons of capacity after treatment as holding tanks. Tanks may be open top and/or with weir system.

The treatment system includes sand filter vessels, two filter bag housing in series to remove suspended solids and two granular activated carbon (GAC) one ton capacity vessels in series to remove dissolved organics. Sand filter system (multiple vessels) shall be Sand Media Filter 36-3SSK by Rain For Rent®, or equal. Maintain the filter media and replace as needed. Allow for one round of sand and GAC replacement and waste handling. Desiccate the waste generated and dispose the sand, the spent GAC, and any other waste generated offsite.

The system shall be capable of operating at 100 gallons per minute (gpm), complete with sample ports and flow meter as shown on the Plans. Employ every means to reduce the suspended solids placed in the settling tanks, such as by installing filtration measures at the pump intake. Minimize every means to reduce the processing organics through the GAC, such as using sorbent material in the settling tanks to remove sheens.

The actual groundwater removal flow rate is unknown. If needed, mobilize, install, operate, and maintain additional tanks and hoses to handle the capacity, only if approved by the Engineer.

Engineer will collect and analyze post-treatment confirmation samples and obtain discharge approval from the wastewater treatment facility. If a sample fails, Contractor to process the water in the tank through the treatment system again.

After Engineer notifies the Contractor to terminate the water treatment, decontaminate the components of the treatment system prior to demobilization. Engineer may elect to collect confirmation samples. Desiccate the waste generated and incorporate into the landfill. Exception is the spent GAC that shall be disposed offsite.

The Engineer may require deployment of Adsorbent Socks to contain any products or sheens that may be observed on the water during excavation. The Engineer will determine the nature of the pollutant and select absorbent material based on the nature of the pollutant. The oil absorbent boom shall be ABASCO AS5-10 oil absorbent booms, or equal, and hazmat boom shall be Spilfyter 3" diam. Premium Yellow Hazmat Absorbent Socks S2-37, or equal. Other elements may be necessary based on the conditions encountered. All work associated by this task shall be by force account.

8-01.3(18) Water Treatment System Operation

Groundwater removed and any other wastewater generated on site shall be processed through the onsite treatment system and discharged into the sanitary sewer as part of the system operation. Work includes processing treated water that fails testing.

8-01.4 Measurement

8-01.4(2) Item Bids

Section 8-01.4(2) is supplemented with the following:

(*****)

Temporary Dewatering System; installation and subsequent decontamination/decommissioning will be measured per lump sum.

Temporary Dewatering System Operation; operation and discharge will be measured per calendar day (up to 12- hour shift).

Additional Tank Mobilization; mobilization of 20,000 gallon-capacity tank, setup, decontamination/decommissioning, demobilization, and associated piping will be measured per each, per calendar day in operation.

Additional Tank Operation; operation of the additional tanks and discharge, per tank, per calendar day in operation.

After Hours Temporary Dewatering System Operation; will be measured per day (up to 12-hour shift).

8-01.5 Payment

8-01.5(2) Item Bids

Section 8-01.5(2) Payment is supplemented with the following:

(*****)
"Temporary Dewatering System", lump sum.

The lump sum Contract price for "Temporary Dewatering System" shall be full payment for all costs for performing the Work as shown on the Plans and described in these Special Provisions to design, furnish, install, decontaminate/decommission, and remove the Temporary Dewatering System including developing and implementing the Temporary Dewatering Plan.

“Temporary Dewatering System Operation”, per day.

The unit Contract price per day for “Temporary Dewatering System Operation”” shall be full payment for all costs for performing the Work as described in the Plans and described in these Special Provisions for temporary dewatering including operating, maintaining, monitoring, and all discharge and disposal in compliance with all applicable water quality standards and permit requirements. Includes consumables to operate the system. Includes one replacement of sand and one replacement of granular activated carbon.

"Additional Tank Mobilization", per each per lump sum.

The lump sum Contract price per each for “Additional Tank Mobilization” shall be full payment for all costs for mobilization, setup, decontamination, waste handling, and demobilization.

"Additional Tank Operation", per each per calendar day.

The unit Contract price per each for “Additional Tank” shall be full payment for all costs for performing the Work as described in the Plans and described in these Special Provisions for the operation of any Engineer approved additional baker tanks.

“Afterhours Temporary Dewatering System Operation”, per shift up to 12-hour shift.

The unit Contract price per day of “Afterhours Temporary Dewatering System Operation", per shift up to 12-hours, shall be full payment for performing the Work as described in the Plans and described in these Special Provisions including operating, maintaining, testing, monitoring, and all discharge and disposal in compliance with all applicable water quality standards and permit requirements that occurs outside of the normal approved working hours and approved by the Engineer.

“Offsite Disposal” will be paid for as defined in Section 2-13.5.

8-02 Roadside Restoration

8-02.1 General

Section 8-02.1 is supplemented with the following:

(*****)
Engineer will identify and select the source for topsoil and compost as well as Backfill for Sand Drains material.

8-02.3 Construction Requirements

8-02.3(1) Responsibility During Construction

Section 8-02.3(1) is supplemented by the following:

(******)
Approximate locations of existing known utilities have been shown on the Plans. Promptly notify the Engineer of any conflict between proposed work and obstructions.

Do not seed when the temperature is below 55 degrees F. Under no circumstances will seeding during freezing weather or in frozen ground be permitted. Remove all plant tags and flags prior to final inspection. Confine operations including material and equipment storage, to working areas allotted for operations.

Clean all paved surfaces and planted areas of soil and debris daily. Clean all paved surfaces affected by landscape work prior to final acceptance.

8-02.3(2) Work Plan

8-02.3(2)C Plant Establishment Plan

Section 8-02.3(2)C is supplemented with the following:

(******)
Submittals – Maintenance Schedule: Contractor shall submit to Engineer a schedule of watering and maintenance activities to be performed by Contractor during the construction of the contract, up to the point of final acceptance of planting and irrigation. The schedule shall delineate specific activities and their frequency during the period between time of initial planting and final acceptance and shall be submitted to the Engineer prior to written notification from the Engineer of the completion of initial planting for the project.

8-02.3(3) Weed and Pest Control

8-02.3(3)A Chemical Pesticides

(******)
Pesticides and herbicides shall not be used without written authorization from Engineer. At a minimum, Contractor shall notify Engineer for approval 30 working days prior to use. Approval by local and federal agencies may also be required prior to use. Spraying shall be conducted only by those with a Washington State applicator's license with an “aquatics” endorsement and an aquatics pest management permit from the Washington State Department of Ecology.

8-02.3(3)B Roadside Seeding, Planting and Lawn Area Weed Control

Section 8-02.3(3)B is supplemented with the following:

(******)
Hand Clearing of Invasive Plants **that colonize the site post grading activities**, prior to plant installation - Confirm limits of non-native invasive plants per field verification with Engineer before proceeding with clearing in these areas. Notify Engineer one week prior to removal date. Remove the following non-native invasive plants manually using hand tools and by hand pulling: Himalayan blackberry (rubus armeniacus), Japanese knotweed (polygonum cuspidatum), reed canary grass (phalaris arundinacea), English ivy (hedera helix), black locust (robinia pseudoacacia), and all other invasive species that have not been specifically listed. Remove all above ground plant material and remove below ground rhizomes and roots. Transport plant, root, and rhizome materials carefully to avoid contamination of adjacent areas and travel corridors. Remove and dispose of all invasive plant debris at an approved composting facility.

8-02.3(4) Topsoil

8-02.3(4)A Topsoil Type A

Section 8-02.3(4)A is supplemented with the following:

(******)
Topsoil Type A source to be identified by the Engineer.

8-02.3(5) Roadside Seeding, Lawn and Planting Area Preparation

8-02.3(5)A Seeding Area Preparation

Section 8-02.3(5)A is supplemented with the following:

(******)
Hydroseeding - Hydroseed areas as shown on the Plans. Contractor shall give the Engineer notice of seeding operation 48 hours prior to seeding. Apply fertilizer, seed, and mulch in one operation using approved hydraulic equipment at the following rates: recycled paper/wood fiber mulch combination: 50 pounds per 1,000 square feet. Seed: use rates provided for seed mixes in native plant schedule. Fertilizer: 10 pounds per 1,000 square feet or as recommended by supplier. Soil binding agent: 1 pound per 1,000 square feet or as recommended by supplier.

Do not hydroseed during windy weather or when temperatures are below 55 degrees F. Seeding season is March 1 to October 31, when supplemented with water. Do not hydroseed before or after these dates without written approval by the Engineer. Under no circumstances will seeding be permitted when ground is frozen, excessively wet, or otherwise un-tillable. Utilize water as carrying agent for equipment that has a continuous built-in agitation system. Equipment with a gear pump is not acceptable. Pump a continuous, nonfluctuating supply of homogenous slurry to provide a uniform distribution of material over designated areas. Promptly re-seed any areas which do not germinate within 14 days.

8-02.3(6)A Compost

Section 8-02.3(6)A is supplemented with the following:

(******)
Compost source to be identified by the Engineer. Install compost to the average minimum depth of 3 inches within planting area for riparian shrubs. Provide an 18-inch-radius seed-free ring covered with a 3” average minimum depth of compost. Keep compost 3” min. away from trunk of shrub. See landscape restoration planting plans and details for additional information.

8-02.3(6)B Fertilizers

Section 8-02.3(6)B is supplemented with the following:

(******)
Planting fertilizers shall be phosphate-free and organic, with 50 percent nitrogen in slow-release form. Fertilizer shall be selected based upon the test data analysis. Furnish fertilizer in standard unopened containers with weight, name of intended plant targets, nutrient content, and manufacturer's guaranteed statement of analysis clearly marked, in accordance with state and federal laws. Fertilizer shall be applied at the rate recommended by supplier.

Fertilizer Application - Shrubs and seeded areas: apply fertilizers to shrubs, and seeded areas at rates recommended by the manufacturer. Fertilizer shall be placed in planting pits at time of planting and shall not be broadcast on to soil surface. Efforts shall be taken to avoid fertilizers from coming into contact with waters of the state.

8-02.3(8) Planting

8-02.3(8)A Dates and Conditions for Planting

Section 8-02.3(8)A is supplemented with the following:

(******)
Plant Procurement - Within 30 days of award of contract, submit documentation to the Engineer that all specified plant materials have been ordered and secured. List supplier names, addresses, phone numbers, and the storage/growing location of the materials.

Plant Materials - Plants are to be nursery grown (no collected plants) in climatic conditions similar to the project site and be of a size at least equal to size specified, measured with branches in normal growing position. Measurements, caliper, branching, grading, quality, balling, and burlap are to follow code of standards of American Association of Nurserymen, unless otherwise specified. Washington native plants are to be propagated from western Washington genetic stock. All plant material shall be of accepted size standards as specified in American Standard for Nursery Stock - latest edition. All plants shall be of normal habit of growth, and shall be healthy, vigorous, and free of disease, insect eggs, and larvae. Scientific nomenclature shall conform to standard plant names. Names not present in this listing shall conform to accepted scientific nomenclature in the nursery trade. For shrubs, no less than 10 percent of each variety or species of plant shall be accurately labeled. Plant material labels shall be durable, legible labels stating the correct scientific plant name. All plants shall be at least equal to size specified on plant legends. Oversize plants are acceptable, but without increase in contract price. Shrubs cut back from larger sizes will not be permitted.

Plant Material Installation - Protect plant materials stored on site from weather damage, construction activity, and the public. Protect roots by covering with moist soil and mulch. Water as required to keep roots moist. Plant shrubs per the planting details in the Plans.

Plant Inspection - The Engineer reserves the right to refuse any/all plant material that does not meet the requirements of the Plans and Specifications at any time prior to final acceptance.

Shrubs shall exhibit overall form typical of the species, be uniformly branched with a symmetrical crown, and be sound, vigorous, healthy, and free from disease. Plants with damaged leaders, damaged bark, sunscalds, windburn, disfiguring knots, circling or ground roots, or broken and cut limbs will be rejected.

Container-grown plants shall have been grown in the containers in which they are delivered for at least 6 months, but not over 2 years. Samples must prove no root-bound conditions exist. Root-bound plants and container plants that have cracked or broken balls of earth when taken from container will be rejected except upon written approval by the engineer.

Plant Layout - Verify the locations of all elements of the landscape installation prior to installation. Engineer reserves the right to adjust the locations of landscape elements during the installation period as appropriate.

Riparian Shrub Area Plantings - Orient plants for best natural upright appearance and exposure. Completely remove all container materials, including wire baskets, peat pots, ties, and labels, from root balls; gently agitate root bulbs to remove soil and spread the roots during planting. Notify the Engineer of any conditions detrimental to plant growth (such as rubble fill, stones, adverse drainage conditions, or obstructions) before planting.

Notify the Engineer if underground utilities, solid rock ledges, membranes, fabrics, or other subsurface obstructions are encountered during planting so that alternative planting locations may be selected. Avoid over-excavation of planting pits. Over-excavated pits shall not be used for planting, but rather shall be backfilled and a new planting prepared within close proximity. Add granules of fertilizer to planting pits according to manufacturer's directions.

Planting pits shall be dug to produce vertical sides and flat, uncompacted bottoms. If the sides become glazed, the glazed surface shall be scarified. The size of plant pits shall be as shown on Plans. Set plants in center of planting pits, on uncompacted backfill consisting of imported topsoil that has been amended with compost (25 percent compost by weight). Prune broken roots and stems.

Plants shall have the same relationship with finish grade after settlement as they bore at natural grade. The top true root of plants shall be just below soil surface after settlement. Hold firmly in position and place backfill mixture carefully, avoiding root damage and filling voids. When planting pit is approximately two-thirds full, compact fill by watering to avoid air pockets. Water to settle.

As-built Plan Set - Provide Engineer with a set of clearly marked prints showing the actual location of all landscape elements prior to the final acceptance of the work. Keep a set of prints on the job site for “red-lining” record information and update said information as

needed. Engineer reserves the right to review or request copies of such plans at any time during construction

The dates for planting shall be September 1 through November 1.

8-02.3(9) Seeding, Fertilizing, and Mulching

8-02.3(9)C Seeding with Fertilizers and Mulches

Section 8-02.3(9)C is supplemented with the following:

(******)
Hydroseeding - See Plans for seed mix composition. Seed furnished for installation shall be the following: at least 90 percent pure and 100 percent free from noxious weed seeds; at least 80 percent pure live seed, grade a, recent crop; treated with appropriate fungicide at time of mixing; stored in a manner to prevent wetting and deterioration; and delivered to the project site in sealed containers with dealer's guaranteed analysis.

Hydroseeding fertilizer shall be phosphate free and organic, with 50 percent nitrogen in slow-release form, as described in 8-02.3(6)B.

Mulch for hydroseeding shall consist of 50 percent specially processed cellulose fiber (100 percent recycled, post-consumer paper content) and 50 percent wood fiber mulch. Mulch product shall contain no growth or germination-inhibiting factors. Mulch shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content. Mulch shall be chemically inert and nontoxic to plants, humans, and animals.

Soil binding agent shall consist of nontoxic, biodegradable materials that are environmentally safe. Percentage of soil-binding agent shall not be less than 2 percent or greater than 10 percent by weight when mixed with wood fiber mulch.

8-02.3(12) Inspection and Completion of Initial Planting

8-02.3(12) is supplemented with the following:

(******)
Final Acceptance - Final acceptance of the landscape work in this section will be made by the Engineer after an inspection to determine 100 percent completion of the contract work and all punch list items.

8-02.3(13) Plant Establishment

8-02.3(13) is supplemented with the following:

(******)
Maintenance – Provide landscape maintenance beginning at the first installation of plant material and continuing up to final acceptance of the landscape and irrigation installation,

including watering, weeding, spraying, fertilizing, resetting of plants, removal of dead or damaged plants, replanting and adjustment of staking.

8-02.3(14) Plant Replacement

8-02.3(14) is supplemented with the following:

(******)
Guarantee and Replacement - All materials and workmanship shall be guaranteed up to the time of final acceptance. Re-grade and add or remove topsoil as required to any finished landscape surfaces that have settled or become uneven during the guarantee period. Identify plants to be replaced with flagging and leave plants in place until approved by Engineer. Perform guarantee inspections a minimum of once a month during guarantee period and furnish the Engineer with monthly written documentation of all materials flagged, removed, or replaced, as well as their locations, species type, and quantities. Contractor shall replace any dead, damaged, diseased, dying, or missing plant materials at no cost to the Contracting Agency during the guarantee period. Replacement plants shall be as specified and guaranteed until completion of the guarantee period. Reposition plant material that settles or shifts from upright position during the guarantee period. Guarantee does not apply to plant materials or other work damaged or destroyed by vandalism, vehicular damage by others, or acts of God during the guarantee period. It is the responsibility of the Contractor to assure that the site is receiving proper maintenance during the guarantee period. Engineer shall be given 30 days written notice by the Contractor to rectify substandard maintenance prior to the Contractor rejecting any guarantee claims. Guarantee claims may only be voided due to substandard maintenance if the Engineer takes no action to correct the identified substandard practices during the 30-day notice period.

Replace rejected or damaged plants at no additional expense to the Contracting Agency.

Substitutions - Substitutions of plant materials will not be permitted, unless authorized in writing by the Engineer 30 days prior to scheduled start date of installation. If proof is submitted that a specified plant is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of contract price.

8-02.5 Payment

Section 8-02.5 is supplemented with the following:

(*****)
"Planting" per Lump Sum

The unit Contract price per lump sum for "Planting" shall be full payment for all costs for performing the Work as described in the Plans and described in these Special Provisions for the Procurement, delivery and planting of all plants. Soil amendments (e.g., compost) shall be part of the Work under Planting and the cost for such will be incidental to this Work.

8-03 Irrigation Systems

8-03.1 Description

Section 8-03.1 is supplemented with the following:

(******)
Provide solar powered temporary irrigation within the planting zones for lagoon and swale areas. Work to be performed includes, but is not limited to, the following: provide and install irrigation heads, pipes, quick couplers, fittings, valves, valve boxes, strainer system, backflow device, valve control wire and solar powered controller. Provide all other related items required to complete the work following the best accepted trade practices.

8-03.2 Materials

8-03.2 is supplemented with the following:

8-03.2 (9-15.1(2)) Polyvinyl Chloride Pipe and Fittings

Section 9-15.1(2) is supplemented with the following:

(******)
Plastic Pipe - PVC class 200 shall be used for all lateral piping (downstream from valves) and schedule 40 for pressure lines. Pipe to be marked with manufacturer's name, class of pipe, National Sanitation Foundation (NSF) seal, and date and shift of manufacturing run. Pipe to bear no evidence of interior or exterior extrusion marks. Pipe walls to be uniform, smooth, and glossy. Pipe may be pre-belled or with individual solvent-weld couplings. Fittings: schedule 40, full size. Sleeving: PVC schedule 40 or better.

8-03.2 (9-15.3) Automatic Controllers

Section 9-15.3 is supplemented with the following:

(******)
Controllers shall be compatible with solar power and installed in weather-proof enclosures. Controllers will be installed "freestanding" unless otherwise approved in writing. They shall be located at a prime observation area with good access and be free from irrigation overspray. Controllers will not be required when battery-operated valves with built-in timers are used.

8-03.2 (9-15.4) Irrigation Heads

Section 9-15.4 is supplemented with the following:

(******)
Sprinkler Heads - Heads of different manufacturers or of different basic types (bubbler, stream, standard, low flow rate, impact, etc.) shall have consistent operating characteristics on any single lateral circuit. Heads on same lateral circuit shall be balanced for matched precipitation rates within five percent from the average for any different arcs of coverage or operating radii. Sprinkler heads shall be designed so that spray adjustments can be made by either an adjustment screw or interchangeable nozzles (such as the TORO 300 Series Multi-stream shrub rotators with low gpm nozzles [shown in concept plan] or approved equal).

8-03.2 (9-15.5) Valve Boxes

Section 9-15.5 is supplemented with the following:

(******)
Provide standard 12-inch valve box for all valves; 6-inch valve box for quick couplers and gate valves.

8-03.2 (9-15.7(2) Automatic Control Valves

Section 9-15.7(2) is supplemented with the following:

(******)
Control valves shall be manifold where feasible, group together in valve boxes or individually installed in single valve box. Valves shall be slow closing design, and automatically close in the event of power failure. Valves shall be sized to provide adequate pressure differential for proper operation. Valves may be battery operated. PVC pipe upstream of the control valves shall be schedule 40. PVC pipe immediately downstream of the valves shall be class 200.

8-03.2 (9-15.8) Quick Coupling Valves

Section 9-15.7(2) is supplemented with the following:

(******)
Quick Coupling Valves - Provide a quick coupler with lid for blow out.

8-03.2 (9-15.17) Electrical Wire and Splices

Section 9-15.17 is supplemented with the following:

(******)
Control Wire - Wire shall be #14 UF direct burial wire. The common wire shall be white, the valve impulse wire shall be red, the master valve wire shall be yellow, with a fourth color of wire provided as a spare. Wire shall not be required with use of battery-operated valves.

Add the following new section:

(******)
8-03.2 (9-15.20) Miscellaneous Irrigation System Components

Backflow Prevention Assembly (BPA) - All water services shall have an Engineer-approved BPA. Installation shall comply with applicable health and safety codes and Contractor shall contact Skagit Public Utilities District for inspection after BPA is installed and tested. Install a “Y”-strainer to protect the BPA and install schedule 40 PVC ball valves at inlet and outlet to drain BPA for winterizing. Pipe upstream of the BPA shall be schedule 40 PVC and pipe immediately downstream of the BPA shall be schedule 40 PVC.

Isolation Valve - Provide up to two mainline isolation valves to be located upstream from the backflow preventer. Valve shall be schedule 40 PVC. Provide valves to divide the irrigation system into controllable units, and to avoid draining long runs of piping for system repairs.

Risers shall be fixed schedule 40 and firmly staked.

Drain Valves - Provide inlet and outlet drain valves to sufficiently winterize system. Other drainage features may be added as necessary to winterize system.

Soil Moisture Sensor – Utilize Rainbird SMRT-Y Soil Moisture Sensor, or approved equal, to allow for override of the watering schedule.

8-03.3 Construction Requirements

8-03.3(1) General Requirements

Section 8-03.3(1) is supplemented by the following:

(******)
The irrigation system shall be temporary and solar powered; piping shall be on-grade and secured to grade, located next to the permanent fence. The system shall operate for a period sufficient to establish plant and seeded material and to provide sufficient coverage to prevent soil erosion. No elements of system shall penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap. The system shall be designed to operate correctly at the lowest available operational pressure expected during the year and shall withstand system surges.

During establishment a minimum 2 inches of water, including precipitation, shall be provided to planting areas every 2 weeks from June 1 through September 15. Ensure adequate watering for 100% of the plants to be alive, healthy, established and vigorously growing. Contractor to measure and ensure 2 inches of watering needs are fulfilled and to adjust per weather and site conditions. Watering will be controlled by timers to allow for separate water schedules for each zone. Moisture sensor(s) will be installed that allow for override of the watering schedule.

8-03.3(2) Submittals

Section 8-03.3(2) is supplemented with the following:

(******)
Submit a temporary solar powered irrigation plan, including power assumption calculations, for approval by the Engineer at least 10 working days prior to ordering the materials for the irrigation system. The plan shall describe the methods, materials, and manufactures list for construction both graphically and in writing. The plan shall show diagrammatic layout based on the irrigation concept plan provided. Actual layout will be adjusted per actual field conditions.

Submit to Engineer a schedule of watering and maintenance activities to be performed by Contractor during the construction and maintenance period of the contract. The schedule shall delineate specific activities and their frequency during the period between time of initial work and final acceptance and shall be submitted to the engineer prior to written notification from the Engineer of the completion of initial planting for the project.

Final Acceptance - Complete all punch list items and submit signed and approved sprinkler/plumbing/health/electrical permits as applicable for final acceptance.

8-03.3(3) Layout of Irrigation System

Section 8-03.3(3) is supplemented by the following:

(******)
Layout - Verify the locations of all elements of the landscape installation prior to installation. The Engineer reserves the right to adjust the locations of landscape elements during the installation period as appropriate.

8-03.3(4) Irrigation Water Service

Section 8-03.3(4) is supplemented by the following:

(******)
Water Supply – The point of connection (POC) shall be furnished by the Contracting Agency. Test the point of connection to determine the available pressure and gallons per minute prior to installation of the irrigation system. Water supply shall be clean and free of suspended particles, algae, or chemicals that may form insoluble precipitates in the equipment or may be detrimental to plantings.

Verify in writing to the Engineer that adequate water flow volume and pressure are available to properly operate the irrigation system prior to installation of the irrigation system.

8-03.3(9) Irrigation System Installation

8-03.3(9)A General

Section 8-03.3(9)A is supplemented by the following:

(******)
Substitutions - Upon acceptance by Engineer of the temporary solar powered irrigation plan prepared by the Contractor, no material substitutions shall be made without written approval of the Engineer.

Cleanup - Clean all paved surfaces and planted areas of soil and debris on a daily basis. Clean all paved surfaces affected by irrigation work prior to final acceptance. Clean up spills of glues and solvents immediately and report them immediately to the project engineer.

Maintenance - Provide maintenance of the irrigation system until 30 days beyond final acceptance. Maintenance shall include head and nozzle adjustment, setting and adjusting controller times, and replacing defective materials.

Guarantee and Replacement - All materials and workmanship shall be guaranteed for a period of one year. Guarantee period shall commence at the time of final acceptance of the irrigation installation. This guarantee period does not apply to work or damage done to the system by others after final acceptance.

Pipe Fittings - Transport and store pipe on a flat even surface. Seal all threaded joints with Teflon tape. No PVC shall be threaded or connected to a threaded fitting without an

adapter. Keep pipe free from dirt or debris at all times. Cover ends of pipe when not in progress of installation. Connect pipe using two-step solvent weld process. Do not move or handle pipe for a minimum of 15 minutes while solvent welds are curing. No water shall be permitted in pipe until a period of at least 10 hours has elapsed for solvent welds to sit and cure. The joints shall be allowed to cure at least 24 hours before pressure is applied to the system.

Install sleeves at road crossings using 4 inch diameter, SDR 17 HDPE pipe to install the irrigation line under the road, as shown on Plans.

8-03.3(9)B Irrigation Heads

Section 8-03.3(9)B is supplemented by the following:

(******)
Sprinklers - Install sprinklers aboveground and secure to prevent from leaning or falling over. Install sprinkler heads perpendicular to finish elevation.

Risers shall be set a minimum of 18 inches above finish grade. Secure each riser to prevent movement; riser shall be plumb to adjacent grade. Avoid using stakes. If stakes are required obtain approval from Engineer prior to installation and ensure no elements penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap.

8-03.3(9)C Valve, Valve Boxes, Hose Bibs

Section 8-03.3(9)C is supplemented by the following:

(******)
Backflow Prevention Assembly (BPA) and Strainer - Install BPA and strainer system per local code requirements. BPA shall be plumbed with unions on each side to facilitate removal during winter months. Flush lines prior to installation of BPA, set BPA with a minimum clearance of 12 inches, and install strainer upstream of the BPA. Install BPA in a location where it will be accessible for periodic testing and maintenance and provide inlet and outlet drain valve on each side of BPA for winterizing. Place BPA between the water meter and irrigation system. BPA assembly shall be kept away from pedestrian and vehicular travel ways and housed within an enclosure.

Quick Coupling Valves - Install fitting between water meter and backflow preventer and secure as necessary. Avoid using stakes. If stakes are required obtain approval from Engineer prior to installation and ensure no elements penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap.

8-03.3(9)E Controller

Section 8-03.3(9)E is supplemented by the following:

(******)
Controller - Provide power to the irrigation controller utilizing a solar panel to recharge internal rechargeable battery. Provide all other electrical work necessary to make the equipment operate properly. Mount controller per the manufacturer's specifications in location approved by the Engineer. Controller will be exterior mounted on a treated 4x4 wooden post, or as directed by Engineer. Assure that no elements penetrate the finish

grade elevation more than 1 foot to ensure integrity of landfill cap. Sequence the valves per the number system on the Plans. Affix a weatherproof copy of sequence diagram to the inside of the controller cabinet door. Provide copy of valve sequence in the operations manual.

8-03.3(9)G Electrical Wire Installation

Section 8-03.3(9)G is supplemented by the following:

(******)
Control Wiring - Install control wires in continuous runs and tape wires in bundles at 10-foot intervals. Tape bundles to the bottom of mainline at 10-foot intervals. Provide a 24-inch loop of excess control wire at each valve box. All wire splices shall be made with a waterproof, direct-bury connector. Provide a separate color-coded common wire and control wire from the master valve to the satellite controller. If more than one satellite controller is assigned to the same master valve, provide a separate color-coded common control wire from each additional satellite controller to the master satellite.

8-03.3(10) Flushing and Testing

8-03.3(10)A General Testing Requirements

Section 8-03.3(10)A is supplemented by the following:

(******)
Inspections - Provide 48-hour notice for inspection of head layout, pressure tests, and performance tests.

8-03.3(10)C Mainline or Lateral Hydrostatic Pressure Testing

Section 8-03.3(10)C is supplemented by the following:

(******)
Performance Tests - Operate the system in the presence of the Engineer. Engineer may request that up to 5 percent of total nozzles be replaced, as appropriate to site conditions, at no additional cost to Contracting Agency.

8-03.3(13) As-Built Plans, M&O Manuals, and Operating Tools

8-03.3(13)A As-Builts

Section 8-03.3(13)A is supplemented by the following:

(******)
Inspection - Prior to final acceptance of the work, provide the Contracting Agency with all keys, tools, and maintenance manuals necessary to operate / deactivate the irrigation system. The Contractor shall train and instruct Contracting Agency as to the operation and maintenance of the irrigation system.

As-Built Plan Set - Prior to the final acceptance of the work, provide the Engineer with a set of clearly marked plans showing actual locations of irrigation elements. Keep a set of plans on job site for “red-lining” record information and update said information as needed.

Engineer reserves the right to review or request copies of such plans at any time during construction.

8-03.3(13)B Maintenance & Operations Manuals

Section 8-03.3(13)B is supplemented by the following:

(******)
The manual shall also include as-built drawing of the temporary irrigation system, control settings, a valve sequence operation diagram, list of installed parts, and recommended spare parts list for all equipment installed at the facility prior to the start of the system checkout. The copies shall be neat, clean copies and include catalogs and shop drawings where applicable. Information for other models or equipment not supplied shall be omitted or crossed out.

8-03.3(14)B Irrigation System Orientation Meeting

Section 8-03.3(14)B is supplemented by the following:

(******)
Training - Provide control system programming and operations training to the Contracting Agency and/or Engineer prior to final acceptance.

8-03.5 Payment

The second paragraph of Section 8-03.5 is supplemented with the following:

(*****)
This also includes the preparation, submission, and Engineer's approval of the irrigation plan as described in the Plans.

8-12 Chain Link Fence and Wire Fence

8-12.1 Description

Section 8-12.1 is supplemented with the following:

(******)
This Work shall consist of the furnishing and installing of temporary chain link fence in accordance with the Plans, the Standard Specifications, the Standard Plans, and these Special Provisions at the locations shown on the Plans.

8-12.2 Materials

Section 8-12.2 is supplemented with the following:

(******)
Temporary Chain Link Fence

Temporary fencing shall be composed of portable sectional chain link fence with privacy screen on commercial grade concrete blocks.

(******)

Coated Chain Link Fence

Chain Link Fence shall be 6-foot Type 3. Chain link fence fabric shall be hot-dip galvanized with a minimum of 0.8 ounce per square foot of surface area.

Fencing materials shall be coated with an ultraviolet-insensitive plastic or other inert material at least 2 mils in thickness. Any pretreatment or coating shall be applied in accordance with the manufacturer's written instructions. The Contractor shall provide the Engineer with the manufacturer's written specifications detailing the product and method of fabrication. The color shall match SAE AMS Standard 595 color number 14187.

Samples of the coated fencing materials shall have received the Engineer's acceptance prior to installation on the project.

The Contractor shall supply the Engineer with 10 aerosol spray cans containing a minimum of 14 ounces each of paint of the color specified above. The touch-up paint shall be compatible with the coating system used.

Reference Standards

Perform finish fencing in accordance with standards of American Society for Testing and Materials (ASTM).

1. ASTM F567 – Standard Practice for Installation of Chain Link Fence.
2.
3. ASTM F626 – Specification for Fence Fittings.
4.
5. ASTM F934 – Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials.
6.
7. ASTM F1043 – Specification for Strength and Protective Coatings On Metal Industrial Chain Link Fence Framework.
8.
9. ASTM F1083 – Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
10.

ASTM F1916 – Standard Specifications for Selecting Chain Link Barrier Systems with Coated Chain Link Fence Fabric and Round Posts for Detention Applications. (For grounding reference only)

8-12.3 Construction Requirements

8-12.3(1) Chain Link Fence and Gates

Section 8-12.3(1) is supplemented with the following:

(******)

Remove permanent fence spoil cuttings and debris from site.

Temporary Chain Link Fence

The Contractor shall install temporary chain link fence around the work area needed for construction, as shown in the Plans.

Temporary fence shall be chain link and set into temporary concrete base. The sections shall be placed in a neat, tight line with no openings or gaps in the temporary fence line. The temporary fencing along the railroad track must be at least 10 feet away from the track centerline, and it may be 4-foot high, high visibility fence.

Privacy screen shall be affixed to the fence, in accordance with supplier recommendations, along the roadway or where accessible to the public. The fencing sections shall measure no less than 6 feet in height. The length of each section shall not exceed 10 feet. Temporary fencing shall be self-supported chain link panels that can be fastened together to form a continuous fence.

8-12.4 Measurement

Section 8-12.4 is supplemented with the following:

(******)
Temporary chain link fence will be measured by the linear foot along the line of the fence in place.

High Visibility Fencing will be measured the linear foot along the line of the fence in place.

8-12.5 Payment

Section 8-12.5 is supplemented with the following:

(******)
“Temporary Chain Link Fence”, per linear foot.

“Coated Chain Link Fence Type ___”, per linear foot.

“Coated End, Gate, Corner, Pull Post for Chain Link Fence”, per each.

“Double 14 Ft. Coated Chain Link Gate”, per each.

“Double 20 Ft. Coated Chain Link Gate”, per each.

“High Visibility Fencing”, per linear foot.

8-33 Landfill Gas Collection System

8-33.1 Description

Work includes installation of perforated or slotted HDPE piping, wrapped in Construction Geotextile for Permanent Erosion Control, within the landfill gas collection layer above the regraded waste and installation of HDPE or PVC risers through the final cap for venting.

8-33.2 Materials

Materials shall meet the requirements of 9-38 Landfill Gas System Materials.

High Density Polyethylene (HDPE) Pipe for Landfill Gas System Materials	9-38.1
Construction Geotextile for Permanent Erosion Control	9-33 (Tables 4 and 5, Class C)

8-33.3 Construction Requirements

Install a permanent passive landfill gas collection and venting system as shown on the Plans.

The collection piping shall be installed on top of the waste, within the salvaged sand collection layer to be placed on the landfill waste at two tiers, first at the location of the lowest grade break and the second at the final ridge of the landfill.

8-33.3(1) Backfill for Landfill Gas Collection System

Backfill for landfill gas collection system shall be salvaged sand from site.

8-33.3(2) Pipe Venting Installation for Landfill Gas Collection System

Pipe for pipe venting system shall be 4-inch diameter, perforated or slotted HDPE pipe with SDR 17 or less. The pipe may be smooth or corrugated. The pipe shall be wrapped in filter fabric to minimize soil entering the pipe. Separate pieces of pipe shall be butt-fused, or if utilizing corrugated pipe with slip-on connections, the overlap shall be secured with screws on four sides.

8-33.3(3) Pipe Vent Installation for Landfill Gas Collection System

Vent pipes shall be 2-inch diameter, smooth, HDPE or PVC with a 180-degree turn, approximately 2 feet above the final grade, as shown on the Plans. The vents shall be fitted with bird screens to prevent animal intrusion and clogging.

8-33.4 Measurement

The length of pipe for Landfill Gas Venting will be by the linear foot of pipe installed and shall be measured along the pipe through fittings, and couplings.

Landfill Gas Vents will be measured per each.

8-33.5 Payment

Payment will be made for the following Bid item when listed in the Proposal

“Landfill Gas Venting Piping”, per linear feet.

The unit Contract price per linear foot for “Landfill Gas Venting Piping” shall be full pay for all Work to complete the installation of the Landfill Gas Venting Piping system.

“Landfill Gas Vents”, per each.

The unit Contract price Bid per each for “Landfill Gas Vents” shall be full pay for all Work to install the Landfill Gas Vent, including the screen.

(******)

8-34 FIELD OFFICE BUILDING

8-34.1 Description

This work shall consist of furnishing and setting-up a temporary office building for the sole use of the Contracting Agency.

The building shall be set-up, at the location designated by the Engineer, within the first 10 working days, unless the Engineer has approved a different schedule.

8-34.2 Vacant

8-34.3 Construction Requirements

The building shall be weather-tight, installed plumb and level, and provided with the following as a minimum:

1. 240 square feet of floor space
2. Above ground floor with stairs
3. Heating and Air Conditioning System
4. Lights
5. Sanitary facilities
6. Locking Doors and windows

There are no utility services to the site. Contractor is responsible to provide power to the field office trailers and other needs of the project

The building shall remain the property of the Contractor and removed from the site upon physical completion of the contract, or when designated by the Engineer.

8-34.4 Vacant

8-34.5 Payment

Payment will be made for the following bid item when included in the proposal:

"Field Office Building", lump sum.

The lump sum contract price for "Field Office Building" shall be full pay for furnishing, installing, maintaining, and removing the facility, including all costs associated with all required utility hook-ups and disconnects, and monthly utility charges for all utilities.

Division 9
MATERIALS

9-03.14 Borrow

9-03.14(2) Select Borrow

The table in Section 9-03.14(2) is deleted and replaced with the following:

(******)
9-03.14(2) Select Borrow shall conform to the following grading and quality:

Sieve Size	Percent Passing
3 inch	100
No. 40	50 max.
No. 200	10.0 max.
Sand Equivalent	30 min.

9-03.14(3) Common Borrow - Option 2

Section 9-03.14(3) is supplemented with the following:

(******)
9-03.14(3) Common Borrow shall meet the requirements shown under Option 2 in the Soil Plasticity Table.

Add the following new sections:

(*****)
9-33 Construction Geosynthetics

Section 9-33.1 is supplemented with the following:

(******)
The GCLL for the project shall be CETCO's BENTOMAT CL®, and GCLL Enhanced shall be RESISTEX PLUS CL®, no substitutions.

9-38 Landfill Cap and Gas System Materials

9-38.1 Pipe for Landfill Gas Collection

Landfill gas collection and venting system shall be 4-inch diameter high density polyethylene (HDPE) piping with standard dimension ratio (SDR) of 17 or less. Landfill gas conveyance pipe shall be perforated with at least eight, 0.5 inch diameter perforations every linear foot. Alternatives such as slotted corrugated pipe with the same or better crushing strength may be used. Slotted pipes shall have opening size of 0.02 inch. Joints may be welded or mechanically coupled. When mechanically coupled, the coupler shall be screwed into each pipe by at least four rust proof screws all the way around. Vents shall be 2-inch diameter HDPE or PVC Schedule 80, with a screen at the opening.

9-38.2 Backfill for Landfill Gas Collection

The granular cover soil on site, “Salvaged Site Sand” shall be used to build the Landfill Gas Collection Layer.

APPENDIX E

TECHNICAL INFORMATION

BENTOMAT® CL CERTIFIED PROPERTIES

CETCO® Bentomat® CL is a reinforced geosynthetic clay liner (GCL) consisting of a layer of sodium bentonite between a polypropylene woven geotextile and a polypropylene nonwoven geotextile, which are needle-punched together and laminated to a polyethylene geofilm.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Woven Base Geotextile Mass/Area[1]	ASTM D5261	200,000 ft² (20,000 m²)	3.2 oz/yd² (108 g/m²) min.
Nonwoven Cap Geotextile Mass/Area[1]	ASTM D5261	200,000 ft² (20,000 m²)	6.0 oz/yd² (203 g/m²) min.
Bentonite Moisture Content[2]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[2]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[2]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[3]	ASTM D5993	40,000 ft² (4,000 m²)	0.75 lb/ft² (3.7 kg/m²) min.
Geofilm Density[1]	ASTM D1505	200,000 ft² (20,000 m²)	0.92 g/cm³
Geofilm Thickness[1]	ASTM D5199	200,000 ft² (20,000 m²)	5 mil (0.12 mm) min.
Geofilm Break Strength[1,4]	ASTM D882	200,000 ft² (20,000 m²)	14 lbs/in (2.5 kN/m) min.
Total Mass/Area[3]	ASTM D5993	40,000 ft² (4,000 m²)	0.84 lb/ft² (4.1 kg/m²) min.
GCL Moisture Content	ASTM D5993	40,000 ft² (4,000 m²)	35% max.
GCL Grab Strength[5]	ASTM D6768	200,000 ft² (20,000 m²)	30 lbs/in (5.3 kN/m) min.
GCL Peel Strength	ASTM D6496	40,000 ft² (4,000 m²)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[6]	ASTM D5887	250,000 ft² (25,000 m²)	5×10^{-12} m/s max.
GCL Index Flux[6]	ASTM D5887	250,000 ft² (25,000 m²)	1×10^{-9} m³/m²/s max.
GCL Hydrated Internal Shear Strength[7]	ASTM D6243	1,000,000 ft² (100,000 m²)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:

[1] Geosynthetic property tests performed on the geosynthetic components before they are incorporated into the finished GCL product.

[2] Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

[3] Reported at 0% moisture content.

[4] Geofilm tensile break strength performed in the machine and cross-machine directions using ASTM D882.

[5] GCL tensile strength testing is performed in the machine direction using ASTM D6768.

[6] ASTM D5887 is modified to include the laminated thin flexible membrane on the test specimen. Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure. ASTM D5887 (modified) testing is performed only on a periodic basis because the thin flexible membrane is essentially impermeable. The Bentomat® GCL core (without the flexible membrane) has a maximum hydraulic conductivity of 5×10^{-11} m/s with deaired distilled/deionized water. For more information, see CETCO® Technical Reference (TR) Nos. 111 and 112.

[7] Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

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IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please contact CETCO sales team. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.

MINERALS TECHNOLOGIES CETCO®

RESISTEX® PLUS CL CERTIFIED PROPERTIES

CETCO® Resistex® geosynthetic clay liners are engineered to provide the highest level of chemical compatibility in extremely aggressive leachate environments such as some coal combustion product storage facilities, mining operations, and industrial waste storage facilities. Site-specific compatibility testing is strongly recommended.[8]

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY	CERTIFIED VALUES
Base Scrim Non-woven Geotextile Mass/Area[2]	ASTM D5261	200,000 ft² (20,000 m²)	6.0 oz/yd² (203 g/m²) min.
Nonwoven Cap Geotextile Mass/Area[1]	ASTM D5261	200,000 ft² (20,000 m²)	6.0 oz/yd² (203 g/m²) min.
Bentonite Moisture Content[2]	ASTM D2216	1 per 50 tonnes	12% max.
Bentonite Swell Index[2]	ASTM D5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[2]	ASTM D5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[3]	ASTM D5993	40,000 ft² (4,000 m²)	0.75 lb/ft² (3.7 kg/m²) min.
Geofilm Thickness[1]	ASTM D5199	200,000 ft² (20,000 m²)	5 mil (0.12 mm) min.
Geofilm Break Strength[1,4]	ASTM D882	200,000 ft² (20,000 m²)	14 lbs/in (2.5 kN/m) min.
Total Mass/Area[3]	ASTM D5993	40,000 ft² (4,000 m²)	0.84 lb/ft² (4.1 kg/m²) min.
GCL Moisture Content	ASTM D5993	40,000 ft² (4,000 m²)	35% max.
GCL Grab Strength[5]	ASTM D6768	200,000 ft² (20,000 m²)	50 lbs/in (8.8 kN/m) min.
GCL Peel Strength[6]	ASTM D6496	40,000 ft² (4,000 m²)	3.5 lbs/in (610 N/m) min.
GCL Hydraulic Conductivity[7]	ASTM D5887	250,000 ft² (25,000 m²)	3 x 10^{-11} m/s max.
GCL Hydraulic Conductivity with geofilm	ASTM D5887	250,000 ft² (25,000 m²)	5 x 10^{-12} m/s max.
GCL Hydrated Internal Shear Strength[8]	ASTM D6243	1,000,000 ft² (100,000 m²)	500 psf (24 kPa) typ.@ 200 psf (9.6 kPa)

Notes:

[1] Geosynthetic property tests performed on the geosynthetic components before they are incorporated into the finished GCL product.

[2] Bentonite property tests performed before the bentonite is incorporated into the finished GCL product.

[3] Reported at 0% moisture content.

[4] Geofilm tensile break strength performed in the machine and cross-machine directions using ASTM D882.

[5] GCL tensile strength testing is performed in the machine direction using ASTM D6768.

[6] ASTM D6496 performed on the needle-punch geotextile bond only. This does not apply to the geofilm laminate bond.

[7] ASTM D5887 is modified to include the laminated thin flexible membrane on the test specimen. Index flux and hydraulic conductivity testing with deaired distilled/deionized water at 80 psi (550 kPa) cell pressure, 77 psi (530 kPa) headwater pressure and 75 psi (515 kPa) tailwater pressure. ASTM D5887 (modified) testing is performed only on a periodic basis because the thin flexible membrane is essentially impermeable. Historical data is provided upon request. The Bentomat® GCL core (without the geofilm) has a maximum hydraulic conductivity of 5 x 10^{-11} m/s with deaired distilled/deionized water. For more information, see CETCO® Technical Reference (TR) Nos. 111 and 112.

[8] Peak values measured at 200 psf (9.6 kPa) normal stress for a specimen hydrated for 48 hours. Historical data is provided upon request. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

IMPORTANT: The information contained herein supersedes all previous printed versions, and is believed to be accurate and reliable. For the most up-to-date information, please contact CETCO sales team. CETCO accepts no responsibility for the results obtained through application of this product. CETCO reserves the right to update information without notice.

Date: May 22, 2015

To: Koorus Tahghighi, John Long, Dave Haddock

Subject: GCL Compatibility Testing with Site-Specific Permeant from March Point Landfill, Anacortes, WA

This memo discusses the expected hydraulic performance of a polymer enhanced Geosynthetic Clay Liner (GCL), trade name Resistex Plus, with site-specific permeant fluid present at the subject project.

The test method being used to determine hydraulic conductivity of the GCL is ASTM D6766. The permeant fluid is a site-specific sample sent by Amec Foster Wheeler to CETCO's GAI-LAP accredited laboratory in Hoffman Estates, IL having the following properties:

Conductivity	45,600 µS/cm
pH	7.558
I*	.4379
RMD**	1.43

**Ratio of monovalent to divalent cations

*Ionic Strength

Element	ppm
Silver	≈0.0
Aluminum	0.9767
Arsenic*	≈0.0
Boron	≈0.0
Barium	≈0.0
Calcium	315.5
Cadmium	≈0.0
Chloride	11,500
Chromium	2.463
Copper	≈0.0
Iron*	≈0.0
Mercury*	≈0.0
Potassium	≈0.0
Magnesium	959.7
Manganese	≈0.0
Molybdenum	≈0.0
Sodium	7202
Nickel	≈0.0
Phosphorus	≈0.0
Lead*	≈0.0
Sulfur	383.2
Antimony	0.6024
Selenium*	≈0.0
Titanium	≈0.0
Zinc	≈0.0
Zircon	0.3337

Notes

1) Accuracy is ±0.005 ppm except for arsenic, iron, mercury, lead and selenium which have accuracy limits of 0.02 ppm.
2) The sample was diluted 1:99 prior to testing and the results scaled up by 100x.

Test conditions are per scenario 2 (no fresh water pre-hydration, indicative of worst case), method C (falling head, rising tailwater), and standard confining pressure of 5 psi as described in ASTM D6766.

Testing indicates a **hydraulic conductivity of Resistex Plus of 9.54 x 10^{-9} cm/s**. Recently, chemical equilibrium termination criteria as defined in ASTM D6766 was reached. Equilibrium is established when the ratio of the outflow-to-inflow electrical conductivity is 1.0 ± .01. This termination criteria is the most conservative of termination criteria noted in ASTM D6766, and is generally indicative of steady state flow.

Subsequent to hydraulic conductivity testing of the GCL, we've taken the liberty of preparing estimated leakage rates for a geofilm-laminated GCL as compared to the prescriptive liner system of at least two feet of 10^{-6} cm/s or lower permeability soil. Leakage calculations for the prescriptive liner system can be estimated using Darcy's Law:

$$q = k \cdot i = k \cdot \frac{(h + L)}{L}$$

Where:
q is the flow rate per unit area ($m^3/m^2/s$)

k is the hydraulic conductivity (m/s)

i is the hydraulic gradient

L is the liner thickness (m)

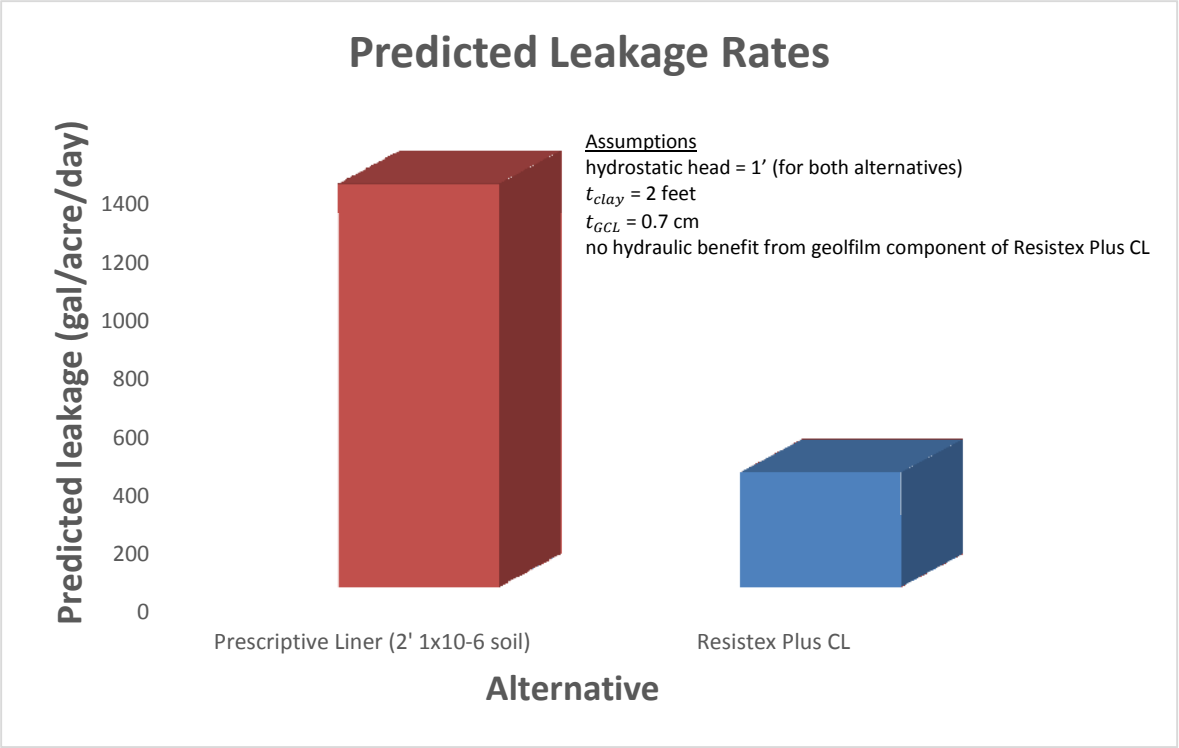
h is the hydraulic head (m)

Assuming the prescribed hydraulic conductivity of 10^{-6} cm/s and thickness of .6096m (2'), and a hydraulic head of .3048m (1'), it is predicated that the prescriptive liner system would allow leakage of **1,384 gallons/acre/day**.

A potentially better performing, lower-cost composite liner option is a geofilm-backed GCL, such as Resistex Plus CL. Resistex Plus CL consists of Resistex Plus with a 0.127-mm HDPE geofilm laminated to one side for improved hydraulic performance, as well as mitigation of the deleterious effects of wet/dry cycling and ion exchange in a capping application such as this. For simplicity of comparison purposes, we've calculated the predicted leakage rates of the Resistex Plus CL material ignoring any hydraulic performance benefits of the geofilm.

Using Darcy's Law, assuming the measured hydraulic conductivity of 9.54 x 10^{-9} cm/s and thickness of .7 cm, and a hydraulic head of .3048m (1'), it is predicted that Resistex Plus CL would allow leakage of **392 gallons/acre/day.** When we factor in the benefits of the overlying geofilm component, the expected leakage would be even lower.

Those predicted leakage rates are summarized in the chart below:



CETCO appreciates the opportunity to work on this project and welcomes any questions or comments you may have.

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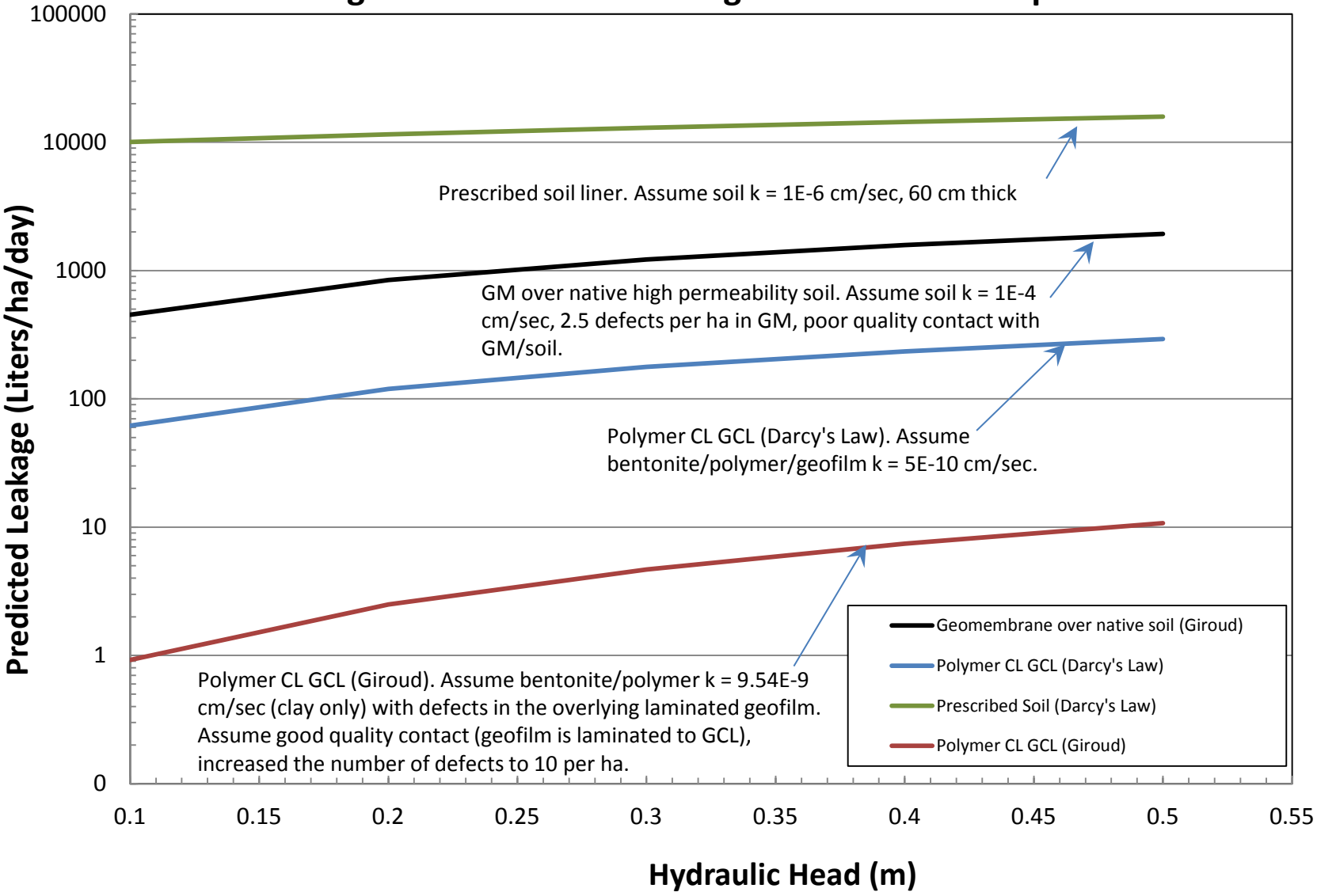
Exhibit 1: GCL test report provided under separate cover

Summary of Liner Leakage Calculations

Former Whitmarsh Landfill

July 2015

Figure 1 - Predicted Leakage Rates for Liner Options

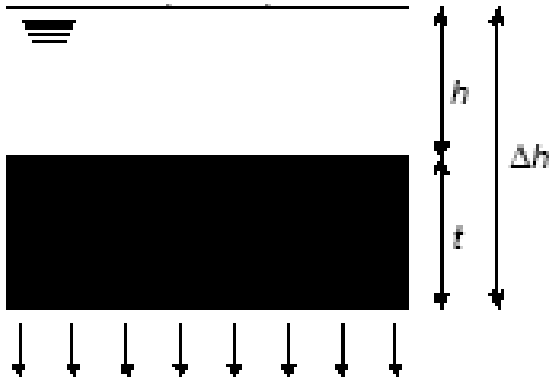


Assumptions - Soil

- Darcy's Law was used for calculating the prescribed soil leakage rates, using the following equation:

$$q = \frac{Q}{A} = ki$$

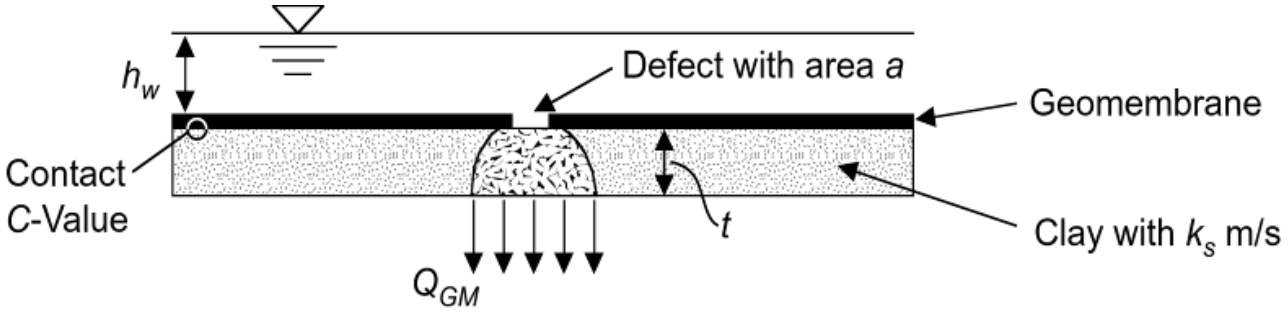
- k = hydraulic conductivity (1E-6 cm/sec)
- i = hydraulic gradient = (H+T)/T
- Where, H = hydraulic head (0 - 0.5 m) and
  T = Liner thickness (0.6 m)



Assumptions – GCLL (Darcy's Law)

- Same formula as previous slide, with the following values:
- k = 5E-10 cm/sec (this k value includes the laminate)
- T = 0.007 m
- H = same as before, 0 – 0.5 m
- Much of the leakage measured using ASTM D5887 with a laminate GCLL, such as Bentomat CL, is sidewall leakage and not leakage through the actual GCLL.
- Hence this k value may be conservative (i.e., a lower overall leakage rate is likely).
- For this reason, we also used Giroud's equation to evaluate leakage through the GCLL.

Assumptions – GCLL (Giroud)



$$Q = C_{qo}\left(1 + 0.1 \cdot \left(h/t_s\right)^{0.95}\right) a^{0.1} \cdot h^{0.9} \cdot k^{0.74}$$

where:

Q = flow through hole in geomembrane

$\boldsymbol{C_{qo}}$ = quality of intimate contact between GM/soil

(C_{qo} = 1.15 for poor contact and 0.21 for good contact)

h = liquid head on liner system (< 3 m)

$\boldsymbol{t_s}$ = thickness of soil beneath geomembrane

a = area of hole in geomembrane (circular, max diam 25 mm)

k = permeability of soil under geomembrane (constant)

See attached TR-258 for additional information on Giroud's equation.

Assumptions – GCLL (Giroud), Cont.

- Laminate is glued to the GCL, hence the contact coefficient (C_{qo}) will be good (0.21).
- h = similar to previous calculations, 0 – 0.5 m
- t_s = 0.007 m (thickness of low permeability bentonite/polymer clay)
- a = 1 cm^2, based on assumed defect diameter of 11 mm.

Typical for liner performance evaluation one defect per acre (4,000 m^2) is considered with a defect area of 0.1 cm^2 (equivalent to defect diameter of 3.5 mm), for a conservative design a defect area of 1 cm^2 (equivalent defect diameter of 11 mm) can be considered (Giroud et al., 1994).

Assumptions – GCLL (Giroud), Cont.

- k = 9.54E-9 cm/sec, based on measured k value of only the clay component with the site sea water.
- Assumed 10 installation defects per ha to be more conservative due to the thinner laminate thickness.
- Despite the increased number of assumed defects, the low permeability clay would help minimize leakage despite the increased defects.

Installation quality	Defect density (number acre)	Frequency (percent)
Excellent	Up to 1	10
Good	1 to 4	40
Fair	4 to 10	40
Poor	10 to 20*	10

Based on Help model (Schroeder et al., 1994).

Assumptions – HDPE GM (Giroud)

Same equation as previous slide, with the following variable modifications:

- C_{qo} will not be as good as that of the GCLL. The HDPE will not conform as well to the subgrade surface (wrinkles, non-uniform subgrade, etc). Assumed value is 1.15.
- h = similar to previous calculations, 0 – 0.5 m
- t_s = 10 m (assumed thickness of existing soil)
- a = 1 cm^2, based on assumed defect diameter of 11 mm.
- k = 1E-4 cm/sec, assuming a higher permeability soil on site.
- Assumed 2.5 installation defects per ha (1 defect per acre), which assumes good to excellent installation quality (from table on slide 7, based on Help model).

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April 26th, 2015

Title: Expected Service Life of Polymer Modified Geosynthetic Clay Liners

Introduction:
Synthetic water-soluble polymers have proven successful for various commercial applications such as rheological modifiers, flocculation aids, sealants for undersea cables, waterproofing, grouts, coatings, absorbents and lubricants, to name a few. CETCO employs such polymers as functional additives in geosynthetic clay liners such as Resistex, InterLoK and Continuum. It has been well studied that the geosynthetic materials (membranes, textiles, etc.) used in civil engineering applications must be formulated with proper levels and types of antioxidant/stabilizer/plasticizer packages. For example, a study on the degradation of high density polyethylene (HDPE) geomembranes indicated that, at ambient temperatures and steady oxygen supply, the service life of the HDPE geomembrane might be over 300 years.[1] The information included in this report, however, focuses on the anticipated longevity of the polymers used to modify CETCO geosynthetic clay liners (GCLs). Despite the fact that the polymers used to modify CETCO's GCL products are designed to be more stable than the polymers referenced in the cited literature, the cited literate can be used as an estimate of lifespan by analogy.

Background:
Since the early '90s there has been interest in determining the environmental fate of water swellable/soluble polymers due to their perceived recalcitrance (when deposited in landfills). Several studies have been done to understand the rate at which high molecular weight polymers breakdown on exposure to microbes. This report provides a review of major academic research findings that have been published to date. Several studies have investigated the breakdown of hydrophilic polymers in various disposal settings. These studies sought to determine the rate of mineralization of the polymer (conversion to CO_2 gas) or breakdown of the polymer crosslinks/chains producing smaller polymer chains or low molecular weight organic acids. Due to the relatively slow degradation rates of hydrophilic polymers and the presence of other degradable refuse (intentionally mixed-in to simulate real-world conditions), it was necessary to employ ultra-sensitive detection methods. The use of ^{14}C radiolabeled polymers allowed for accurate kinetic models in both aerobic and anaerobic conditions.

Anaerobic Degradation of High Molecular Weight Polymers:
The studies referenced herein set out to mimic the effects of various phases of biological activity in a landfill such as adjustment, transition, acid formation, methane fermentation and final maturation. These studies involved intentional inoculation of the polymer with microbes. It should be mentioned that other scenarios (such as mining applications for example) would be less aggressive, since the level of microbe activity would be less and the construction depth generally would be greater than the generally accepted anaerobic conditions that occur at a soil depth of 3 meters or less. The first comprehensive anaerobic degradation study was by Pohland et al., where a radiolabeled polymer was mixed with shredded municipal refuse.[2] In this study, the radiolabeled ^{14}C contents in the gas phase and leachates were monitored throughout the various stages of the simulated landfill life. Pohland found minimal amounts of degradation after the simulation reached final maturation. It

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was estimated that <3% of the total ^{14}C appeared in either the leachate or gas phases in the time up to 1250 days. After 1250 days, very little $^{14}CO_2$ evolution was observed over the next 250 days (the study was ended at 1500 days). A similar investigation was published by Stegmann et al. in which the degradation was studied in both anaerobic and aerobic conditions on diaper absorbent polymers.[3] These authors found that, in anaerobic conditions, >90% of the hydrophilic polymer remained localized in the waste, and only 2-4% of the polymer, most likely lower molecular weight components, appeared in the leachate. These tests showed that only 0.5% of the polymer degraded once the simulated landfill reached the methanogenic phase after which biodegradation was "essentially nil". The Stegmann and Pohland findings in anaerobic conditions were further supported in a study by Ress et al., where they found only 2.5% of the polymer was mineralized. In this study, the rate of degradation slowed considerably after 50 days and was negligible after 200 days.[3]

Aerobic Degradation of High Molecular Weight Polymers:
A separate study on aerobic degradation was done by Cook et al. [5] The Cook study concluded that after a 100 day composting period, only 8% degradation had occurred. Cook predicted the ensuing degradation rate would be approximately 0.007% per day (127 years to complete degradation). Since most waterproofing applications would be oxygen starved, any degradation occurring through bacterial or oxidation pathways would therefore occur at a much slower rate.

Conclusions:
The research indicates that high molecular weight water soluble polymers are slow to completely degrade in the environment. Anaerobic conditions (example: >3 meters of soil coverage) would result in much slower degradation rates, with an initial polymer degradation of 3-6% and negligible degradation thereafter. Based on this data, it is theorized that the longevity of the hydrophilic polymers in CETCO GCL products will be greater than 120 years. CETCO is currently planning more in-depth studies to understand the impact of various field conditions on the longevity of the products.

Sincerely,

Michael S Donovan, Ph.D.
Global R&D Director – Construction Technologies
CETCO / Minerals Technologies Corporation

References:

1) Jessberger, H.L., Heibrock, G., 1997. Development of a safety concept for landfill liner systems. In: August, H., Holzl.ohner, U., Meggyes, T. (Eds.), Advanced Landfill Liner Systems. Thomas Telford, London, UK, pp.101–109. London, UK, pp.101–109.
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3) Stegmann R.; Lotter, S.; King L.; Hopping W. *Waste Manag. Res.* 1993 11, 155.
4) Ress, B.; Calvert, P.; Barlaz, M. *Environ. Sci. Technol*. 1998, 32, 821-827.
5) Cook, B.; Bloom, P.; Halbach, T. *Journal of Environmental Quality* 1997, 26(3), 618-625.

Hydrologic performance of final covers containing GCLs

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ABSTRACT: Field performance data are examined for landfill final covers employing a barrier layer consisting of a conventional GCL, a laminated GCL (GCL with geofilm affixed), or a GCL composite (geomembrane over GCL). Data from covers relying solely on a conventional GCL indicate that the hydraulic conductivity of the GCL tends to increase over time, resulting in higher percolation rates than originally intended (covers with sodic soils are an exception). Percolation rates of 200-300 mm/yr are typical of covers relying on a conventional GCL in humid climates. Covers employing laminated GCLs and composite GCL-geomembrane barriers have low percolation rates (< 5 mm/yr). However, field performance data for covers with a composite GCL barrier are only available for arid regions. Samples of exhumed GCLs indicate that substantial increases in the hydraulic conductivity of conventional GCLs can occur if the native sodium in the bentonite is replaced by calcium or magnesium and the bentonite dehydrates. Use of a GCL as the sole hydraulic barrier layer in a cover is not recommended unless the overlying cover soils are sufficiently sodic. In contrast, covers employing a GCL overlain by a geomembrane or a GCL laminated with geofilm can be effective in limiting percolation to very small quantities regardless of the sodicity of the cover soil.

1 INTRODUCTION

Geosynthetic clay liners (GCLs) are used frequently as a hydraulic barrier layer in landfill final covers due to their thinness, ease of installation, and perceived resistance to environmental distress relative to barriers constructed with compacted clay. A variety of field studies have been conducted over the last decade in Europe and the USA to assess percolation rates characteristic of covers employing GCLs. Studies that have been published in the open literature are reviewed in this chapter. Recommendations regarding the use of GCLs in final covers are also

provided. Characteristics of the field sites are summarized in Table 1.

Table 1. Characteristics of sites where field performance of covers containing GCLs have been evaluated. NP = needle punched, SB = stitch bonded, CA = Ca bentonite, LNP = laminated needle punched.

Study	Location	Climate	Barrier Layer	Annual Precipitation (mm/yr)	GCL Type	Long Term Percolation Rate (mm/yr)
Melchior (2002)	Hamburg, Germany	Oceanic	Conventional GCL	620-750	NP	188
					SB	222
Wagner et al. (2002)	Esch-Belval, Luxembourg	Oceanic	Conventional GCL	713-1037		6.2
Henken-Mellis (2002)	Aurach, Germany	Continental	Conventional GCL	750	CA	14
Benson et al. (2007)	Wisconsin USA	Continental Humid	Conventional GCL	892	NP	299-450
			Laminated GCL		LNP	<5
Albright et al. (2004)	California, USA	Arid	GCL-geom. composite	112	NP	<0.1
	Boardman, USA	Semi-Arid	GCL-geom. composite	215	NP	0

2 COVERS RELYING SOLELY ON A GCL

2.1 *Georgswerder Study in Germany*

Melchior (2002) constructed two triangular lysimeters near Hamburg, Germany to evaluate percolation rates for covers employing a GCL as the barrier layer. Hamburg has a humid and seasonal climate with 600-750 mm of precipitation annually. Each lysimeter had an area of 100 m^2 and 8% slope. One lysimeter was used to test a needle-punched GCL (NP) containing natural sodium (Na) bentonite, and the other tested a stitch-bonded (SB) GCL containing Na-activated bentonite. The cover profile consisted of (top to bottom) 300 mm of loamy sand topsoil, the GCL, and 150 mm of sandy gravel, as depicted in Figure 1.

Annual percolation rates reported by Melchior (2002) are shown as a function of time in Figure 2. During the first year of operation, the percolation rate was less than 6 mm/yr for both lysimeters (< 1% of precipitation). After the first year, however, the percolation rate increased substantially, and ultimately reached 220 mm/yr for the NP GCL and 190 mm/yr for the SB GCL. The peak daily percolation rate was 15 mm/d for both lysimeters.

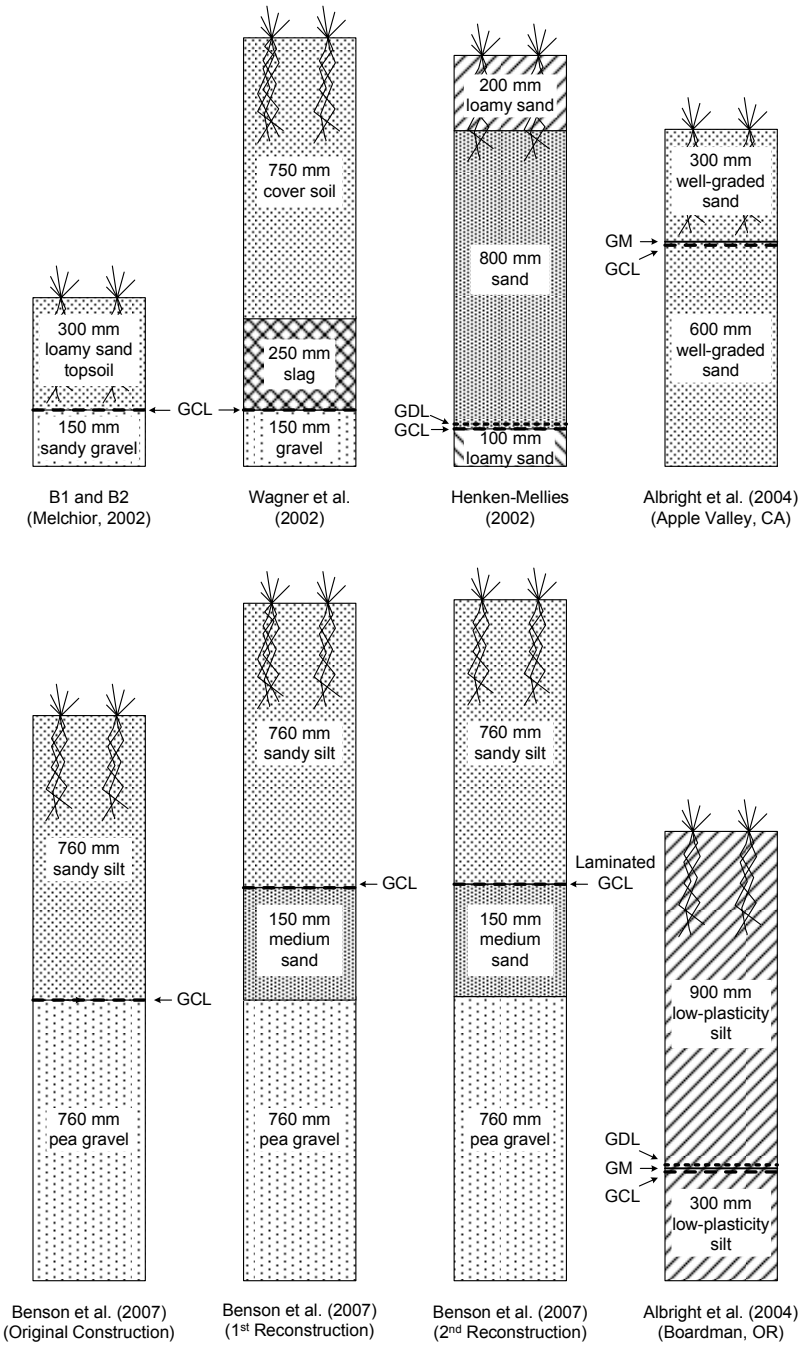


Figure 1. Profiles of final covers with GCLs evaluated in Europe and the USA. GCL = geosynthetic clay liner, GDL = geosynthetic drainage layer, GM = geomembrane.

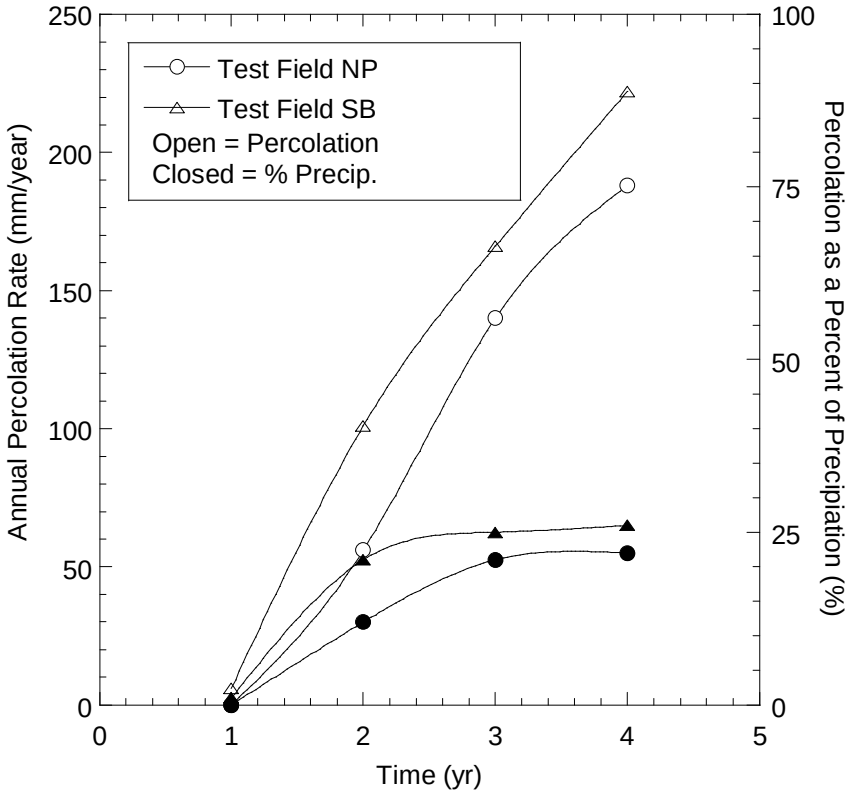


Figure. 2. Annual percolation rate and percolation as a percentage of precipitation from final covers with GCLs evaluated by Melchior (2002) in Hamburg, Germany.

For a GCL with a typical hydraulic conductivity of $2x10^{-9}$ cm/s, a percolation rate < 1 mm/yr is expected under saturated steady-state unit-gradient conditions. In contrast, a percolation rate of 15 mm/d corresponds to $1.7x10^{-5}$ cm/s under saturated steady-state unit-gradient conditions. Thus, the GCLs in both lysimeters had higher hydraulic conductivity than originally anticipated.

Exhumations were conducted periodically to determine if changes in the GCL were occurring. Within the first year, root penetrations and cracks in the bentonite were visible in both GCLs. By the end of the monitoring period, nearly all of the Na originally in the exchange complex of the bentonite was replaced by calcium (Ca) and magnesium (Mg), and the free swell of the bentonite was comparable to that of Ca bentonite rather than Na bentonite. Cation exchange was attributed to cations in water percolating downward through the cover soils and into the GCL. Hydraulic conductivity of GCLs exhumed at the end of the study ranged from 1.1×10^{-5} to 3.0×10^{-4} cm/s. This range is consistent with the hydraulic conductivity corresponding to the peak percolation rate measured in the field.

2.2 *Esch-Belval Study in Luxembourg*

Wagner et al. (2002) evaluated a needle-punched GCL containing Na bentonite as the barrier layer in a final cover profile at a blast furnace dust dump in Luxembourg, where the annual precipitation is 700-1100 mm/yr. The test section was located on a 5% slope and consisted of (top to bottom) a 750-mm-thick layer of cover soil, the GCL, and 250 mm of electric furnace slag (Fig. 1). A 3 m x 5 m pan lysimeter was used to collect percolation from the cover. Data were collected for 2 yr.

The annual percolation rate was 1.4 mm/yr in the first year and 6.2 mm/yr in the second year. These annual percolation rates correspond to hydraulic conductivities of 4×10^{-9} cm/s and 2×10^{-8} cm/s under steady-state unit-gradient conditions. Thus, the hydraulic conductivity of the GCL apparently increased during the first two years of study. However, samples of the GCL were not exhumed and thus the hydraulic conductivity of the GCL cannot be confirmed.

2.3 *Aurach Study in Germany*

Henken-Mellies et al. (2002) evaluated percolation rates from a test cover installed at a landfill in Aurach, Germany, where the average annual precipitation rate is 750 mm/yr. The cover employed a GCL containing Ca bentonite as the barrier layer and was composed of (top to bottom) 200 mm of loamy sand topsoil, 800 mm of sand, a geocomposite drainage layer, the GCL, and 300 mm of loamy sand (Fig. 1). The GCL had higher dry mass per unit area (9.5 kg/m^2) than is typical of GCLs containing Na bentonite (3.5-5.5 kg/m^2). Percolation from the test section was monitored for 3 yr, during which 14 mm of percolation (0.5% of precipitation) was recorded. No temporal pattern in percolation rate was observed, and the highest percolation rates occurred within the first 6 months after installation.

2.4 *Wisconsin Study in USA*

Benson et al. (2007) report percolation rates recorded in two pan lysimeters (4.3 x 4.9 m) installed beneath a cover containing a GCL used for closure of a coal ash landfill in Wisconsin, USA. The cover profile consisted of (top to bottom) 760 mm of sandy silt, the GCL, and 760 mm of pea gravel (Fig. 1). A non-reinforced GCL containing granular natural Na bentonite was employed. Percolation rates recorded in both lysimeters are shown in Figure 3.

Percolation rates in both lysimeters remained low (< 13 mm/year) for the first few months, but increased to as much as 299 mm/yr within the next 4-7 months. Consequently, the GCLs over both lysimeters were replaced. A 150-mm-thick layer of quartz sand was also installed as a buffer between the GCL and the underlying pea gravel to eliminate stress concentrations that might affect the GCL (Fig. 1). Percolation rates remained low for 9-15 months after reconstruction, but

then increased again to rates similar to those measured prior to replacing the GCL (Fig. 3).

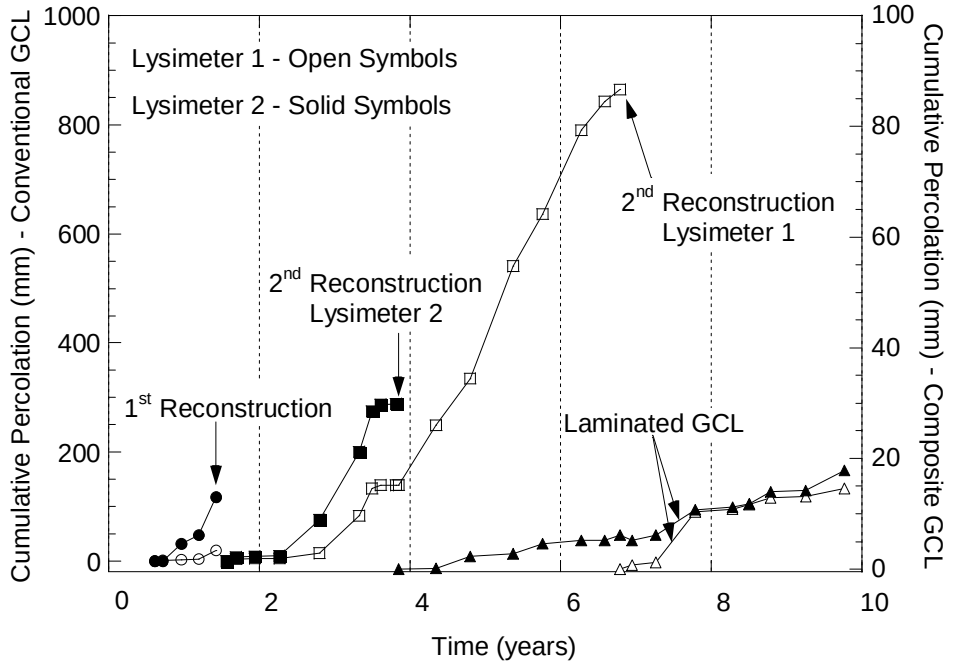


Figure. 3. Percolation rates recorded in lysimeters beneath a final cover employing a GCL in Wisconsin, USA. Left vertical ordinate is cumulative percolation through a conventional GCL system; right vertical ordinate is cumulative percolation through a laminated GCL system (adapted from Benson et. al. 2007).

GCL samples were collected from the field site during reconstruction activities to evaluate how the GCL had changed since installation. Hydraulic conductivity tests conducted on the exhumed GCLs confirmed that the hydraulic conductivity of the GCL had increased. The exhumed GCLs had hydraulic conductivities ranging between 1.4×10^{-6} and 9.1×10^{-5} cm/s, whereas tests on samples of new GCL had hydraulic conductivities ranging between 2.7×10^{-9} and 7.8×10^{-9} cm/s. The new GCL that was tested was the same type used in the original installation and the reconstruction.

Examination of the bentonite showed that nearly all of the Na originally in the exchange complex was replaced by Ca and Mg, and that the swell index of the bentonite was comparable to that of Ca bentonite. Benson et al. (2007) attributed the high percolation rates observed in the field (and the high hydraulic conductivity of the GCL) to the loss of swelling capacity incurred by replacement of Na by Ca and Mg coupled with dehydration of the bentonite. Shrinkage cracks that formed when the bentonite dried did not swell shut when the bentonite rehydrated, resulting in the high hydraulic conductivities. Cation exchange was attri-

buted to cations in water that percolated downward through the cover soils and into the GCL.

3 COVERS WITH A GCL-COMPOSITE BARRRIER

3.1 *Wisconsin Study in USA*

The GCLs in the field tests described by Benson et al. (2007) were replaced a second time after the percolation rates were found to be much higher than expected. The second reconstruction employed a GCL containing natural Na bentonite laminated with a 0.1-mm-thick polyethylene geofilm. The reconstruction was conducted in two phases. In the first phase, the laminated GCL was installed with the geofilm downward. The geofilm was oriented upward in the second phase. Otherwise the cover profiles were identical to those employed with the original GCL (Fig. 1).

Percolation rates for both orientations of the GCL are shown in Figure 4. Percolation rates remained low in both lysimeters after the laminated GCL was installed. The peak percolation rate was less than 18 mm/yr, and the average percolation rates were 2.6 and 4.1 mm/yr for the two lysimeters.

3.2 *California Study in USA*

A cover with a composite barrier layer consisting of a GCL overlain by a geomembrane was evaluated at a field site in Apple Valley, California, USA as part of the Alternative Cover Assessment Program (Albright et al. 2004). Apple Valley, California is an arid location, and receives 112 mm of precipitation annually (on average). Percolation from the cover was collected using a 10 m x 20 m pan lysimeter (Benson et al. 2001).

The cover profile consisted of (top to bottom) 300 mm of well-graded sand, a textured high-density polyethylene (HDPE) geomembrane, a needle-punched GCL containing Na bentonite, and 600 mm of well-graded sand (Fig. 1). An 11-mm-diameter hole was placed in the geomembrane near the center of the test area to simulate a construction defect. No percolation was transmitted by the cover during the first 1.5 yr of operation. After 5 yr, only 0.2 mm of cumulative percolation had been transmitted (Fig. 4).

The GCL was uncovered and samples were collected 5 yr after installation. No roots or desiccation cracks were present, indicating that the geomembrane was protecting the GCL. The geomembrane was covered with 300 mm of cover soil, which provided sufficient surcharge to maintain good contact between the geomembrane and the GCL. Hydraulic conductivity of the GCL samples ranged between 1.0×10^{-9} and 3.0×10^{-9} cm/s, which is typical of a new GCL (i.e., no change in hydraulic conductivity was observed). However, only 23% of the Na

originally in exchange complex remained when the GCLs were sampled, having been replaced by Ca and Mg. The replacement of Na by Ca and Mg was evident in the swell index of the bentonite (13.0-16.5 ml/2g), which fell between swell indices typical of Ca (6-10 mL/2 g) and Na bentonites (34-36 mL/2 g). Thus, the GCL was not immune to cation exchange, even though the GCL was overlain by a geomembrane. Melchior (2002) and Meer and Benson (2007) have reported similar observations for sites where a GCL was covered by a geomembrane. They suggest that upward migration of Ca and Mg from the underlying subgrade is responsible for cation exchange.

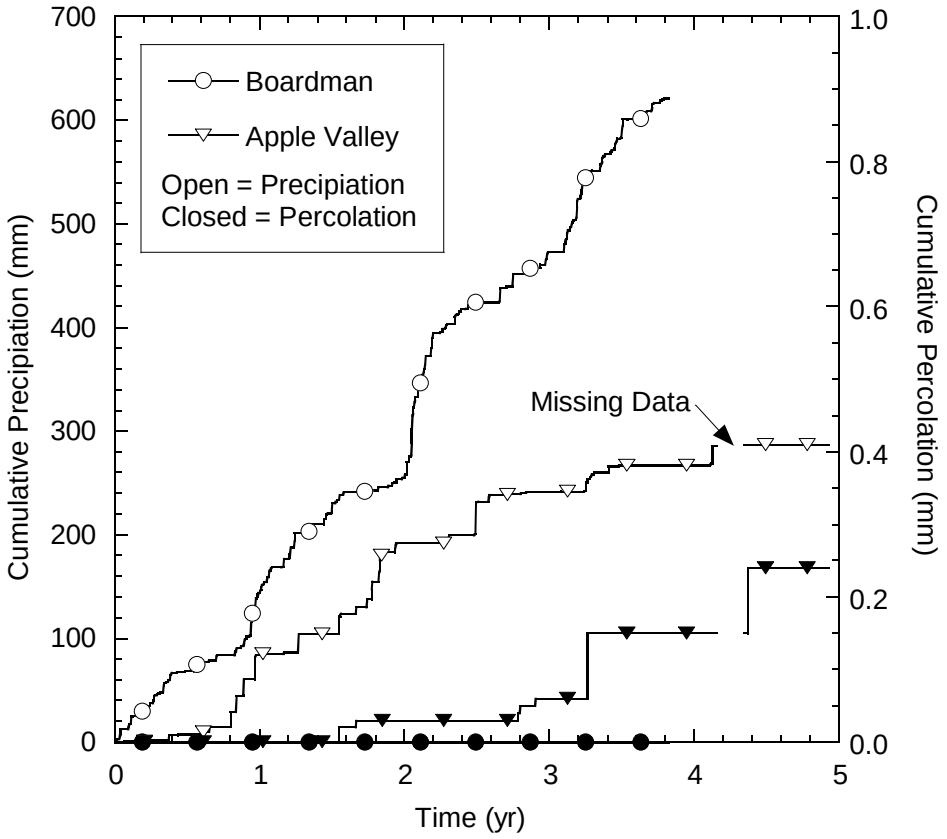


Figure. 4. Cumulative precipitation and percolation for final cover test sections with GCLS in Boardman, OR and Apple Valley, CA USA. Test sections at both sites had a composite GCL-geomembrane barrier layer.

3.3 *Oregon Study in USA*

A cover with a composite barrier layer consisting of a needle-punched GCL containing Na bentonite overlain by a textured HDPE geomembrane was evaluated at a field site in Boardman, Oregon, USA as part of the Alternative Cover Assess-

ment Program (Albright et al. 2004). Boardman, Oregon is semi-arid, with 215 mm of precipitation annually (on average).

The cover profile consisted of (top to bottom) a 900-mm-thick layer of low-plasticity silt, a geocomposite drainage layer, a textured HDPE geomembrane, the GCL, and 300 mm of low-plasticity silt (Fig. 1). An 11-mm-diameter hole was placed in the geomembrane near the center of the test area to simulate a construction defect. No percolation was transmitted from the cover over a 4-yr monitoring period (Fig. 4).

The GCL was uncovered and samples were collected 6.7 yr after installation. No roots were present in the GCL and hydration of the bentonite was modest. The bentonite still appeared granular and had relatively low water content (16-20%). The subgrade was also very dry at the time of the exhumation, which probably precluded significant hydration of the bentonite. Despite the lack of hydration and a dry subgrade, approximately % of Na originally in the exchange complex of the bentonite had been replaced by Ca and Mg, and the swell index of the bentonite (16.0-17.0 mL/2 g) was between swell indices typical of Ca and Na bentonites. As with the site in Apple Valley, CA, cation exchange at the Boardman site apparently was due to upward migration of divalent cations from the underlying subgrade.

Hydraulic conductivity of the exhumed GCLs was measured using two different permeant liquids: 0.01 M $CaCl_2$ solution (i.e., so called "standard water" that is stipulated in ASTM D 5084) and deionized (DI) water. When the Ca solution was used as the permeant liquid, the hydraulic conductivity of the exhumed GCLs ranged from 8.5×10^{-8} to 1.9×10^{-6} cm/s. In contrast, when DI water was used, the hydraulic conductivity was between 1.3×10^{-9} to 2.3×10^{-9} cm/s (i.e., in the range for a new GCL). This contrast in hydraulic conductivities suggests that a transition was occurring in the bentonite in response to cation exchange, with significantly higher hydraulic conductivities being realized when additional exchange occurred during permeation with the Ca solution. Similar behavior might have occurred in the field if additional Ca-for-Na exchange from the subgrade had continued.

4 PRACTICAL IMPLICATIONS

4.1 *Cation Exchange and Hydraulic Conductivity*

The evidence presented herein and by others has shown that cation exchange is common in GCLs used in covers regardless of whether they are covered with a geomembrane. The source of cations involved in exchange most likely is different for GCLs used without and with a geomembrane (i.e., cations eluted from overlying cover soils or cations migrating upward from the subgrade). However, the end result is the same: Na naturally in the bentonite is replaced by Ca (pri-

marily) and Mg. This Ca-for-Na exchange can (but does not always) result in a large increase in hydraulic conductivity. GCLs that hydrate and then undergo exchange, but do not dehydrate, appear to maintain low hydraulic conductivity (e.g., Apple Valley, CA site). In contrast, GCLs that hydrate and undergo exchange and then dehydrate (e.g., Georgswerder Germany study, Wisconsin USA study) or GCLs that undergo exchange without significant hydration (Oregon USA study) can become very permeable. This suggests that GCLs should be installed under conditions that promote rapid hydration and prevent dehydration. Conditions that preclude or minimize cation exchange should also be selected if practical.

4.2 *Promoting Hydration and Preventing Dehydration*

The most practical means to promote hydration is to place the GCL on a moist compacted subgrade. In general, GCLs placed on a subgrade prepared at optimum water content (or wetter) will be fully hydrated within 60-90 d (USEPA 1996, Bradshaw 2008), with greater hydration occurring when the water content of the subgrade is wet of optimum water content (EPA 1996). Hydration can also be achieved by direct wetting of the GCL after placement, but this practice can result in construction difficulties and displacement of bentonite within the GCL when overlying geosynthetics and cover soils are placed. GCLs that are prehydrated in the factory are also available (e.g., Kolstad et al. 2004a), but they tend to be more costly than conventional GCLs.

The only effective means currently available to prevent dehydration of GCLs is to cover the GCL with a geomembrane or to use a laminated GCL with the geofilm oriented upward. For GCLs covered with a geomembrane, placing cover soil over the geomembrane is particularly important. Surcharge provided by the cover soil ensures good contact between the geomembrane and GCL. Without good contact, dehydration of the bentonite can occur as moisture migrates upward and evaporates into the space between the geomembrane and GCL. For this reason, cover soil should be placed on the geomembrane as soon as practical.

This strategy to prevent dehydration effectively implies that GCLs used in final covers should be part of a composite barrier (geomembrane over GCL or GCL laminated with a geofilm). As illustrated earlier, the field performance of final covers with GCL composite barriers is excellent. Percolation rates less than 1 mm/yr are typical in arid regions, and percolation rates less than 5 mm/yr have been recorded for laminated GCLs in humid climates. Even lower percolation rates are anticipated in humid regions for GCLs overlain by geomembranes, but field data for such covers are not available.

4.3 *Conditions Precluding Cation Exchange and Increases in Hydraulic Conductivity*

Cation exchange can be precluded or limited to acceptable levels if the cover soils are sufficiently sodic. For example, Mansour (2001) describes a case history at a semi-arid site in California where a GCL was deployed in a final cover with sodic cover soils. After 5 yr of service, the GCL was exhumed and evaluated. The average hydraulic conductivity of the exhumed GCL was 1.9×10^{-9} cm/s and the swell index was characteristic of Na bentonite.

Benson and Meer (2008) describe a series of experiments that were conducted to determine how the relative abundance of monovalent and divalent cations in water contacting a GCL affects cation exchange, bentonite swell, and the hydraulic conductivity. The intent was to identify pore water conditions conducive to maintaining low hydraulic conductivity in the presence of wetting and drying. GCL specimens were subjected to cyclic wetting and drying, with wetting accomplished via permeation with salt solutions prepared using various proportions of NaCl and $CaCl_2$. Relative abundance of monovalent and divalent cations in water permeating the GCL was quantified using RMD (Kolstad et al. 2004b):

$$\text{RMD} = \frac{M_m}{\sqrt{M_d}} \tag{1}$$

where M_m is the total molarity of monovalent cations in the pore water and M_d is the total molarity of divalent cations in the pore water.

Results of hydraulic conductivity tests by Meer and Benson (2007) are shown in Figure 5. The hydraulic conductivity after wet-dry cycling was strongly related to the RMD of the permeant solution, with lower hydraulic conductivity obtained as the sodicity of the solution increased (i.e., higher RMD). Moreover, when RMD of the permeant solution was at least 0.15 $M^{0.5}$, only a small increase in hydraulic conductivity was observed. Low hydraulic conductivity was maintained at high RMD because less Na was replaced by Ca (Fig. 6). As a result, the swelling capacity of the bentonite was retained, which permitted desiccation cracks in the bentonite to swell shut during rehydration.

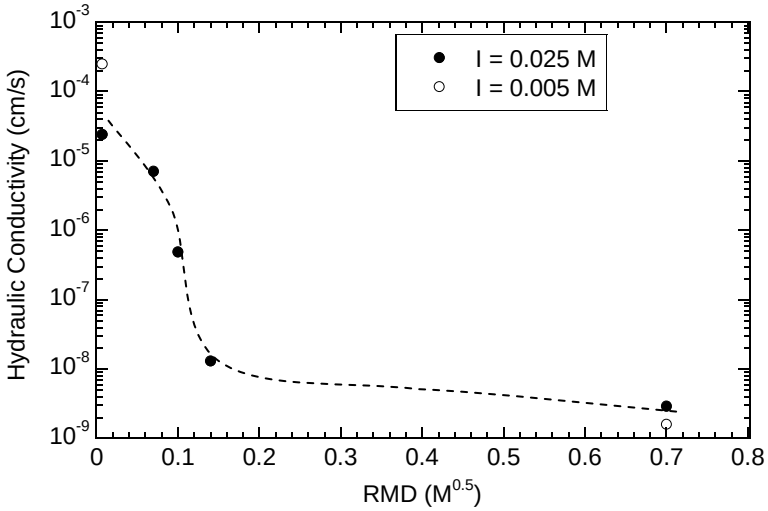


Figure. 5. Equilibrium hydraulic conductivity of GCLs subjected to cyclic wetting and drying using permeant solutions with different RMD and two ionic strengths (I) (adapted from Benson and Meer 2008).

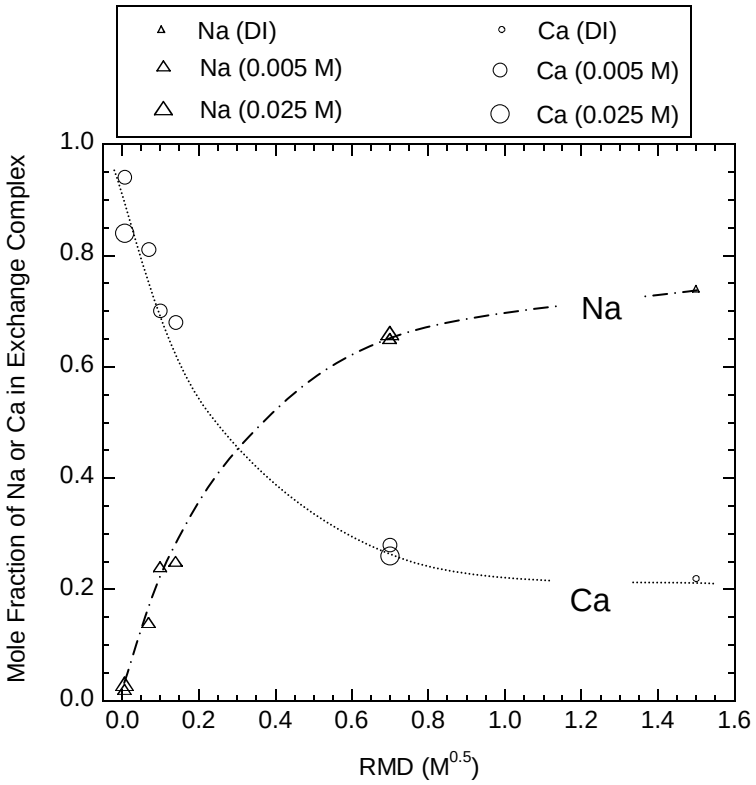


Figure. 6. Mole fractions of Na and Ca in the exchange complex of GCLs subjected to cyclic wetting and drying using permeant solutions with different RMD and two ionic strengths (I). Control tests conducted with DI water. Graph adapted from Benson and Meer (2008).

4.4 *Recommended Usage of GCLs in Final Covers*

Based on the observations that have been reported, the following recommendations are made regarding the use of GCLs in final covers:

- GCLs should not be used in final covers without an overlying geomembrane or geofilm unless the RMD of the pore water in the cover soil is at least 0.15 $M^{0.5}$. RMD of the pore water can be assessed using ASTM D 6141.

- When covering a GCL with a geomembrane, the overlying cover soil should be placed as soon as possible after deployment of the geomembrane. The cover soil provides a surcharge that ensures good contact between the geomembrane and GCL, thereby limiting the potential for dehydration of the bentonite.

- GCLs should be placed on a moist subgrade to promote rapid hydration of the bentonite. More rapid hydration occurs when the water content of the subgrade is at optimum water content or higher.

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A Review of Key Factors on Geosynthetic Clay Liners' Performance as Liner System

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***Abstract*—** Geosynthetic clay liners (GCLs) as a substitute material to compacted clay liner (CCLs) can be employed as landfill leachate barriers, waste water impoundments and any other liquid impediments. They have some advantages in their shape, availability, easy in installation and mainly hydraulic performance. However, the hydraulic performance of GCLs as liquid barricade depends on some factors. In this paper, a review of some key factors that affected the GCLs performance as leachate and liquid barrier will be presented and discussed in order to provide a critical view of GCLs behavior.

***Keywords* —** GCLs, hydration, internal-erosion, self-healing.

I. Introduction

MORE than decades, geosynthetic clay liners (GCLs) have extensively been accepted to substitute compacted clay liners (CCLs) since they have more benefits over CCLs specifically their hydraulic ability, availability, transport and construction cost. GCLs can be in form of a composite liner that consist of a thin layer of bentonite and two geosynthetic layers. The geosynthetic layers used are generally geotextiles [1], [2]. The bentonite which can be in powder or granular form is laid over carrier geotextiles and beneath cover geotextile. The type carrier and cover geotextile can be all woven, non woven and combination of woven and nonwoven which depend on the purposes. Some of GCLs may be reinforced by needle-punching, adhesive bonding and combined with thermal bonding in their production. The thin layers of bentonite in GCLs are more impermeable toward water compared to the CCLs [1], [2] and the GCLs have been used layering them with geomembrane to form a composite liner system at the base of sanitary landfills, and many other liquid containment purposes in some developed countries [3]-[6].

In order to perform as leachate or liquid barriers, some key factors such as hydration, internal erosion and self healing are significantly affecting the hydraulic conductivity performance of GCLs. Thus, to get a clear picture, some researches on those entire factors that have been conducted in the previous years will be discussed in this paper.

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II. Hydration of GCLs

The ability of the GCLs to reach their maximum hydraulic performance depends on their degree of saturation. GCLs must be sufficiently hydrated typically using water to function as a liner system for an impediment for any liquid contaminant [4]. After being hydrated, the bentonite particles will swell and attach to each other. The hydration process of the GCLs can take place immediately after the GCLs are being placed on underlying subgrade which contains water such as soil. Watering the GCLs is not required as long as the subgrade has adequate moisture content. During the hydration process, the GCL will absorb the water from the subgrade, swell and make the GCLs water impermeable.

The hydration process of GCLs has been investigated extensively by placing the GCL on some different subgrade such as sand which contains different level of moisture content. It was reported by Daniel *et al.* [7] that the GCLs could absorb more than 80% of the water from their subgrade after being laid for less than 2 months. Unfortunately, the moisture content of the subgrade during and after hydration process was not reported. Additionally, the precipitation and humidity factors which were suspected to have significant influence on the hydration rate also have not been mentioned on the report.

Anderson, Rayhani, and Rowe [8] investigated the GCLs hydration phase by placing the GCLs on the sand subgrade which has about 8-10% moisture content. The result showed that the rate of hydration process was relatively fast. The GCLs took up 100% of moisture content in less than 24 hours and absorbed 140% after being placed for 60 days. In addition, Rayhani *et al*. [9] also believed that the method of GCLs' bonding during production which are needle-punching, adhesive bonding and or combined with thermal bonding also have an influence on the hydration process of GCLs. The type of bentonite also has been reported to contribute toward hydration process of the GCls [10]. Regrettably, the moisture content of the subgrade, precipitation and humidity level during the experiment was not conveyed in all reports.

Rayhani *et al*. [9] suggested that the subsoil grain size distribution and initial moisture content also contributed to the degree and rate of hydration. They also investigated the GCls' hydration under isothermal condition at room temperature and

it was found that the rate of GCL hydration was slightly lower when silty sand was used as a subsoil compared to sand. Meanwhile, Anderson, Rayhani, and Rowe [8] stated that when the GCLs were placed on a sand subgrade and confining pressure was applied on the sample, the water content balance of the GCL decreased corresponding to the increasing of the confining pressure.

During construction, the GCLs are potentially exposed to the open air or direct sunlight which causes the GCLs encounter daily thermal cycle. Since the previous studies did not mention any daily thermal cycle, nevertheless, Rowe, Bostwick, and Take [11] found that daily sun exposure also considerably contributes to the hydration of the GCLs while resting on silty sand and sand subsoil. In order to minimize the effect of daily thermal cycle, it was recommended to shield the GCL using a protection layer or soil cover after installation. However, all previous studies on GCLs' hydration have not considered yet the impact of protection layer or soil cover that can be significantly affect the internal temperature of GCLs, moisture content and hydration process during daily thermal cycles.

III. Internal Erosion of GCLs

GCLs have the potential to exhibit internal erosion when confronted with large hydraulic gradient that is caused by leachate or liquid that collects above the liner during their application as composite liner system for a landfill or the sole liner for a pond and lagoon. The loss of bentonite particles that separate from each other and are moved away by the flowing water may reduce the GCLs performance and augment their hydraulic conductivity. According to Stark [12], bentonite migration could also occur in a non-uniform normal stress zone. This zone is generally developed by GCL's wrinkles and resulting to a space under the GCLs. This would lead the bentonite migrating into the unsupported space under the wrinkles. Moreover, Fox [13] found that dynamic loading caused by movement by heavy equipment like a bulldozer on a lesser soil cover depth could also significantly damage the GCLs after installation. Fox, De Battista, and Mast [14] also believed that increasing cover soil particle size and rate of loading will increase the amount of bentonite migration in GCLs. However, all those previous research did not consider the effect of subgrade on the performance of GCLs toward internal erosion.

Rowe and Orsini [15] conducted research on internal erosion occurrence of some types of GCL that were laid on three different subgrades (gravel, geonet and sand) and posed by high hydraulic gradient. They reported that high hydraulic gradient could trigger an internal erosion of GCLs when placed over gravel or geonet. Meanwhile, there was no indication of internal erosion of the GCLs placed on sand subgrade even when an extreme gradient was applied during the experiment. It has also been reported that a scrim-reinforced nonwoven geotextile carrier layer has a better hydraulic performance than a single light-weight (woven or nonwoven) geotextile carrier [15]. However, it has not yet been considered if an additional protection layer such as soil or gravel spread on the GCLs could have any effects on the GCLs.

Dickinson and Brachman [17] believed that the GCL was much more susceptible to failure from internal erosion when a geotextile protection layer was installed above the GCL. This would allow the large head to act on the thinnest part of the GCL as a result of the increased transmissivity between the gravel and GCLs. On the other hand, Stark, Choi, and Akhtarshad [16] suggested using compacted clay liner sandwiching the bentonite between two geomembrane to diminish the occurrence of internal erosion. This is because the clay liner will reduce the amount of hydration, stress concentration and make the geometry of the site smoother.

However, all the suggestions made above can be implemented but the previous experiments have been conducted under the specific conditions and materials; consequently, an experimental verification should be carried out for specific design purposes in different conditions that could be vary in each site.

IV. Self Healing of GCLs

During its application as landfill liner, GCLs may deal with some situations which possibly trigger the damage of the GCLs and reduce their sealing performance. The thickness of GCLs is subjected toward static pressures that causes GCLs thinning non-uniformly. Sharp materials might puncture the GCLs and reduce the capability of the GCLs as liquid barriers. Anderson *et al.* [18] investigated the self-healing properties of bentonite during rehydration by creating some artificial holes and reported that the bentonite could seal up a hole up to 25 mm but failed to fill the 75 mm hole. According to Sivakumar Babu et al. [19], it only needs 15 days to seal up a hole measuring 30 mm in diameter but the durability of the recovered area was limited. It could only hold up water of no more than 1 m of the hydraulic head. Shan and Lai [18] did not mention in detail of any physical changes during the rehydration process, but the previous researchers indicated that the self healing process happened during rehydrated period of GCL.

Sivakumar Babu *et al*. [19] conducted another experiment to investigate the self-healing capacity with desiccation cracks or punctures of the GCLs for the case. The test also considered the influence of temperature, swell percentage, swell pressure and also void ratio. This experiment was undertaken since Shan and Lai [18] stated that swell percentage tests or direct measurements of hydraulic conductivity or permittivity were helpful to assess the self healing capacity of GCLs. The results showed that the tested GCLs have good self-healing properties. It was also claimed that the method of binding the GCL components, i.e., stitch-bonding or needle-punching, had a significant influence on the self healing of the GCLs. Again, Sivakumar Babu *et al*. [19] also did not discuss any changes in the appearance of the crack or puncture areas during the self healing process. The permittivity test was also conducted after the swelling phase and self healing of the GCLs. GCLs have also been able to seal a gap when a solid object is inserted into the GCLs without having any effect on its hydraulic

performance.

It is quite clear that the GCLs have an ability of self healing once they are punctured or get any cracks. In addition, needle-punched and stitch-bonded GCLs had a better self healing performance than other binding method of GCLs such as adhesive bonding. Whereas, the previous research did not try to look at any possibilities of the GCL's self healing performance when the water or liquid still passed the holes.

V. SUMMARY

It can be summarized that the performance of GCLs relies on some factors which are hydration, internal erosion occurrence and self healing. The hydration of GCLs can begin immediately after the GCLs are being laid on the subgrade with certain moisture content. It has also been recommended that a protection layer such as soil should be applied to minimize the effect of daily thermal cycle that might be influence the hydration process. Regarding the internal erosion, some researchers believed that the type of subgrade contributed significantly toward occurrence of internal erosion. It has been investigated that the sand subgrade can perform better in preventing the GCLs from bentonite migration even when under an excessive hydraulic gradient. Lastly, the previous researches have proven the ability of the GCL to conduct self recovery when a number of holes of different diameters up to 30 mm in diameter were created in the sample although the durability of the recovered area was limited. Additionally, the GCLs could seal up a gap completely when a solid objected was punched into the sample without any rise in hydraulic conductivity. Nevertheless, the self healing performance of GCLs towards any puncture or defects during continuous the flow is still being questioned since all the previous experiments have only shown that the recovery process were took placed during the rehydration phase.

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EQUATIONS FOR CALCULATING THE LEAKAGE THROUGH COMPOSITE LINERS

The attached paper presents empirical equations for calculating the expected rate of liquid flow through composite liners due to geomembrane defects. Equations are provided that are applicable to composite liners containing either compacted clay liners (CCLs) or geosynthetic clay liners (GCLs). Note in the equations that a key parameter to leakage through geomembrane defects in composite liners is the hydraulic conductivity of the underlying clay liner. Thus, if the hydraulic conductivity of a GCL is less than that of a CCL, then the leakage through the composite liner will be less using a GCL instead of a CCL.

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Technical Paper by J.P. Giroud

EQUATIONS FOR CALCULATING THE RATE OF LIQUID MIGRATION THROUGH COMPOSITE LINERS DUE TO GEOMEMBRANE DEFECTS

ABSTRACT: Equations available to date for calculating the rate of liquid migration through a composite liner due to geomembrane defects require the use of graphs to obtain the value of one of the terms of the equations for the case where the liquid head is larger than the thickness of the low-permeability soil component of the composite liner. In this paper, it is shown that the terms that require graphs can be expressed analytically, which leads to a new set of equations that provides an entirely analytical means of calculating the rate of liquid migration through composite liners. This new set of equations is particularly useful when the liquid head is large compared to the thickness of the low-permeability soil component of the composite liner, which is often the case when the low-permeability soil associated with the geomembrane to form a composite liner is a geosynthetic clay liner. A numerical example is given.

KEYWORDS: Liquid migration, Leachate migration, Leakage, Composite liner, Equations.

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1 INTRODUCTION

1.1 Purpose of this Paper

Equations are available to calculate the rate of liquid migration through a composite liner, due to geomembrane defects, when the liquid head on top of the liner is small compared to the thickness of the low-permeability soil component of the composite liner, whether the defect is small (Giroud et al. 1989) or large (Giroud et al. 1992). Equations are also available for the case where the head of liquid on top of the liner is large compared to the thickness of the low-permeability soil component of the composite liner (Giroud et al. 1992,1994); however, in such a case, graphs are necessary to obtain the value of one of the terms of the equations, which is cumbersome.

In this paper, it is shown that the graphs can be replaced by equations, which leads to an entirely analytical method for the evaluation of the rate of leachate migration through a composite liner, regardless of the head of liquid on top of the liner.

1.2 Composite Liner

A composite liner is a liner that consists of two or more components. In the context of this paper, the term composite liner will be used for liners that consist of two components, a geomembrane and a low-permeability soil, the geomembrane being on top of the low-permeability soil.

The low-permeability soil component of a composite liner is generally either a compacted clay liner (CCL) or a geosynthetic clay liner (GCL). The thickness of a CCL is typically between 0.3 and 1.5 m whereas the thickness of a hydrated GCL depends on the compressive stress applied during hydration and is typically between 5 and 10 mm, i.e. on the order of 100 times less than the thickness of a CCL. The hydraulic conductivity of both CCLs and GCLs depends on the nature of the material, the nature of the liquid, and the applied compressive stress; when the liquid is water or a leachate that does not affect the hydraulic conductivity of clay, including bentonite, the hydraulic conductivity of a CCL is typically between 1×10^{-10} and 1×10^{-9} m/s whereas the hydraulic conductivity of a GCL is typically between 5×10^{-12} and 5×10^{-11} m/s, i.e. on the order of 10 to 100 times less than the hydraulic conductivity of a CCL.

1.3 Liquid Migration Through a Composite Liner

Since an intact geomembrane has an extremely low permeability, most of the liquid migration through a composite liner occurs through geomembrane defects. In this paper, the only mechanism of liquid migration that is considered is flow through geomembrane defects. The liquid considered herein is water or any aqueous solution such as leachate from municipal or hazardous solid waste landfills.

If there is a defect in the geomembrane component of a composite liner, the liquid passes first through the geomembrane defect, then it flows laterally some distance between the geomembrane and the low-permeability soil, and, finally it infiltrates into and through the low-permeability soil layer which is the second component of the composite liner (Figure 1). Flow in the space between the geomembrane and the low-perme-

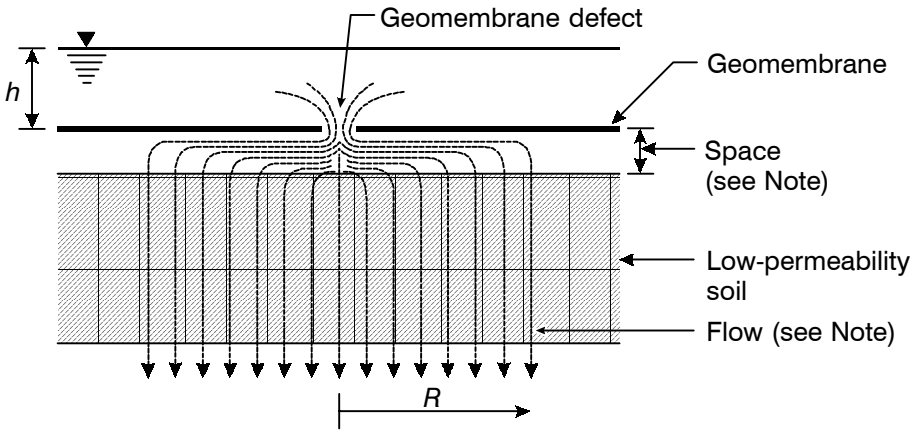


Figure 1. Liquid migration through a composite liner.

Note: The space between the geomembrane and the low-permeability soil is exaggerated to show interface flow. The flow in the soil is assumed to be vertical and *R* is the radius of the wetted area.

ability soil is called interface flow, and the area covered by the interface flow is called the wetted area.

The quality of the contact between the two components of a composite liner (i.e. the geomembrane and the low-permeability soil) is one of the key factors governing the rate of flow through the composite liner, because it governs the radius of the wetted area (Figure 1). *Good* and *poor* contact conditions have been defined by Bonaparte et al. (1989) as follows:

- *Good* contact conditions correspond to a geomembrane installed, with as few wrinkles as possible, on top of a low-permeability soil layer that has been adequately compacted and has a smooth surface.
- *Poor* contact conditions correspond to a geomembrane that has been installed with a certain number of wrinkles, and/or placed on a low-permeability soil that has not been well compacted and does not appear smooth.

For good contact conditions, it is assumed that there is sufficient compressive stress to maintain the geomembrane in contact with the low-permeability soil layer. In the case of a GCL, good contact conditions may be assumed because GCLs are usually installed flat, and because the bentonite slurry that may exude from a hydrated GCL contributes to establishing a close contact between the geomembrane and the GCL, provided sufficient compressive stress is applied.

Other factors affecting the rate of flow through a composite liner are the size of the defect, the hydraulic conductivity of the low-permeability soil underlying the geomembrane, and the head of liquid on top of the geomembrane. If hydrostatic conditions prevail, the head of liquid on top of the geomembrane is equal to the depth of liquid (Figure 2a) and, if the liquid is unconfined and flowing along a slope (Figure 2b), the head of liquid on top of the geomembrane, *h*, is given by the following equation:

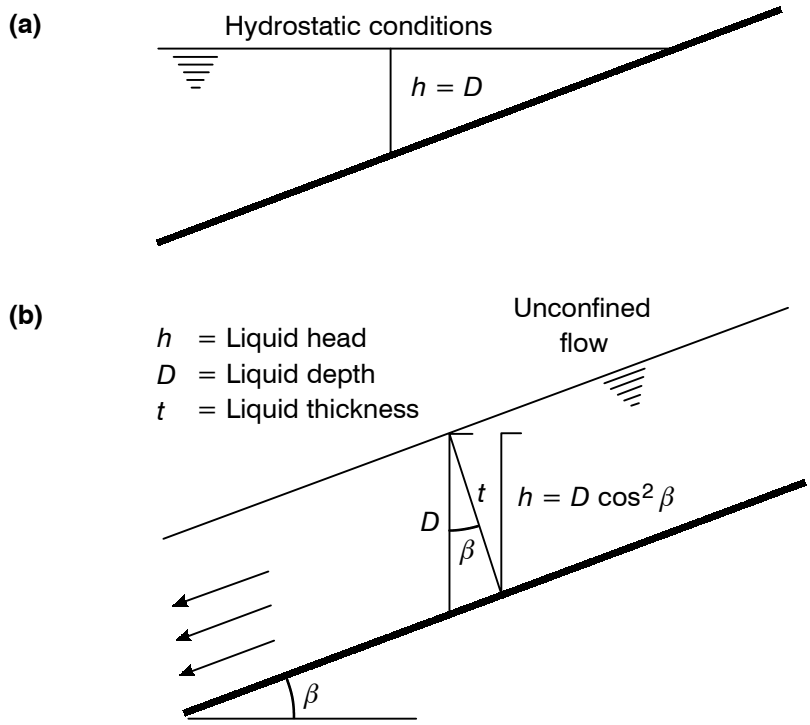


Figure 2. Head of liquid on top of the liner in the case of a liner on a slope: (a) hydrostatic conditions; (b) unconfined flow along the slope.

$$h = t \cos \beta = D \cos^2 \beta \qquad (1)$$

where: t = thickness of liquid; D = depth of liquid; and β = slope angle.

1.4 Geomembrane Defects

The following defect shapes are considered in this paper (Figure 3a):

- circular, with a surface area, a, and a diameter, d;
- square, with a side length, b;
- rectangular, with a length, B, and a width, b; and
- infinitely long ($B = \infty$) with a width, b.

1.5 Parameters and Units

The parameters that appear in the liquid migration rate equations are defined in Figure 3b. In the case of a liner on a slope, the liquid head, h, is defined in Figure 2 and by Equation 1.

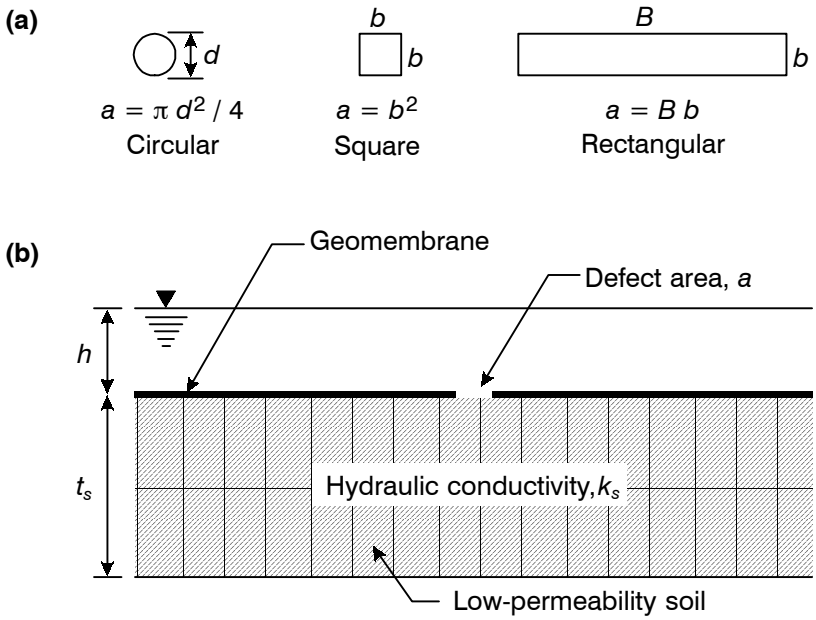


Figure 3. Definition of parameters used in the equations: (a) plan view showing shapes of geomembrane defects; (b) cross section.

Note: If the composite liner is on a slope, the liquid head on top of the liner is defined in Figure 2.

In the equations that follow, Q is the rate of liquid migration through the geomembrane defect. When the defect has an infinite length, the equation gives Q^*, which is the liquid migration rate per unit length of geomembrane defect.

It is important to note that the equations for liquid migration rate that follow are semi-empirical and can only be used with the following basic SI units: h (m), t_s (m), B (m), b (m), a (m^2), k_s (m/s), Q (m^3/s), and Q^* (m^2/s). (Note: t_s = thickness of the low-permeability soil component of the composite liner; k_s = hydraulic conductivity of the low-permeability soil component of the composite liner; and all other symbols were defined above.)

2 EXISTING EQUATIONS TO CALCULATE THE RATE OF LIQUID MIGRATION THROUGH COMPOSITE LINERS

2.1 Equations for Small Head

The following equations have been proposed for the case where the head of liquid on top of the liner is less than the thickness of the low-permeability soil component of the composite liner.

Case of a Circular Defect. In the case of a circular defect, the following equation has been established by Giroud et al. (1989):

$$Q = C_{qo} \; a^{0.1} \; h^{0.9} \; k_s^{0.74} \tag{2}$$

hence:

$$Q = 0.976 \, C_{qo} \; d^{0.2} \, h^{0.9} \, k_s^{0.74} \tag{3}$$

where C_{qo} is the contact quality factor (dimensionless) for a circular or square hole, with:

$$C_{qogood} \leq C_{qo} \leq C_{qopoor} \tag{4}$$

where: C_{qogood} = value of C_{qo} in the case of good contact conditions; and C_{qopoor} = value of C_{qo} in the case of poor contact conditions. (The good and poor contact conditions were defined in Section 1.3.) The following values were established by Giroud et al. (1989):

$$C_{qogood} = 0.21 \tag{5}$$

$$C_{qopoor} = 1.15 \tag{6}$$

Case of a Square Defect. In the case of a square defect, the following equation has been established by Giroud et al. (1992):

$$Q = C_{qo} \; b^{0.2} \; h^{0.9} \; k_s^{0.74} \tag{7}$$

In this case, the value of C_{qo} is the same as in the case of a circular defect discussed above.

Case of a Defect of Infinite Length. In the case of a defect of infinite length ($B = \infty$ in Figure 3a), the following equation has been established by Giroud et al. (1992):

$$Q^* = C_{q\infty} \; b^{0.1} \; h^{0.45} \; k_s^{0.87} \tag{8}$$

where $C_{q\infty}$ is the contact quality factor (dimensionless) for a defect of infinite length, with:

$$C_{q\infty \, good} \leq C_{q\infty} \leq C_{q\infty \, poor} \tag{9}$$

where: $C_{q\infty\,good}$ = value of $C_{q\infty}$ in the case of good contact conditions; and $C_{q\infty\,poor}$ = value of $C_{q\infty}$ in the case of poor contact conditions. The following values were established by Giroud et al. (1992):

$$C_{q\infty\,good} = 0.52 \tag{10}$$

$$C_{q\infty\,poor} = 1.22 \tag{11}$$

Case of a Rectangular Defect. In the case of a rectangular defect, the following equation has been established by Giroud et al. (1992):

$$Q = C_{qo}\ b^{0.2}\ h^{0.9}\ k_s^{0.74} + C_{q\infty}(B-b)\ b^{0.1}\ h^{0.45}\ k_s^{0.87} \tag{12}$$

where C_{qo} and $C_{q\infty}$ have the values defined above.

2.2 Equations for Large Head

When the head of liquid on top of the liner is greater than the thickness of the low-permeability soil component of the composite liner, Equations 2, 3, 7, 8 and 12 are not valid. Instead, the following equations should be used, as shown by Giroud et al. (1992):

- Circular defect:

$$Q = C_{qo}\ i_{avgo}\ a^{0.1}\ h^{0.9}\ k_s^{0.74} \tag{13}$$

- Square defect:

$$Q = C_{qo}\ i_{avgo}\ a^{0.2}\ h^{0.9}\ k_s^{0.74} \tag{14}$$

- Infinitely long defect:

$$Q^* = C_{q\infty}\ i_{avg\infty}\ b^{0.1}\ h^{0.45}\ k_s^{0.87} \tag{15}$$

- Rectangular defect:

$$Q = C_{qo}\ i_{avgo}\ b^{0.2}\ h^{0.9}\ k_s^{0.74} + C_{q\infty}\ i_{avg\infty}\ (B-b)\ b^{0.1}\ h^{0.45}\ k_s^{0.87} \tag{16}$$

where: i_{avgo} = average hydraulic gradient in the low-permeability soil in the case of a circular or square defect; and $i_{avg\infty}$ = average hydraulic gradient in the low-permeability soil in the case of a defect of infinite length. The values of i_{avgo} and $i_{avg\infty}$ are given in the graphs presented in Figure 4.

It appears that, when the head of liquid is greater than the thickness of the low-permeability soil component of the composite liner, the calculation of the rate of liquid migra-

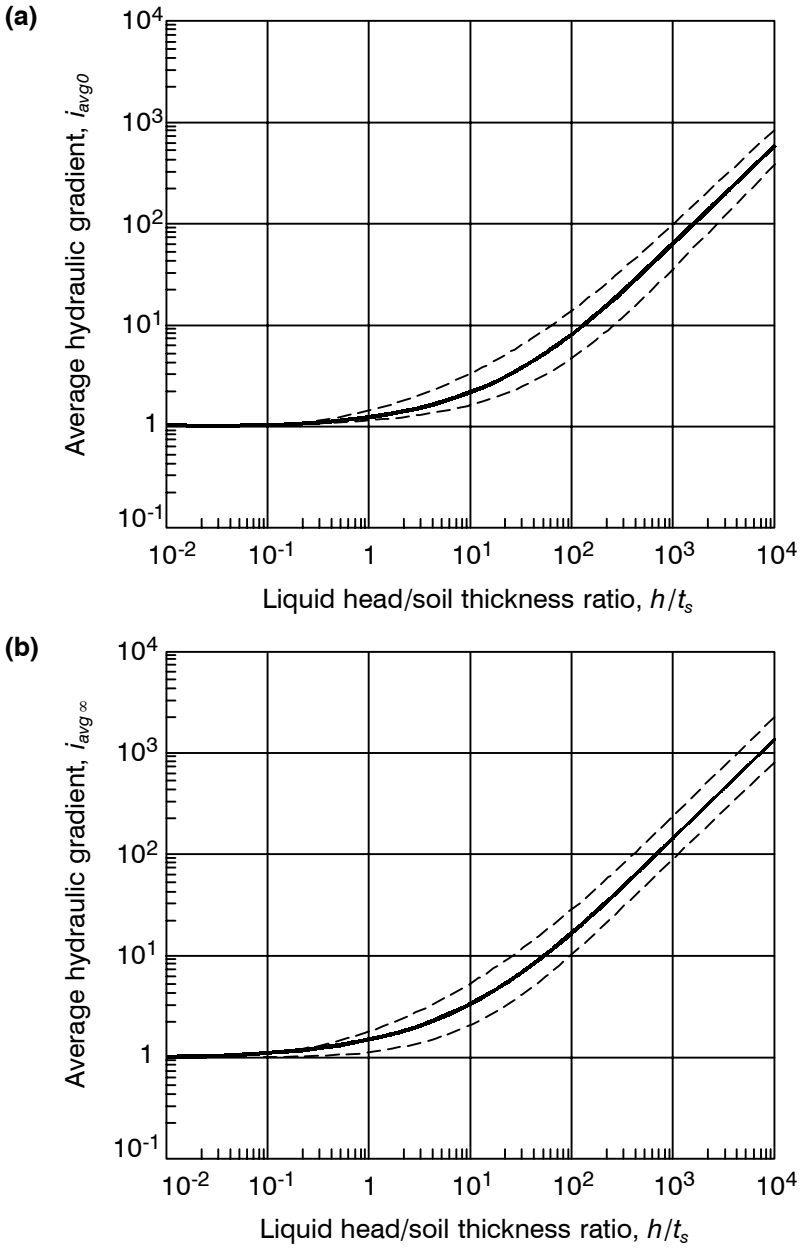


Figure 4. Values of the average hydraulic gradient to be used in equations for liquid migration rate calculations: (a) case of a circular or square defect; (b) case of an infinitely long defect (from Giroud et al. 1992).

Note: The dashed lines represent the upper and lower limit of the range of values for i_{avgo} and $i_{avg\infty}$, since for a given value of h/t_s there is not a unique value of i_{avgo} and $i_{avg\infty}$ (Giroud et al. 1992). The solid lines represent the curves given by Equation 17 (Figure 4a) and Equation 18 (Figure 4b).

tion is not entirely analytical since graphs must be used. This is not convenient, especially when calculations for a large number of cases have to be performed.

3 NEW EQUATIONS TO CALCULATE THE RATE OF LIQUID MIGRATION THROUGH COMPOSITE LINERS

3.1 Analytical Expression of the Average Hydraulic Gradient

After numerous attempts, it was found that a good approximation of the values of i_{avgo} and $i_{avg\infty}$ presented in Figure 4 is given by the following equations:

$$i_{avgo} = 1 + 0.1\,(h / t_s)^{0.95} \tag{17}$$

$$i_{avg\,\infty} = 1 + 0.2\,(h / t_s)^{0.95} \tag{18}$$

3.2 New Equations for Liquid Migration Rate

Combining Equations 13 to 16 with Equations 17 and 18 gives the following equations that can be used to calculate the rate of liquid migration through composite liners:

- Circular defect:

$$Q = C_{qo}\ [1 + 0.1\,(h / t_s)^{0.95}]\ a^{0.1}\ h^{0.9}\ k_s^{0.74} \tag{19}$$

hence:

$$Q = 0.976\ C_{qo}\left[1 + 0.1\left(h / t_s\right)^{0.95}\right] d^{0.2}\ h^{0.9}\ k_s^{0.74} \tag{20}$$

- Square defect:

$$Q = C_{qo}\ [1 + 0.1\,(h / t_s)^{0.95}]\ b^{0.2}\ h^{0.9}\ k_s^{0.74} \tag{21}$$

- Infinitely long defect:

$$Q^* = C_{q\infty}\ [1 + 0.2\,(h / t_s)^{0.95}]\ b^{0.1}\ h^{0.45}\ k_s^{0.87} \tag{22}$$

- Rectangular defect:

$$Q = C_{qo}\ [1 + 0.1\,(h / t_s)^{0.95}]\ b^{0.2}\ h^{0.9}\ k_s^{0.74} + C_{q\infty}[1 + 0.2\,(h / t_s)^{0.95}]\,(B - b)\ b^{0.1}\ h^{0.45}\ k_s^{0.87} \tag{23}$$

Values of C_{qo} are given by Equations 4, 5 and 6. Values of $C_{q\infty}$ are given by Equations 9, 10 and 11. The other parameters are defined in Section 1.5. Equations 19 to 23 are semi-empirical and they must be used with the units defined in Section 1.5.

It should be noted that, when the head of liquid on top of the liner is smaller than the thickness of the low-permeability soil component of the composite liner, the value of i_{avgo} and $i_{avg\infty}$ given by Equations 17 and 18, respectively, is approximately equal to 1, and Equations 19, 20, 21, 22 and 23 become identical to Equations 2, 3, 7, 8 and 12, respectively.

3.3 Limitations

The limits of validity of the above equations are discussed in detail by Giroud et al. (1997). These limits can be summarized as follows:

- If the defect is circular, the defect diameter should be no less than 0.5 mm and not greater than 25 mm. In the case of defects that are not circular, it is proposed to use these limitations for the defect width.
- The liquid head on top of the geomembrane should be equal to or less than 3 m.
- The hydraulic conductivity of the low-permeability soil underlying the geomembrane should be equal to or less than a certain value k_G , which is less than the value k_{GB} for which the relevant equation for the considered defect type (i.e. an equation selected from Equations 19 to 23) and Bernoulli's equation for free flow through an orifice give the same value of the rate of liquid migration through the geomembrane defect.

To ensure a smooth transition between liquid migration rates calculated using Equations 19 to 23 and those calculated using Bernoulli's equation, Giroud et al. (1997) propose the following value for k_G :

$$k_G = k_{GB}/10 \tag{24}$$

In the case where the geomembrane defect is circular, k_G is given by the following equation (Giroud et al. 1997):

$$k_G = \left\{ \frac{0.3891\ d^{1.8}}{C_{qo}\left[1 + 0.1\left(\frac{h}{t_s}\right)^{0.95}\right] h^{0.4}} \right\}^{1/0.74} \tag{25}$$

Equation 25 must be used with the units defined in Section 1.5. Values of k_G calculated using Equation 25 with C_{qo} = 0.21 (i.e. good contact conditions, as indicated by Equation 5) and t_s = 0.6 m are given in Table 1.

Table 1. Hydraulic conductivity, k_G , of the low-permeability soil underlying the geomembrane that gives the upper limit of validity of the equation for liquid migration through a circular defect in a geomembrane underlain by a low-permeability soil (Equation 20).

Head of liquid on top of the geomembrane, h (m)	Geomembrane defect diameter, d (mm)						
	0.5	1	2	3	5	10	11.284
0.01	2.6×10^{-7}	1.4×10^{-6}	7.5×10^{-6}	2.0×10^{-5}	7.0×10^{-5}	3.8×10^{-4}	5.1×10^{-4}
0.03	1.4×10^{-7}	7.7×10^{-7}	4.1×10^{-6}	1.1×10^{-5}	3.8×10^{-5}	2.1×10^{-4}	2.8×10^{-4}
0.1	7.3×10^{-8}	3.9×10^{-7}	2.1×10^{-6}	5.7×10^{-6}	2.0×10^{-5}	1.1×10^{-4}	1.4×10^{-4}
0.3	3.8×10^{-8}	2.1×10^{-7}	1.1×10^{-6}	3.0×10^{-6}	1.0×10^{-5}	5.6×10^{-5}	7.5×10^{-5}
1	1.8×10^{-8}	9.5×10^{-8}	5.1×10^{-7}	1.4×10^{-6}	4.7×10^{-6}	2.6×10^{-5}	3.4×10^{-5}
3	7.1×10^{-9}	3.8×10^{-8}	2.1×10^{-7}	5.6×10^{-7}	1.9×10^{-6}	1.0×10^{-5}	1.4×10^{-5}

Notes: The tabulated values of k_G were calculated using Equation 25 with C_{qo} = 0.21 (good contact) and t_s = 0.6 m. The defect diameter of 11.284 mm corresponds to a defect surface area of 1 cm^2.

3.4 Example

A composite liner consists of a geomembrane placed on a GCL having a thickness of 6 mm and a hydraulic conductivity of 2×10^{-11} m/s. The geomembrane has a rectangular defect with a width of 1 mm and a length of 15 mm. The head of liquid on top of the composite liner is 25 mm. Calculate the rate of liquid migration through this defect.

The rate of liquid migration through the composite liner is calculated as follows using Equation 23:

$$Q = C_{qo}[1 + 0.1(25/6)^{0.95}](1\times10^{-3})^{0.2}(25\times10^{-3})^{0.9}(2\times10^{-11})^{0.74} + C_{q\infty}[1 + 0.2(25/6)^{0.95}](15-1)\times10^{-3}(1\times10^{-3})^{0.1}(25\times10^{-3})^{0.45}(2\times10^{-11})^{0.87}$$

hence:

$$Q(\mathrm{m}^3/\mathrm{s}) = C_{qo}(1.53\times10^{-10}) + C_{q\infty}(1.17\times10^{-12})$$

Assuming good contact between the geomembrane and the GCL, Equations 5 and 10 give:

$$C_{qo} = 0.21 \qquad C_{q\infty} = 0.52$$

hence:

$$Q\,(\mathrm{m/s^3}) = 0.21 \times 1.53 \times 10^{-10} + 0.52 \times 1.17 \times 10^{-12} = 3.21 \times 10^{-11} + 6.08 \times 10^{-13}$$

hence:

$$Q = 3.27 \times 10^{-11}\ \mathrm{m/s^3} = 2.8 \times 10^{-3}\ \mathrm{liters/day} = 1.0\ \mathrm{liter/year}$$

It is interesting to note that, if the defect had been square with a side length of 1 mm, the rate of liquid migration through the defect would have been expressed by the first term of the above equation (3.21×10^{-11} m^3/s), which is much greater than the second term. In other words, the calculated rate of liquid migration is only slightly greater through the 15 mm × 1 mm defect than through the 1 mm × 1 mm defect. This is because, in this particular example, the radius of the wetted area, calculated as indicated by Giroud et al. (1992), is very large compared to the defect size and is far more dependent on defect width than on defect length. (The calculation gives a wetted area radius of approximately 0.6 m.)

4 CONCLUSIONS

The equations presented in this paper provide design engineers with an entirely analytical method to calculate the rate of liquid migration through a composite liner, due to geomembrane defects, for liquid heads on top of the liner up to 3 m. The new equations are equivalent to the existing method (Giroud et al. 1992, 1994) which requires both equations and graphs when the head of liquid on top of the liner is greater than the thickness of the low-permeability soil component of the composite liner. However, the new equations are more convenient because the values that had to be obtained from graphs are now incorporated into the equations (Equations 19 to 23).

The new equations are particularly useful in cases where the low-permeability soil component of the composite liner is a GCL because the head of liquid on top of the liner is often greater than the thickness of the GCL.

ACKNOWLEDGMENTS

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NOTATIONS

Basic SI units are given in parentheses.

a	=	defect area (m^2)
B	=	length of rectangular defect (m)
b	=	width of rectangular defect (m)
b	=	side length of square defect (m)
C_q	=	contact quality factor (dimensionless)
C_{qo}	=	contact quality factor for a circular or square defect (dimensionless)
C_{qogood}	=	value of C_{qo} in the case of good contact conditions (dimensionless)
C_{qopoor}	=	value of C_{qo} in the case of poor contact conditions (dimensionless)
$C_{q\infty}$	=	contact quality factor for a defect of infinite length (dimensionless)
$C_{q\infty\ good}$	=	value of $C_{q\infty}$ in the case of good contact conditions (dimensionless)
$C_{q\infty\ poor}$	=	value of $C_{q\infty}$ in the case of poor contact conditions (dimensionless)
D		depth of liquid on top of the geomembrane (m)
d	=	diameter of circular defect (m)
h	=	head of liquid on top of the geomembrane (m)
i_{avgo}	=	average hydraulic gradient in the low-permeability soil in the case of a circular or square defect (dimensionless)
$i_{avg\infty}$	=	average hydraulic gradient in the low-permeability soil in the case of an infinitely long defect (dimensionless)
k_G	=	value of k_s above which Equations 19 to 23 are not valid (m/s)
k_{GB}	=	value of k_s for which Equation 19 to 23 and Bernoulli's equation for free flow through an orifice give the same value of the rate of liquid migration through a geomembrane defect (m/s)

k_s = hydraulic conductivity of the low-permeability soil component of the composite liner (m/s)

Q = liquid migration rate through the considered geomembrane defect (m^3/s)

Q^* = liquid migration rate per unit length of geomembrane defect in the case of an infinitely long defect (m^2/s)

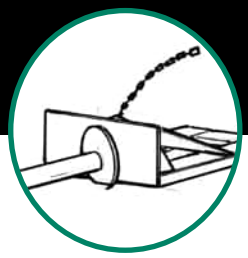
R = radius of wetted area (m)

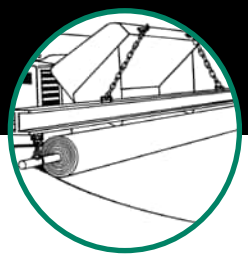
t = thickness of liquid on top of the geomembrane (m)

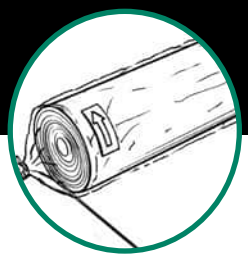
t_s = thickness of the low-permeability soil component of the composite liner (m)

β = slope angle (°)

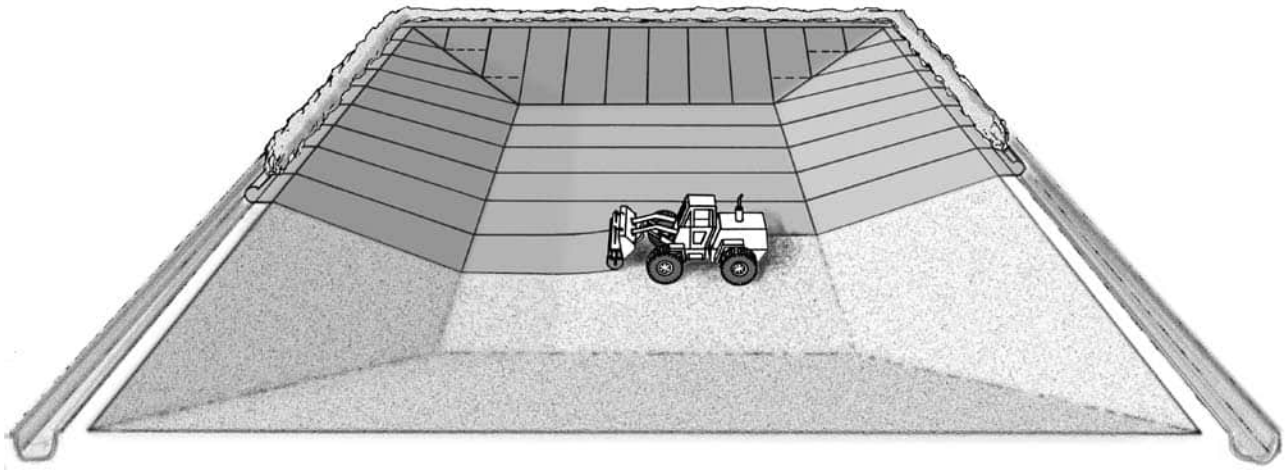








Installation Guidelines



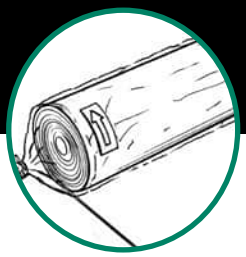
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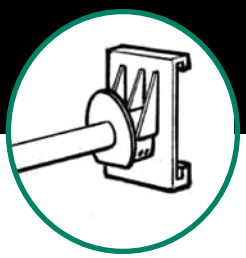
Geosynthetic Clay Liners

CETCO®

NOTICE: This document is intended for use as a GENERAL GUIDELINE for the installation of CETCO's GCLs. The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information. Installation guidelines are subject to periodic changes. Please consult our CETCO Engineering Website @ www.cetco.com/LTE for the most recent version.

TABLE OF CONTENTS





1. Introduction 3

2. Equipment Requirements 3

3. Shipping, Unloading, and Storage 5

4. Subgrade Preparation 6

5. Installation 7

6. Anchorage 9

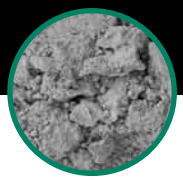
7. Seaming 10

8. Sealing Around Penetrations and Structures 11

9. Damage Repair 14

10. Cover Placement 14

11. Hydration 15



1 INTRODUCTION

1.1 This document provides procedures for the installation of CETCO's GCLs in a manner that maximizes safety, efficiency, and the physical integrity of the GCL.

1.2 These guidelines are based upon many years of experience at a variety of sites and should be generally applicable to any type of lining project using CETCO's GCLs. Variance from these guidelines is at the engineer's discretion.

1.3 The performance of the GCL is wholly dependent on the quality of its installation. It is the installer's responsibility to adhere to these guidelines, and to the project specifications and drawings, as closely as possible. It is the engineer's and owner's responsibility to provide construction quality assurance (CQA) for the installation, to ensure that the installation has been executed properly. This document covers only installation procedures.

1.4 For additional guidance, refer to ASTM D5888 (Standard Guide For Storage and Handling of Geosynthetic Clay Liners) and ASTM D 6102 (Standard Guide For Installation of Geosynthetic Clay Liners).

2 EQUIPMENT REQUIREMENTS

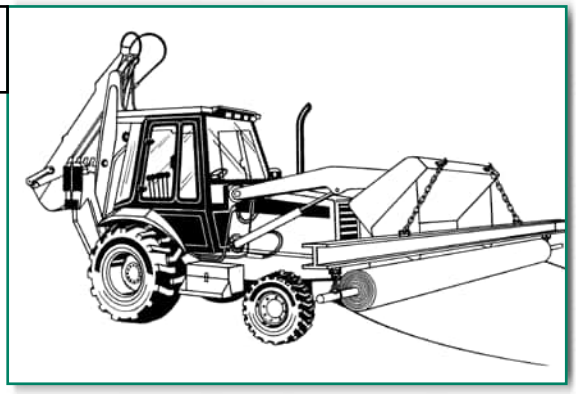
2.1 CETCO GCLs are delivered in rolls typically 2,600-2,950 lbs (1180-1340 kg). Roll dimensions and weights will vary with the dimensions of the product ordered. It is necessary to support this weight using an appropriate core pipe as indicated in Table 1. For any installation, the core pipe must not deflect more than 3 inches (75 mm) as measured from end to midpoint when a full GCL roll is lifted.

TABLE 1 CORE REQUIREMENTS

Product(s)	Nominal GCL Roll Size W x Dia. Ft. (m) x in. (mm)	Typical GCL Roll Wt., lbs. (kg)	Interior Core Size, in. (mm)	Core Pipe Length x Diameter, ft. x in. (m x mm)	Minimum Core Pipe Strength
Bentomat DN, SDN	16' x 24" (4.9 x 610)	2,650 (1200)	3 3/4 (100)	20 x 3.5"O.D.(6.1 m x 89 mm)	XXH
Bentomat ST	16' x 24" (4.9 x 610)	2,600 (1180)	3 3/4 (100)	20 x 3.5"O.D.(6.1 m x 89 mm)	XXH
Bentomat CLT	16' x 26" (4.9 x 660)	2,950 (1340)	3 3/4 (100)	20 x 3.5"O.D.(6.1 m x 89 mm)	XXH
Claymax 200R	16' x 20" (4.9 x 510)	2,750 (1250)	3 3/4 (100)	20 x 3.5"O.D.(6.1 m x 89 mm)	XXH
Bentomat CL	16' x 25" (4.9 x 635)	2,675 (1213)	3 3/4 (100)	20 x 3.5"O.D.(6.1 m x 89 mm)	XXH

2.2 Lifting chains or straps appropriately rated should be used in combination with a spreader bar made from an I-beam as shown in Figure 1.

FIGURE 1 **SPREADER BAR LIFTING ASSEMBLY**



2.3 The spreader bar ensures that lifting chains or straps do not chafe against the ends of the GCL roll, allowing it to rotate freely during installation. Spreader bar and core pipe kits are available through CETCO.

2.4 A front end loader, backhoe, dozer, or other equipment can be utilized with the spreader bar and core pipe or slings. Alternatively, a forklift with a "stinger" attachment may be used for on-site handling. A forklift without a stinger attachment should not be used to lift or handle the GCL rolls. Stinger attachments (Figure 2-4) are specially fabricated to fit various forklift makes and models.

FIGURE 2 **HOOK MOUNT**

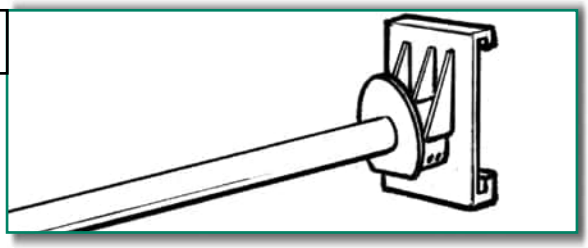


FIGURE 3 **FORK MOUNT** (with fork pockets)

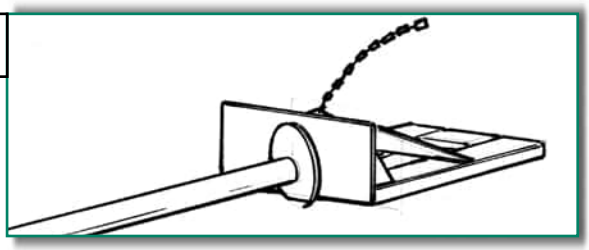
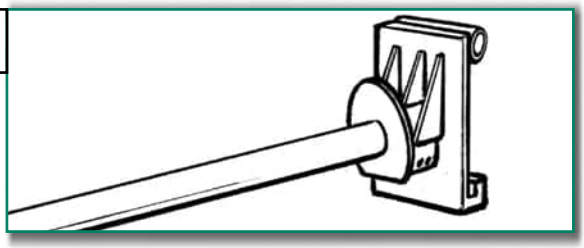


FIGURE 4 **PIN MOUNT**



2.5 When installing over certain geosynthetic materials, a 4-wheel, all-terrain vehicle (ATV) can be used to deploy the GCL. An ATV can be driven directly on the GCL provided that no sudden stops, starts, or turns are made.

2.6 Additional equipment needed for installation of CETCO's GCLs includes:

- Utility knife and spare blades (for cutting the GCL).
- Granular bentonite for end-of-roll GCL seams and for sealing around structures and details. Granular bentonite is available from CETCO.
- Waterproof tarpaulins (for temporary cover on installed material as well as for stockpiled rolls).
- Optional flat-bladed vise grips (for positioning the GCL panel by hand).

2.7 The CETCO Easy Roller™ GCL Deployment System is a preferred method of installing geosynthetic clay liners. Use of the Easy Roller system eliminates the need for spreader bars and heavy core pipes. Installation speed and worker safety are significantly increased. For further details, contact CETCO.

3 SHIPPING, UNLOADING & STORAGE

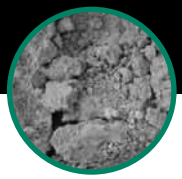
3.1 All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and the affected rolls marked.

3.2 Major damage suspected to have occurred during transit should be reported immediately to the carrier and to CETCO. The nature of the damage should also be indicated on the bill of lading with the specific lot and roll numbers. Accumulation of some moisture within roll packaging is normal and does not damage the product.

3.3 The party directly responsible for unloading the GCL should refer to this manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised.

3.4 In most cases, CETCO GCLs are delivered on flatbed trucks. There are three methods of unloading: core pipe and spreader bar; slings; or stinger bar. To unload the rolls from the flatbed using a core pipe and spreader bar, first insert the core pipe through the core tube. Secure the lifting chains or straps to each end of the core pipe and to the spreader bar mounted on the lifting equipment. Hoist the roll straight up and make sure its weight is evenly distributed so that it does not tilt or sway when lifted.

3.5 At the customer's request, CETCO GCLs may be delivered with two 2" x 12' (50 mm x 3.65 m) Type V polyester endless slings on each roll. Before lifting, check the position of the slings. Each sling should be tied off in the choke position approximately one third (1/3) from the end of the roll. Hoist the roll straight up so that it does not tilt or sway when lifted.



3.6 In some cases, GCL rolls will be stacked in three pyramids on flatbed trucks. If slings are not used, rolls will require unloading with a stinger bar and extendible boom fork lift. Spreader bars will not work in this situation because of the limited access between the stacks of GCL. Three types of stingers are available from CETCO (Figures 2-4). To unload, guide the stinger through the core tube before lifting the GCL roll and removing from the truck.

3.7 An extendible boom fork lift with a stinger bar is required for unloading vans. Rolls in the nose and center of van should first be carefully pulled toward the door using the slings provided on the rolls.

3.8 Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry and stable. Moisture protection of the GCL is provided by its packaging; however, an additional tarpaulin or plastic sheet is recommended.

3.9 Rolls should be stacked in a manner that prevents them from sliding or rolling. This can be accomplished by chocking the bottom layer of rolls. Rolls should be stacked no higher than the height at which they can be safely handled by laborers (typically no higher than four layers of rolls). Rolls should never be stacked on end.

4 SUBGRADE PREPARATION

4.1 Subgrade surfaces consisting of granular soils or gravels are not acceptable due to their large void fraction and puncture potential. In applications where the GCL is the only barrier, subgrade soils should have a particle-size distribution at least 80 percent finer than the #60 sieve (0.25 mm). In other applications, subgrade soils should range between fines and 1 inch (25 mm). In high-head applications (greater than 1 foot or 30.48 cm), CETCO recommends a membrane-laminated GCL (Bentomat CL or Bentomat CLT).

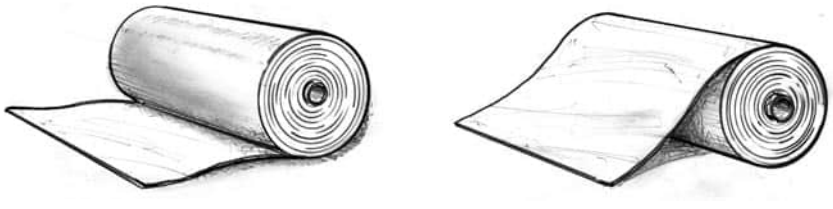
4.2 When the GCL is placed over an earthen subgrade, the subgrade surface must be prepared in accordance with the project specifications. The engineer's approval of the subgrade must be obtained prior to installation. The finished surface should be firm and unyielding, without abrupt elevation changes, voids, cracks, ice, or standing water.

4.3 The subgrade surface must be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade should be rolled with a smooth-drum compactor to remove any wheel ruts greater than 1 inch in depth, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall be removed, crushed, or pushed into the surface with a smooth-drum compactor. The GCL may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the above requirements.

5 INSTALLATION

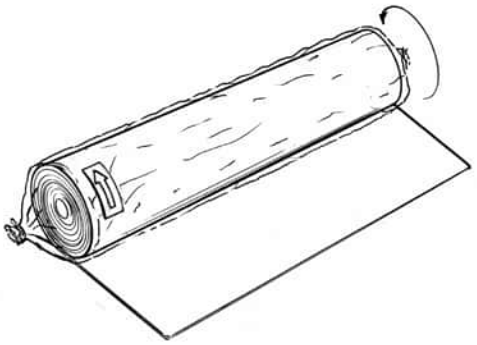
5.1 GCL rolls should be taken to the work area of the site in their original packaging. The orientation of the GCL (i.e., which side faces up) may be important if the GCL has two different types of geosynthetics. Check with the project engineer in order to determine if there is a preferred installation orientation for the GCL. If no specific orientation is required, allow the roll to unwind from the bottom rather than pulling from the top (Figure 5). The arrow sticker on the plastic sleeve indicates the direction the GCL will naturally unroll when placed on the ground (Figure 6). Prior to deployment, the packaging should be carefully removed without damaging the GCL.

FIGURE 5 THE GCL CAN BE UNROLLED IN ITS "NATURAL" ORIENTATION (A) OR CAN BE PULLED FROM THE TOP OF THE ROLL (B)



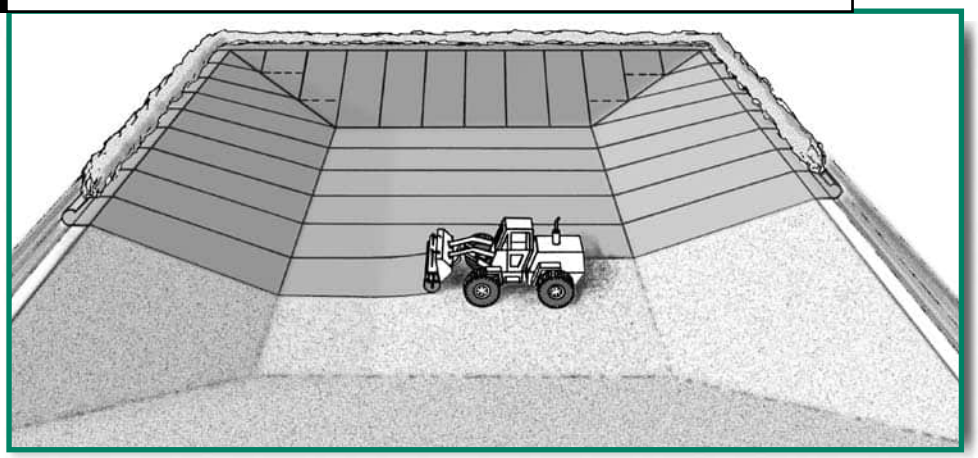
"NATURAL" ORIENTATION (A) (B)

FIGURE 6 DIRECTION TO UNROLL GCL ON GROUND PER FIGURE 5(A)



5.2 Equipment which could damage the GCL should not be allowed to travel directly on it. Acceptable installation, therefore, may be accomplished such that the GCL is unrolled in front of backwards-moving equipment (Figure 7). If the installation equipment causes rutting of the sub-grade, the subgrade must be restored to its originally accepted condition before placement continues.

FIGURE 7 **TYPICAL BENTOMAT®/CLAYMAX® INSTALLATION TECHNIQUE**

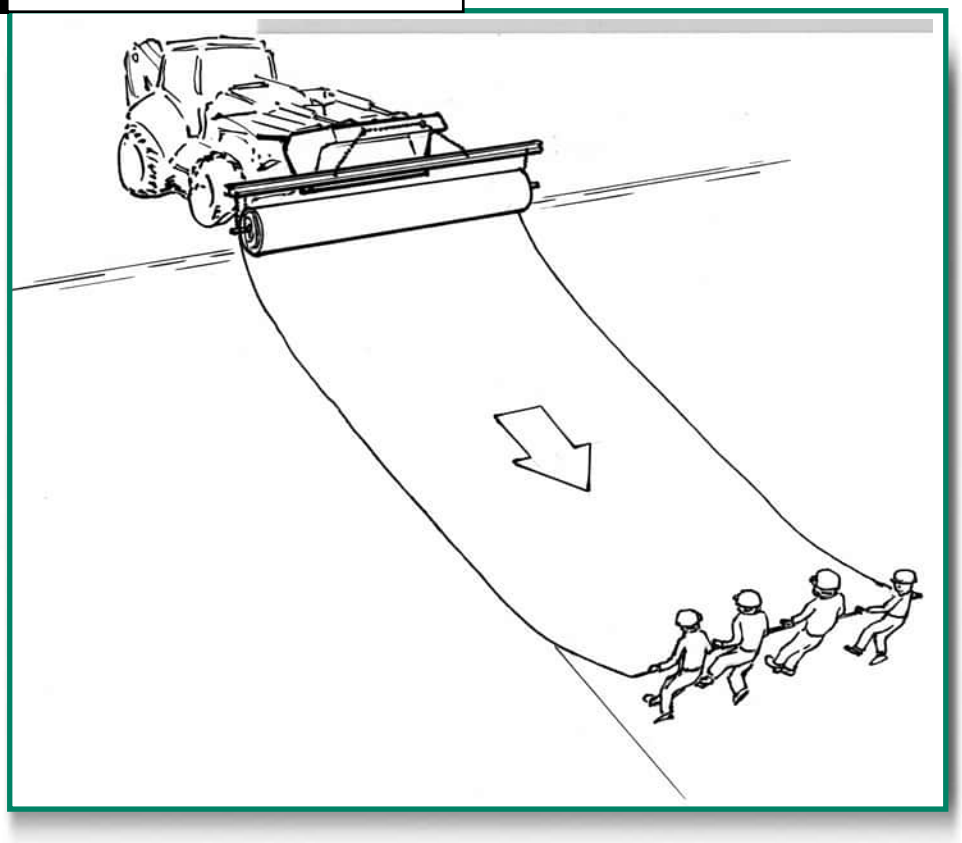


5.3 If sufficient access is available, GCL may be deployed by suspending the roll at the top of the slope with a group of laborers pulling the material off of the roll and down the slope (Figure 8).

5.4 GCL rolls should not be released on the slope and allowed to unroll freely by gravity.

5.5 Care must be taken to minimize the extent to which the GCL is dragged across the subgrade in order to avoid damage to the bottom surface of the GCL. Care must also be taken when adjusting Bentomat CLT panels to avoid damage to the geotextile surface of one panel of GCL by the textured sheet of another panel of GCL. A temporary geosynthetic subgrade covering, commonly known as a slip sheet or rub sheet, may be used to reduce friction damage during placement.

FIGURE 8 **UNROLLING BENTOMAT**



5.6 The GCL should be placed so that seams are parallel to the direction of the slope. End-of-panel seams should also be located at least 3 ft (1m) from the toe and crest of slopes steeper than 4H:1V. End-of-roll seams on slopes should be used only if the liner is not expected to be in tension.

5.7 All GCL panels should lie flat, with no wrinkles or folds, especially at the exposed edges of the panels. When Bentomat with SuperGroove® is repositioned, it should be gripped inside the SuperGroove by folding the edge.

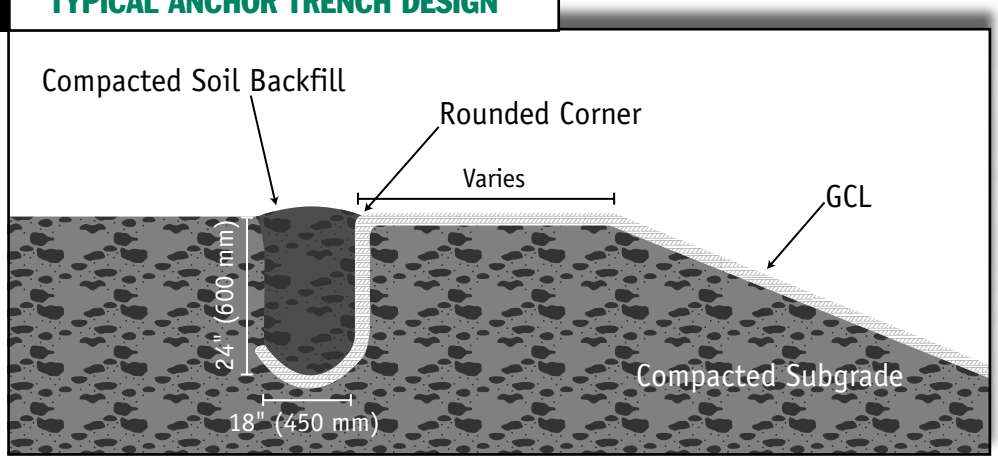
5.8 The GCL should not be installed in standing water or during rainy weather. Only as much GCL shall be deployed as can be covered at the end of the working day with soil, geomembrane, or a temporary waterproof tarpaulin. The GCL shall not be left uncovered overnight. If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. CETCO recommends that premature hydration be evaluated on a case-by-case basis. The project engineer, CQA inspector, and CETCO's TR-312 should be consulted for specific guidance if premature hydration occurs. The type of GCL, duration of exposure, degree of hydration, location in the liner system, and expected bearing loads should be considered. In many instances, a needlepunch reinforced GCL may not require removal/replacement if the following are true: (1) the geotextiles have not been separated, torn or otherwise damaged; (2) there is no evidence that the needlepunching between the two geotextiles has been compromised; (3) the Bentomat does not leave deep indentations when stepped upon; and (4) any overlapped seams with bentonite enhancement (see Section 7) are intact.

5.9 For the convenience of the installer, hash marks are placed on Bentomat every 5' (1.5 m) of length.

6 ANCHORAGE

6.1 If required by the project drawings, the end of the GCL roll should be placed in an anchor trench at the top of a slope. The front edge of the trench should be rounded to eliminate any sharp corners that could cause excessive stress on the GCL. Loose soil should be removed or compacted into the floor of the trench.

FIGURE 9 **TYPICAL ANCHOR TRENCH DESIGN**



6.2 If a trench is used for anchoring the end of the GCL, soil backfill should be placed in the trench to provide resistance against pullout. The size and shape of the trench, as well as the appropriate backfill procedures, should be in accordance with the project drawings and specifications. Typical dimensions are shown in Figure 9.

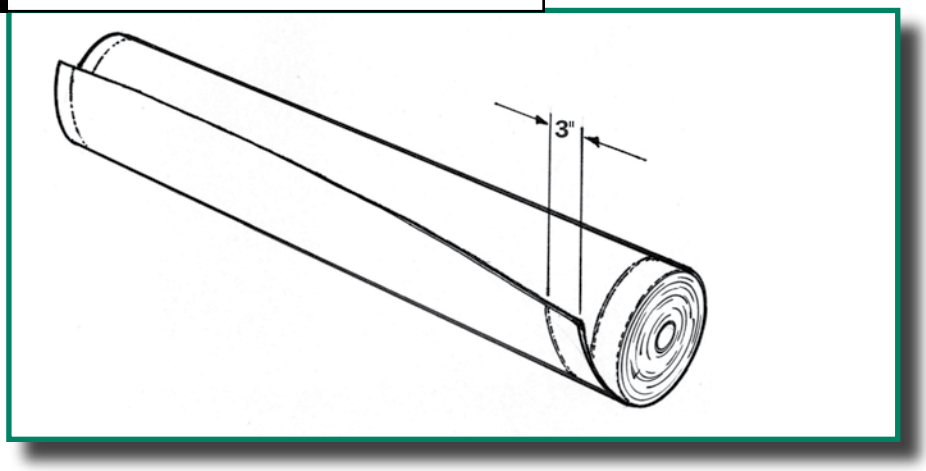
6.3 The GCL should be placed in the anchor trench such that it covers the entire trench floor but does not extend up the rear trench wall.

6.4 Sufficient anchorage may alternately be obtained by extending the end of the GCL roll back from the crest of the slope, and placing cover soil. The length of this "runout" anchor should be prepared in accordance with project drawings and specifications.

7 SEAMING

7.1 GCL seams are constructed by overlapping adjacent panel edges and ends. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. Supplemental bentonite is not required for Claymax 200R. Bentomat ST, DN, and SDN with Supergroove® have self-seaming capabilities in their longitudinal overlaps (Figure 10) and do not require supplemental bentonite. For pond applications, supplemental bentonite must be used in longitudinal seams regardless of the CETCO GCL used.

FIGURE 10 SUPERGROOVE



7.2 Longitudinal seams should be overlapped a minimum of 6 inches (150mm) for Bentomat and 12 inches (300mm) for Claymax. For high-head applications (greater than 1 foot or 30.48 cm) involving Bentomat CL or Bentomat CLT, a minimum longitudinal seam overlap of 12 inches (300 mm) and supplemental bentonite per Section 7.6 is recommended.

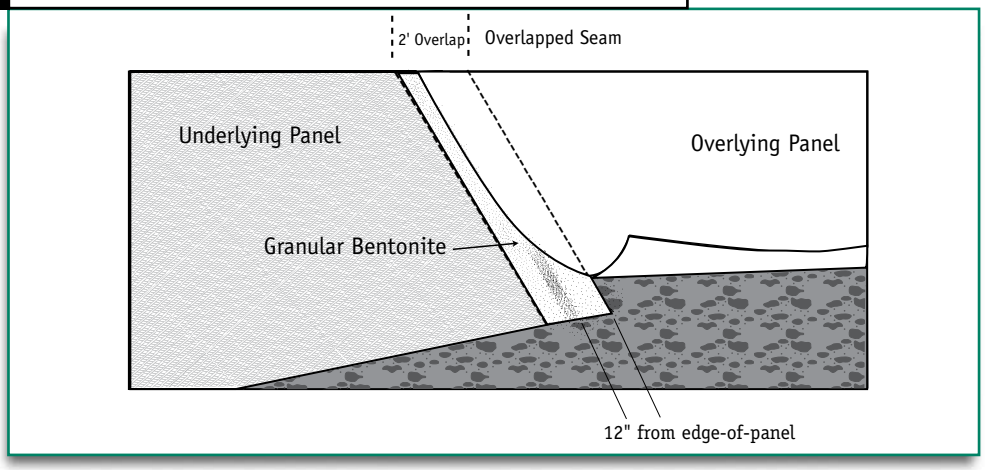
7.3 End-of-panel overlapped seams should be overlapped 24 inches (600mm) for Bentomat and 48 inches (1,200mm) for Claymax.

7.4 End-of-panel overlapped seams are constructed such that they are shingled in the direction of the grade to prevent runoff from entering the overlap zone. End-of-panel seams on slopes are permissible, provided adequate slope stability analysis has been conducted (i.e., the GCL is not expected to be in tension). Bentonite-enhanced seams are required for all Bentomat end-of-panel overlapped seams.

7.5 Bentomat end-of-panel, bentonite-enhanced, overlapped seams are constructed first by overlapping the adjacent panels, exposing the underlying panel, and then applying a continuous bead or fillet of granular sodium bentonite 12" from the edge of the underlying panel (Figure 11). The minimum application rate at which the bentonite is applied is one-quarter pound per linear foot (0.4 kg/m).

7.6 If longitudinal bentonite enhanced seams are required for Bentomat ST, DN, or SDN, they are constructed first by overlapping the adjacent panels by a minimum 6-inches (150 mm), exposing the underlying edge, and applying a continuous bead of granular bentonite approximately 3-inches (75 mm) from the edge. For pond applications involving Bentomat CL or CLT, longitudinal seams are constructed by overlapping adjacent panels by 12-inches (300 mm), exposing the underlying edge and applying a continuous bead of bentonite approximately 6-inches (150 mm) from the edge. The minimum application rate for the granular bentonite is one quarter pound per linear foot (0.4 kg/m).

FIGURE 11 **BENTOMAT END-OF-PANEL OVERLAPPED SEAM**



8 SEALING AROUND PENETRATIONS AND STRUCTURES

8.1 Cutting the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid irregular tearing of the geotextile components of the GCL during the cutting process.

8.2 The GCL should be sealed around penetrations and structures embedded in the subgrade in accordance with Figures 12 through 14. Granular bentonite shall be used liberally (approx. 2 lbs. /ln ft. or 3 kg/m) to seal the GCL to these structures.

FIGURE 12A CROSS-SECTION OF A HORIZONTAL PIPE PENETRATION

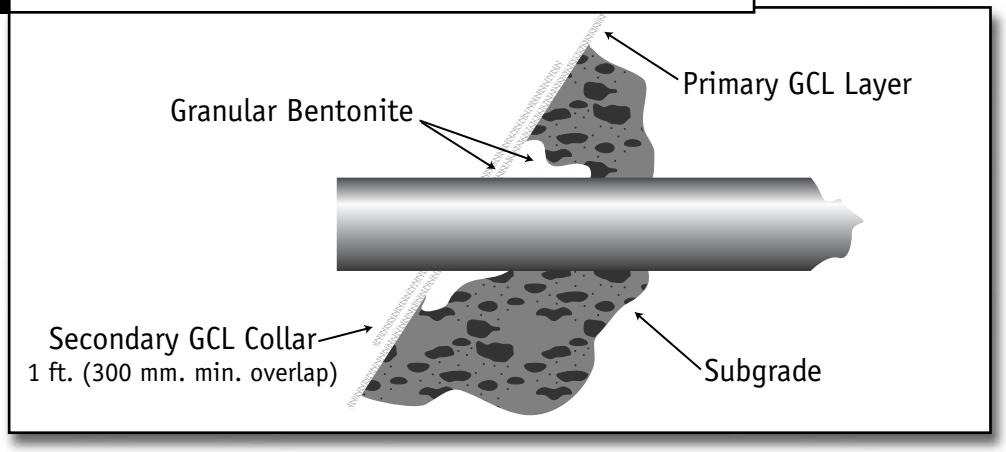
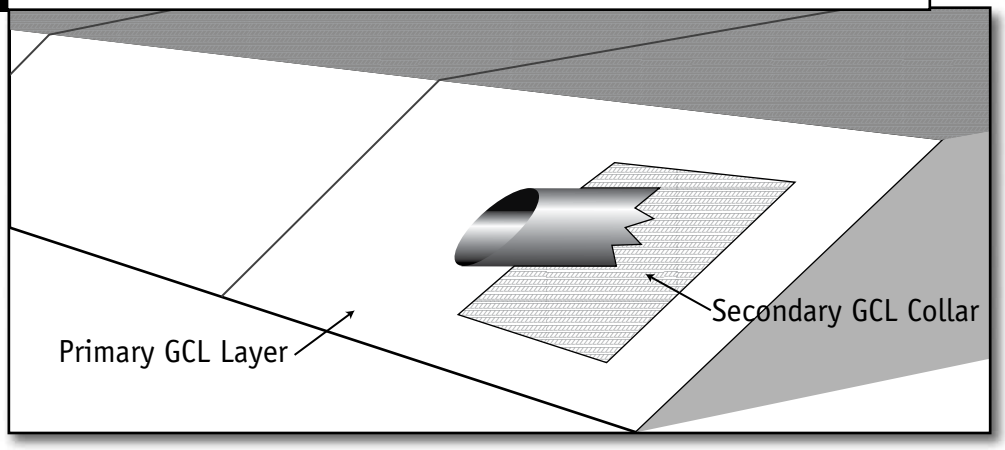
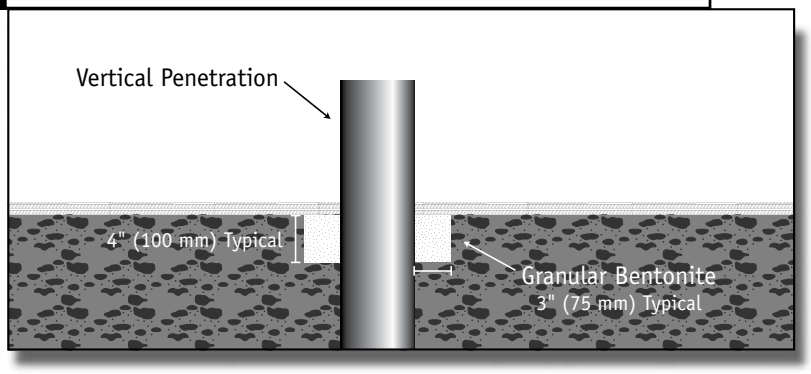


FIGURE 12B ISOMETRIC VIEW OF A COMPLETED HORIZONTAL PIPE PENETRATION



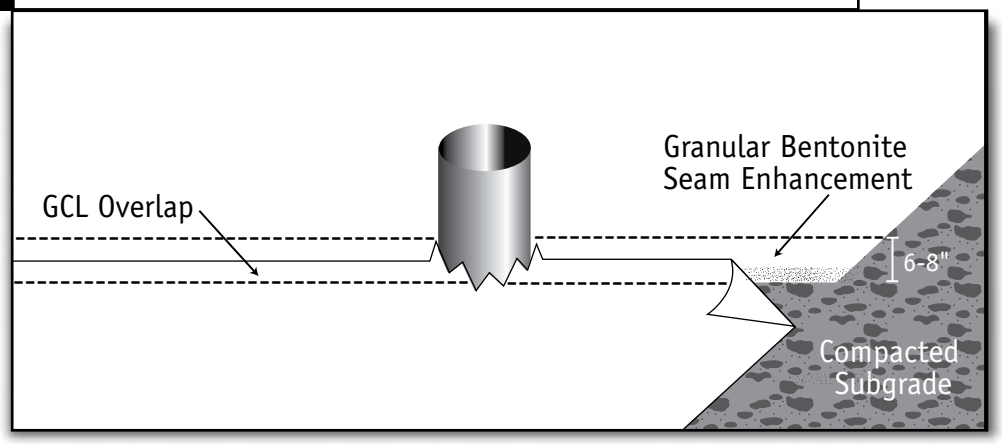
8.3 When the GCL is placed over a horizontal pipe penetration, a "notch" should be excavated into the subgrade around the penetration (Figure 12a). The notch should then be backfilled with granular bentonite. A secondary collar of GCL should be placed around the penetration as shown in Figure 12b. It is helpful to first trace an outline of the penetration on the GCL and then cut a "star" pattern in the collar to enhance the collar's fit to the penetration. Granular bentonite should be applied between the primary GCL layer and the secondary GCL collar.

FIGURE 13A CROSS-SECTION OF A VERTICAL PENETRATION



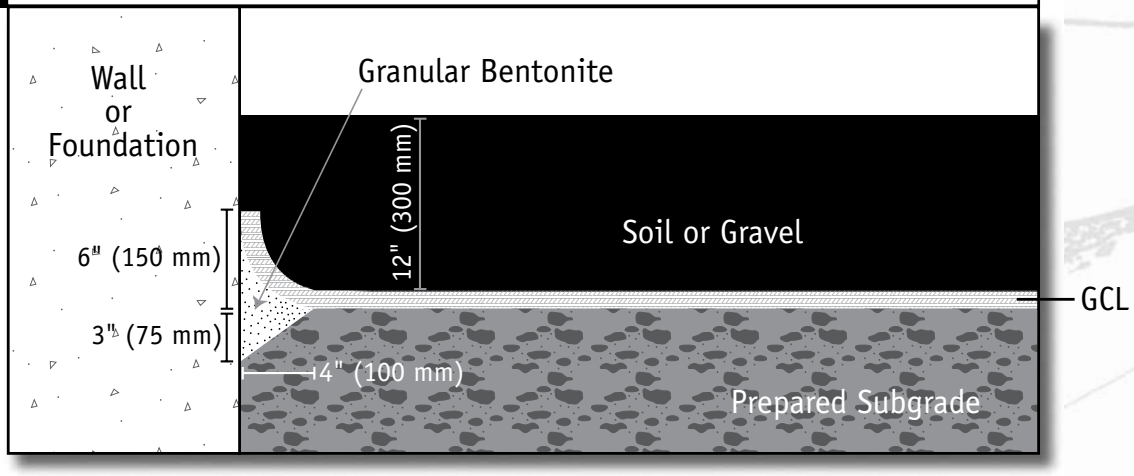
8.4 Vertical penetrations are prepared by notching into the subgrade as shown in Figure 13a. The penetration can be completed with two separate pieces of GCL as shown in Figure 13b. Alternatively, a secondary collar can be placed as in Figure 12a or 12b.

FIGURE 13B **ISOMETRIC VIEW OF THE COMPLETED VERTICAL PENETRATION**



8.5 When the GCL is terminated at a structure or wall that is embedded into the subgrade on the floor of the containment area, the subgrade should be notched as described in Sections 8.3 and 8.4. The notch is filled with granular bentonite, and the GCL should be placed over the notch and up against the structure (Figure 14). Connection to the structure can be accomplished by placement of soil or stone backfill in this area. When structures or walls are at the top of a slope, additional detailing may be required. Contact CETCO for specific guidance.

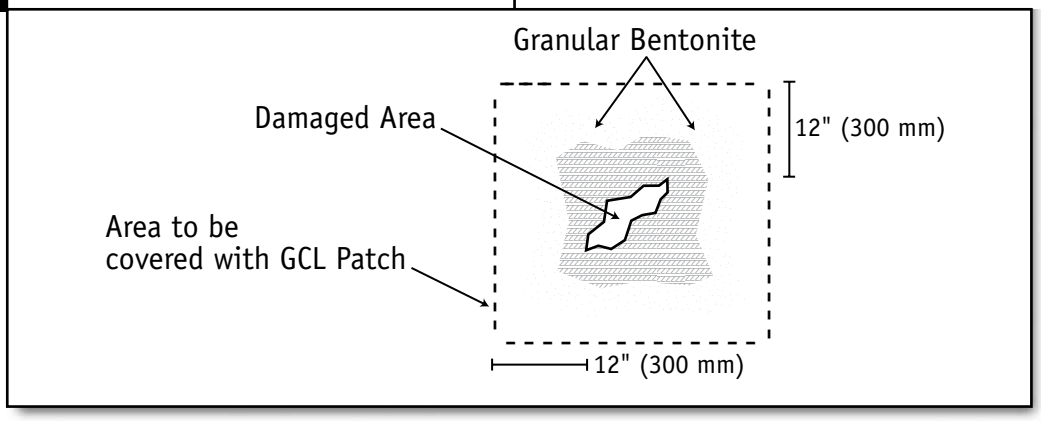
FIGURE 14 **CROSS-SECTION OF GCL SEAL AGAINST AN EMBEDDED STRUCTURE OR WALL**



9 DAMAGE REPAIR

9.1 If the GCL is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area (Figure 15). The patch should be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all parts of the damaged area. Granular bentonite should be applied around the damaged area prior to placement of the patch. It may be necessary to use an adhesive such as wood glue to affix the patch in place so that it is not displaced during cover placement. Smaller patches may be tucked under the damaged area to prevent patch movement.

FIGURE 15 **DAMAGE REPAIR BY PATCHING**



10 COVER PLACEMENT

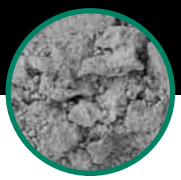
10.1 The final thickness of soil cover on the GCL varies with the application. A minimum cover layer must be at least 1 foot (300 mm) thick to provide confining stress to the GCL, eliminate the potential for seam separation and prevent damage by equipment, erosion, etc.

10.2 Cover soils should be free of angular stones or other foreign matter that could damage the GCL. Cover soils should be approved by the Engineer with respect to particle size, uniformity, and chemical compatibility. Consult CETCO if cover soils with high concentrations of calcium (e.g., limestone, dolomite, gypsum, seashell fragments) are present.

10.3 Recommended cover soils should have a particle size distribution ranging between fines and 1 inch (25 mm), unless a cushioning geotextile is specified.

10.4 Soil cover shall be placed over the GCL using construction equipment that minimizes stresses on the GCL. A minimum thickness of 1 foot (300 mm) of cover soil should be maintained between the equipment tires/tracks and the GCL at all times during the covering process. In frequently high-traffic areas or roadways, a minimum thickness of 2 feet (600 mm) is required.

10.5 Soil cover should be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover should be pushed up slopes, not down slopes, to minimize tensile forces on the GCL.



10.6 When a textured geomembrane is installed over the GCL, a temporary geosynthetic covering known as a slip sheet or rub sheet should be used to minimize friction during placement and to allow the textured geomembrane to be more easily moved into its final position.

10.7 Claymax must be covered with a geomembrane and/or 12" (300 mm) of cover material within 8 hours of deployment to prevent the potential for shrinkage by desiccation.

10.8 Cyclical wetting and drying of GCL covered only with geomembrane can cause overlap separation. Soil cover should be placed promptly whenever possible. Geomembranes should be covered with a white geotextile and/or operations layer without delay to minimize the intensity of wet-dry cycling. If there is the potential for unconfined cyclic wetting and drying over an extended period of time, the longitudinal seam overlaps should be increased based on the project engineer's recommendations.

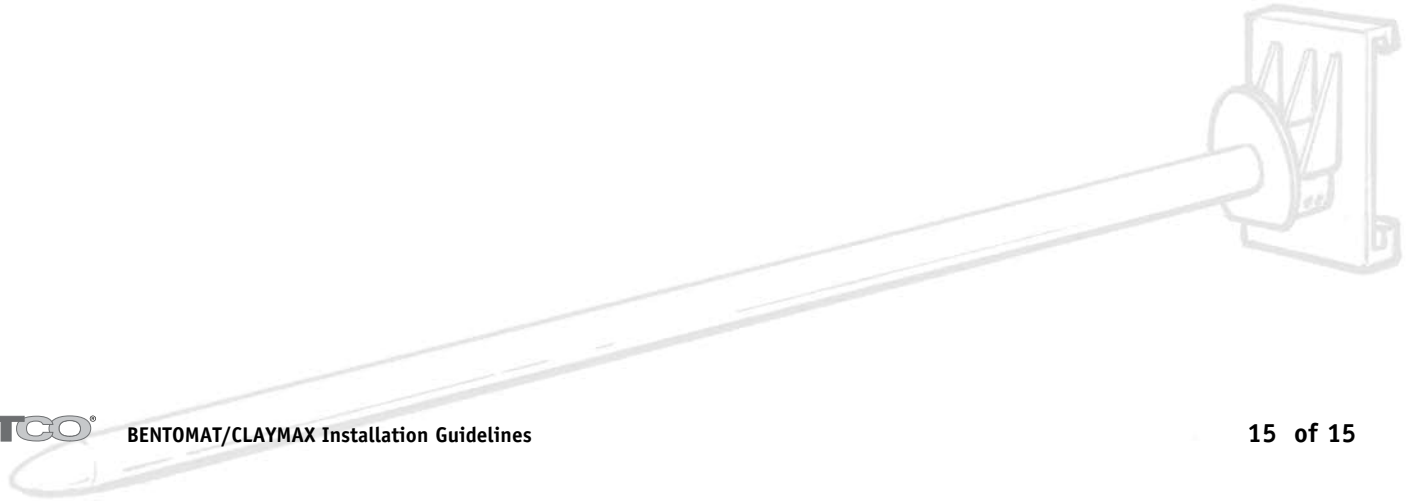
10.9 To avoid seam separation, the GCL should not be put in excessive tension by the weight or movement of textured geomembrane on steep slopes. If there is the potential for unconfined geomembrane expansion and contraction over an extended period of time, the longitudinal seam overlaps should be increased based upon the project engineer's recommendations.

11 HYDRATION

11.1 Hydration is usually accomplished by natural rainfall and/or absorption of moisture from soil. However, in cases where the containment of non-aqueous liquid is required, it may be necessary to hydrate the covered GCL with water prior to use.

11.2 If manual hydration is necessary, water can be introduced by flooding the covered lined area or using a sprinkler system.

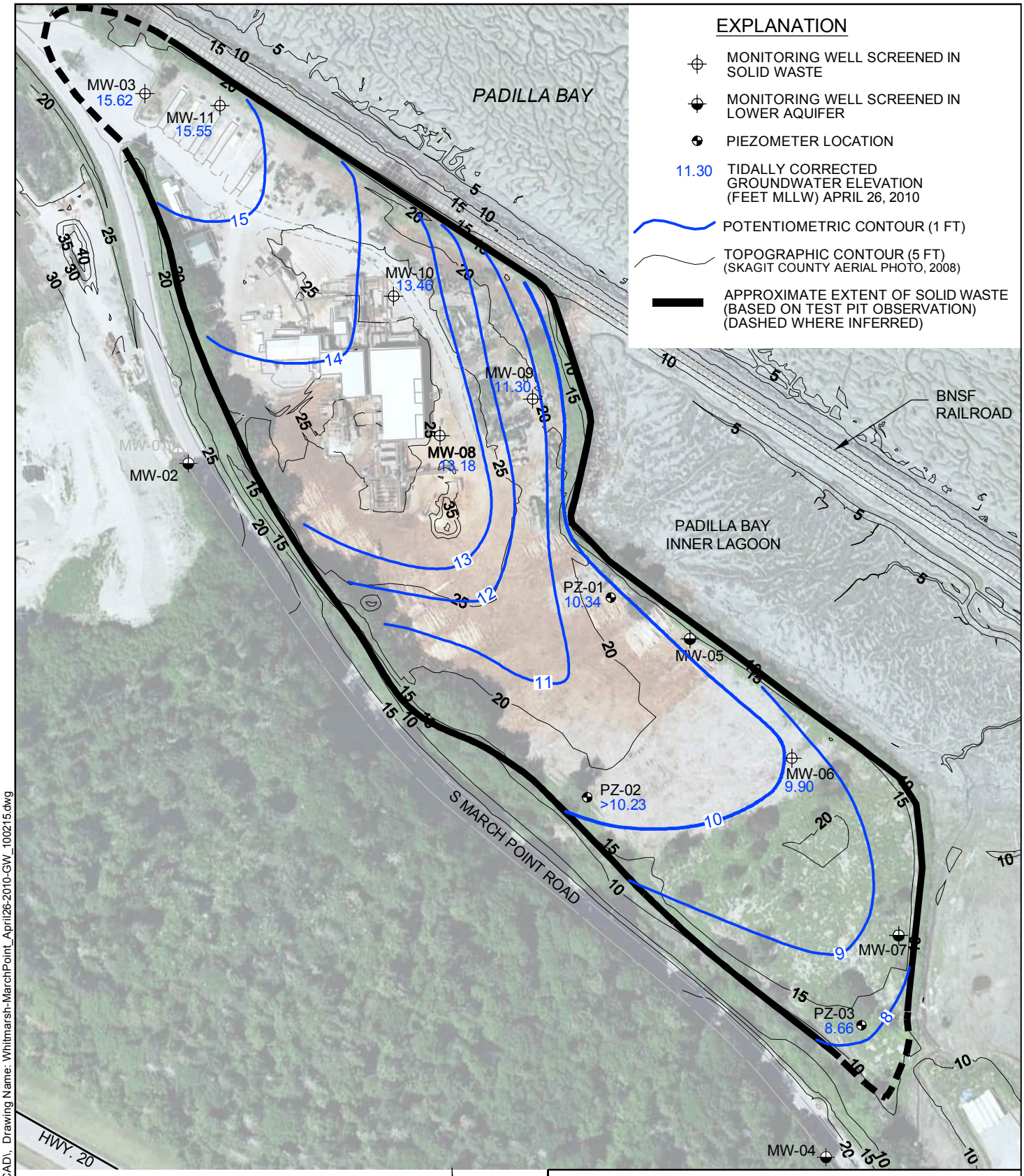
11.3 If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. As discussed in Section 5.8, in many instances, a needlepunch reinforced GCL may not require removal/replacement if the following are true: (1) the geotextiles have not been separated, torn, or otherwise damaged; (2) there is not evidence that the needlepunching between the two geotextiles has been compromised; (3) the Bentomat does not leave deep indentations when stepped upon, and (4) any overlapped seams with bentonite enhancement (see Section 7) are intact.





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Aerial Photo Courtesy of Google Earth (USGS, May 30, 2009)

NOTE:
Tidally corrected groundwater elevation on April 26, 2010, calculated based on 71 consecutive one-hour groundwater level measurements using method developed by Serfes (1991).

POTENTIOMETRIC SURFACE MAP
APRIL 26, 2010
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 03/03/16	Project No. 14159
amec		Figure 16

Plot Date: 03/03/16 - 4:39pm, Plotted by: adam.stenberg
Drawing Path: S:\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_April26-2010-GW_100215.dwg

MEMORANDUM

DATE April 8, 2025

Project No. US0041081.0037

TO Koorus Tahghighi

FROM James Roman and Kate Richards

EMAIL James.Roman@wsp,com and Kate.Richards2 @wsp.com

SUBJECT: WHITMARSH LANDFILL GROUNDWATER FLOW MODEL

1 INTRODUCTION

The former March Point (Whitmarsh) Landfill is located in Anacortes, Washington (the Landfill), Washington State Department of Ecology (Ecology) Facility Site ID 2662. The Landfill is located north of South March Point Road at the base of a bluff in the tidelands area of Padilla Bay and is approximately 14 acres.

WSP USA, Inc. (WSP) built a groundwater flow model (the model) using MODFLOW-USG-Transport version 2.02.1 (Panday et al. 2013 and Panday 2024) to evaluate groundwater discharge to a proposed dewatering trench to support the Whitmarsh Landfill project (WSP, 2025). This technical memorandum provides details on the development and results of the groundwater flow model, which simulates a range of hydrogeological parameters to represent subsurface heterogeneity and provides possible ranges of groundwater discharge into the proposed dewatering trench.

2 GROUNDWATER OCCURRENCE AND FLOW

The Landfill's general lithology and understanding of the groundwater flow system is that the water-bearing zone is under unconfined conditions. Groundwater flow is dependent on recharge from precipitation and local topography, which ranges from 10 to 30 feet above mean lower low water (MLLW) (AMEC 2017) across the site. Groundwater elevations measured between April 2010 and March 2013 ranged from approximately 6 to 16 feet MLLW (AMEC 2017 Figure 20). The highest groundwater elevations were observed at MW-03 and MW-11, located in the northwest portion of the Landfill, ranged between approximately 13 feet MLLW in the fall and approximately 16 feet MLLW in the spring, representing the high groundwater elevation. The lowest groundwater elevations were observed at MW-07 and PZ-03, located in the southeast portion of the Landfill, ranged between approximately 6 feet MLLW in the fall and approximately 9 feet MLLW in the spring.

The groundwater levels at the monitoring wells across the Landfill show similar seasonal variations and the horizontal gradient at the Landfill remain consistent throughout the year. The average groundwater gradient from the northwest to the southeast corners of the Landfill is approximately 0.004 feet/feet. Groundwater levels also decline towards the edges of the Landfill. For example, groundwater levels at MW-08 (located near the center of the Landfill) ranged between approximately 11 feet MLLW in the fall and 13 feet MLLW in the spring, while groundwater levels at MW-09 (located near the northeast edge of the Landfill) ranged between approximately 10 feet MLLW in the fall and 11 feet MLLW in the spring. The average groundwater gradient from the center of the

Landfill towards Padilla Bay at the northeast edge of the Landfill is approximately 0.01 feet/feet. The distribution of groundwater elevations generally follows the Landfill's topography. In general, the Landfill's groundwater flow direction is observed to be from the topographic high in the northwest or center of the Landfill towards the southeast and the Landfill's edges.

The average annual precipitation in Anacortes, Washington is 28.96 inches/year (NOAA 2025). The percentage of precipitation that infiltrates into the groundwater as recharge depends on several factors, including the type of Landfill cover material, topography, vegetation, and local climate conditions. Recharge for the site has not been quantified.

Based on drilling logs (AMEC 2017 Appendix F), the soils encountered at and below observed water levels are primarily unconsolidated silty sands, with some occurrences of silts, silts with sand, and poorly graded sands with silt and gravel. Site-specific hydraulic conductivity and porosity values are not available however literature hydraulic conductivity and porosity values for the observed unconsolidated sediments at the Landfill are presented below in **Table 1**.

Table 1: Literature Ranges of Hydraulic Conductivity and Porosity Values for Unconsolidated Sediments

Material	Porosity (--)	Hydraulic Conductivity (feet/day)
Silt/Silt with Sand	0.35 – 0.5	0.0028 – 0.28
Silty Sand	0.1 – 0.2	0.028 – 2.8
Poorly Graded Sand with Silt and Gravel	0.2 – 0.3	2.8 – 280

Source: Fetter, C.W. and Kreamer, D. 2022. Applied Hydrogeology. 5th edition, Waveland Press.

3 MODELING APPROACH

Data from the AMEC Environment & Infrastructure, Inc. (AMEC) Final Remedial Investigation/Feasibility Study Report was used to develop a simple modeling approach, including groundwater elevations, topography, and soils observed at the Landfill (AMEC, 2017). The groundwater flow model is a simplified 100-foot section of the Landfill.

The modeling approach plan and cross-section views of the model are shown in **Figure 1** and depict a rectangular section of the Landfill from the center of the Landfill to the toe. The dewatering trench is simulated parallel to the toe to capture groundwater flow from the center of the Landfill to the toe during planned soil removal and capping. In the cross-section view in **Figure 1**, the top and bottom of the model are flat, with the top representing the land surface at 30 feet MLLW and the bottom of the model at 0 MLLW. With this horizontal continuous layer, groundwater will flow horizontally towards the active dewatering trench.

The modeling approach assumes a uniform initial groundwater elevation outside of a dewatering trench, which is also set at the maximum observed groundwater elevation. The center of the Landfill is kept at a constant maximum groundwater elevation, representing high water levels in the center of the Landfill maintained by recharge at the site. Using the high groundwater elevation provides a more conservative approach by

representing the greatest volume of water observed at the site. The bottom of the dewatering trench is 0 ft WLLM, representing the planned excavation depth, and the water elevation in the dewatering trench is set to 5 ft MLLW, representing target water level in the dewatering trench.

As illustrated in the modeling approach cross-section view on **Figure 1**, the drawdown uphill of the trench is expected to eventually stabilize during dewatering. The drawdown on the Landfill toe side of the trench is expected to be dewatered as there is not an ongoing water source at the toe of the Landfill.

4 NUMERICAL MODEL CONSTRUCTION

The groundwater flow model was constructed using Groundwater Vistas Version 8 (ESI, 2020) and employed MODFLOW-USG-Transport version 2.01.1 (Panday et al. 2013 and Panday 2024) for developing and simulating numerical flow within a groundwater flow system. The model domain represents a 100-foot section of the Landfill from the center of the Landfill to the toe and covers an area of 32,000 feet^2 with 10 rows and 32 columns of uniform 10-foot by 10-foot cells with one 30-foot layer, as shown on **Figure 2**. The width of the model domain is 100 feet, representing a unit section of a dewatering trench, and the length of the model domain is 320 feet, representing a section of the Landfill from the center to the toe. The top of the model is set to 30 feet MLLW to reflect the highest observed ground surface elevation at the Landfill and the bottom of the model is set to 0 feet MLLW, 5-feet below the proposed dewatering trench depth.

The initial groundwater level is 16 feet MLLW, representing high groundwater conditions prior to dewatering. A Constant Head Boundary condition (CHB) is used to simulate the static groundwater elevation at the Landfill center, representing the highest groundwater elevation observed at the Landfill of 16 feet MLLW, observed at monitoring well MW-03 in June 2010 (AMEC 2017). The constant head boundary extends 100 feet along the width of the model domain. At the opposite end of the model domain a no flow boundary condition simulates the Landfill toe, representing no recharge A Drain Boundary condition (DRN), located 200 feet from the constant head boundary, simulates the dewatering trench with the stage set to 5 feet MLLW, representing the planned water level in the dewatering trench, and the hydraulic conductivity of 1,000,000 feet/day to allow groundwater to flow freely into the drain boundary condition. The drain boundary condition is one model cell wide (10 feet), the bed thickness is 1 foot, and DRN cells representing the dewatering trench spans the model width of 100 feet. No flow boundary conditions extend along the top and bottom of the model domain. Groundwater flows horizontally from the constant head boundary to the dewatering trench and from the toe to the dewatering trench. For simplicity, the model does not simulate recharge, however, the CHB represents the effect of recharge at the center of the Landfill.

The assumed model parameters represent the range of hydraulic conductivity values and porosity values for soil types observed at the site. The horizontal hydraulic conductivity was simulated over a range of 10^{-4} cm/s (0.2835 feet/day) and 10^{-3} cm/s (2.835 feet/day) with a vertical-to-horizontal anisotropy ratio of 0.1. Specific yield is simulated as equal to porosity and ranges from 0.4 to 0.45. Specific storage was simulated to 0.0001 feet^{-1} (Fetter, 2022). The simulated model boundary conditions and parameters are summarized in **Table 2**.

Table 2: Model Boundary Conditions and Hydraulic Parameters

Parameter	Value	Units
Hydrogeologic Properties		

Parameter	Value	Units
Low Horizontal Hydraulic Conductivity (K_h)	0.2835	feet/day
High Horizontal Hydraulic Conductivity (K_h)	2.835	feet/day
Low Specific Yield (Sy) and Porosity (n)	0.4	--
High Specific Yield (Sy) and Porosity (n)	0.45	--
Specific Storage (Ss)	0.0001	--/feet
Boundary Conditions		
Constant Head Boundary Condition Head	16	feet
Drain Boundary Condition Stage	5	feet
Drain Boundary Condition Length	100	feet
Drain Boundary Condition Width	10	feet
Drain Boundary Condition Hydraulic Conductance	100,000,000	$feet^2$/day
Initial Conditions		
Initial Water Level in Groundwater	16	feet

Four cases were evaluated as part of this assessment to provide a range of possible results in lieu of having Site-specific hydraulic parameters. All four cases were simulated under transient conditions over a 48-hour period to evaluate flux into the dewater trench in the first 48 hours. These four cases along with the initial groundwater elevation and the CHB set to the maximum observed water level elevation, represent a conservative approach. Each case is summarized as:

- Low K_H and Low Sy/n,
- Low K_H and High Sy/n,
- High K_H and Low Sy/n, and
- High K_H and Low Sy/n.

5 MODEL RESULTS

The groundwater model was developed to estimate groundwater flux into the dewatering trench. The four simulation cases use high groundwater elevation conditions and a range of hydraulic conductivity and specific yield values. **Table 3** below summarizes the average predicted discharge rates and cumulative volumes during select times (hours) throughout the simulations. The predicted average discharge rate for the first hour (Hour 1) of

active trench dewatering ranged between approximately 5 and 49 gallons per minute (gpm) with cumulative volumes of produced water estimated to be between approximately 300 and 2,900 gallons across the four cases. The predicted flow rate decreases with time and after 48 hours, the average discharge rate ranged between approximately 4 and 16 gpm with cumulative volumes of produced water estimated to be between approximately 12,600 and 71,000 gallons.

Table 3: Simulation Results – Flow rates for 100-ft Section of Dewatering Trench

Case	Average Discharge for Hour 1 for 100 feet of Trench (gpm)	Average Discharge for Hour 8 for 100 feet of Trench (gpm)	Average Discharge for Hour 48 for 100 feet of Trench (gpm)	Cumulative Discharge after 1 Hour for 100 feet of Trench (gallons)	Cumulative Discharge over 8 Hours for 100 feet of Trench (gallons)	Cumulative Discharge over 48 Hours for 100 feet of Trench (gallons)
Low K_h, Low Sy Case	5.1	4.9	3.8	309	2,404	12,646
Low K_h, High Sy Case	5.1	4.9	3.9	309	2,413	12,849
High K_h, Low Sy Case	48	32.9	14.8	2,894	19,031	67,966
High K_h, High Sy Case	49	34.2	15.6	2,915	19,478	71,039

Notes:
Low horizontal hydraulic conductivity (Kh) = 0.2835 feet/day = 10^{-4} centimeter/second
High horizontal hydraulic conductivity (Kh) = 2.835 feet/day = 10^{-3} centimeter/second
Low specific yield (Sy) = 0.4
High specific yield (Sy) = 0.45

Figures 3 shows the predicted flux into a 100-ft section of the dewatering trench and the predicted groundwater elevations 50 feet from the trench towards the Landfill center and Landfill toe (shown on **Figures 1** and **2**) over the 48-hour simulation period for each case. For the two low horizontal hydraulic conductivity cases, the simulated discharge rates are similar with initial discharge rates at approximately 5 gpm. For the two Low horizontal hydraulic conductivity cases, discharge rates remained relatively constant, declining only slightly to approximately 4 gpm after 48 hours. The simulated discharge rates for the two high horizontal hydraulic conductivity cases are similar with initial discharge rates at approximately 50 gpm; discharge rates rapidly decreased in the first 48 hours to approximately 15 gpm. The rate-of-change (slope) of the two High Kh case's discharge ratesis initially relatively steep then progressively flattens as groundwater levels move towards steady-state conditions. The simulated groundwater elevations 50 feet in either direction from the dewatering trench remain relatively constant at the initial groundwater elevation of 16.0 feet MLLW during 48-hour simulation of the two low hydraulic conductivity cases. The two high hydraulic conductivity cases result in a minor decline in water levels from 16.0 feet MLLW to approximately 15.9 feet MLLW after 48 hours.

Figure 4 shows the predicted cumulative discharge for the 48-hour simulation period for each case. For the two low horizontal hydraulic conductivity cases, the predicted cumulative discharges steadily increased over 48 hours.

For the two high horizontal hydraulic conductivity cases, the predicted cumulative discharges initially increase rapidly then progressively attenuate as the discharge rates stabilize. The high hydraulic conductivity cases result in greater volumes of cumulate discharge over the simulated 48-hour period.

The predicted average discharges and cumulative volume results were not sensitive to the specific yield compared to hydraulic conductivity, suggesting the groundwater flow system is more sensitive to hydraulic conductivity. More accuracy in results could be obtained by collecting site-specific hydraulic conductivity data.

6 MODEL LIMITATIONS

Several simplifications, assumptions, and approximations have been made in developing the groundwater flow model at the Landfill. The model was developed to simulate the planned dewatering trench near the Landfill's toe to predict groundwater flux into the trench. A range of hydrogeological parameters were simulated, representing the heterogeneity observed at the Landfill. In addition, the highest observed groundwater level was simulated, resulting in a more conservative (i.e., highest dewatering flow) predictive model. The model was not calibrated to observed conditions and the range of hydraulic properties stimulated result in a range of predicted flow rates into the proposed dewatering trench. The groundwater flow model was developed to meet the modeling objectives and should not be used beyond this purpose.

The assumptions inherent to the groundwater flow model and limitations of the modeling results can be summarized as:

- Representation of the model domain by discrete finite-volumes, approximation of groundwater flow by the continuity equation and Darcy's Law.
- The groundwater flow model represents a 100-foot section of the Landfill. This is an approximation of conditions at the sight and represents a simplified flow system, which horizontal flow into the simulated dewatering trench. The entire Landfill was not simulated.
- The groundwater flow model was not calibrated to observed site conditions.
- The groundwater flow system is simulated as a transient model over a 24-hour period, with constant recharge from the CHB, representing the seasonal high water level condition. Actual water level elevations at the site vary seasonally and throughout the Landfill.
- The hydrostratigraphy is simulated as one continuous-horizontal-homogenous 30-foot thick layer. The hydrostratigraphy observed at the Landfill varies and is not constant.
- A range of hydraulic conductivity values and specific yield values are simulated for each case to bracket an average condition. Actual hydraulic parameters will vary spatially and may be outside of the range of simulated hydraulic parameters.
- The model does not simulate recharge directly, even though precipitation and subsequent recharge can occur at the Landfill during dewatering. The CHB simulates indirect recharge to groundwater.
- The predicted groundwater elevations and groundwater discharge rates into the simulated dewatering trench are based on a simplified 100-foot Landfill section and not on site-specific measurements. Actual groundwater elevations and groundwater discharge rates to the dewatering trench will vary seasonally and spatially within the Landfill.

7 REFERENCES

AMEC Environnent & Infrastructure, Inc. (AMEC), 2017. Final Remedial Investigation/Feasibility Study Report. Prepared for Whitmarsh Landfill PLP Group. February.

Environmental Simulations, Inc. (ESI), 2020. Guide to Using Groundwater Vistas Version 8, 2000-2020, by James O. Rumbaugh and Douglas B. Rumbaugh. http://www.groundwatermodels.com.

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Panday, Sorab, Langevin, C.D., Niswonger, R.G., Ibaraki, Motomu, and Hughes, J.D., 2013, MODFLOW-USG version 1: An unstructured grid version of MODFLOW for simulating groundwater flow and tightly coupled processes using a control volume finite-difference formulation: U.S. Geological Survey Techniques and Methods, book 6, chap. A45, 66 p., https://doi.org/10.3133/tm6A45

Panday, S., 2024. USG-Transport Version 2.4.0: Transport and Other Enhancements to MODFLOW-USG, GSI Environmental, July. http://www.gsi-net.com/en/software/free-software/USG- Transport.html

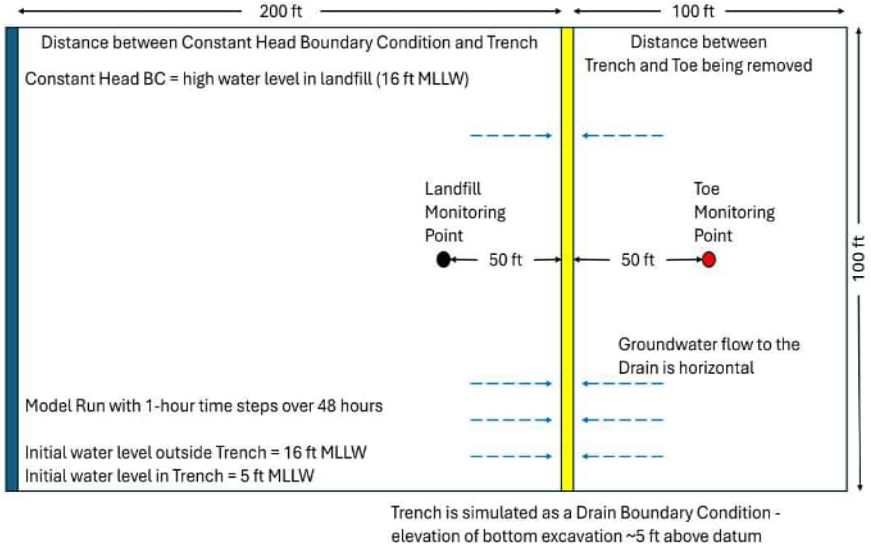
NOAA. "U.S. Climate Normals." National Centers for Environmental Information. Accessed March 27, 2025. https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-annualseasonal&timeframe=30&location=WA&station=USC00450176.

Attachments: Figure 1 – Modeling Approach

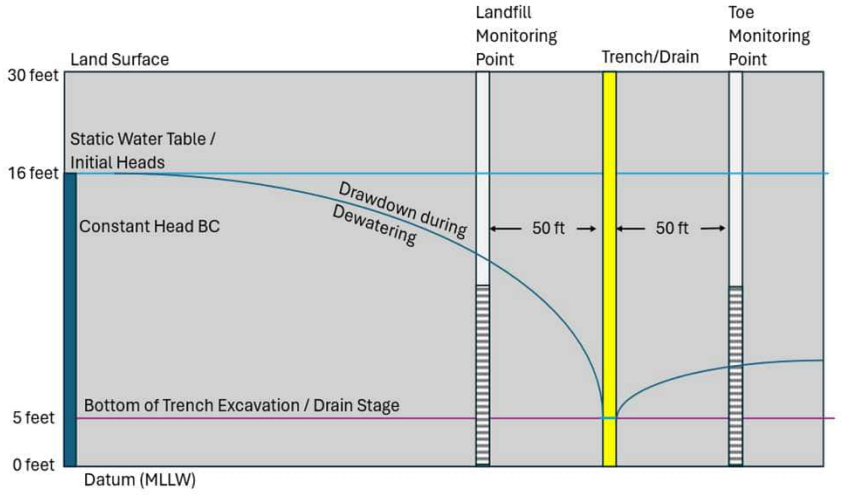
Figure 2 – Numerical Model and Boundary Conditions

Figures 3 and 4 – Model Results

Plan View



Cross-Section View



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Koorus Tahghighi
WSP USA, INC

CONSULTANT

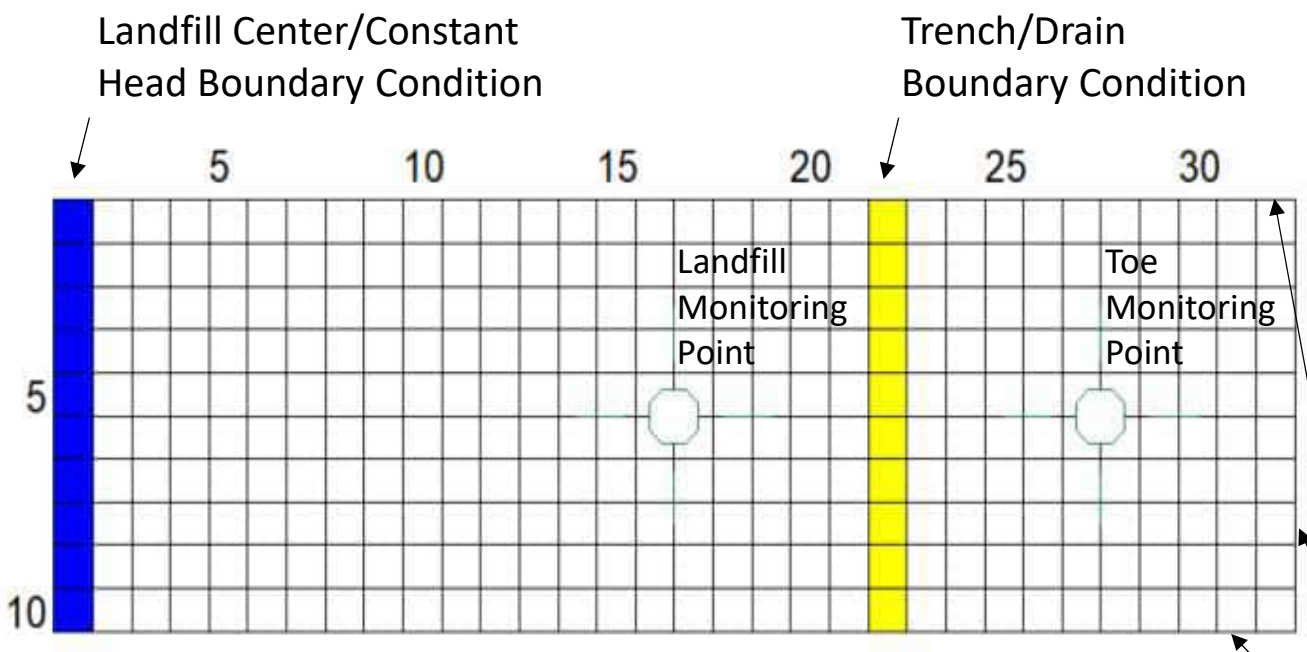
YYYY-MM-DD	4/8/2025
DESIGNED	JR
PREPARED	JR
REVIEWED	AH
APPROVED	KR

PROJECT
WHITMARSH LANDFILL
ANACORTES, WASHINGTON

TITLE
MODELING APPROACH
PLAN AND CROSS-SECTION VIEWS

PROJECT NO.	REV.	FIGURE
US0041081.0037	A	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
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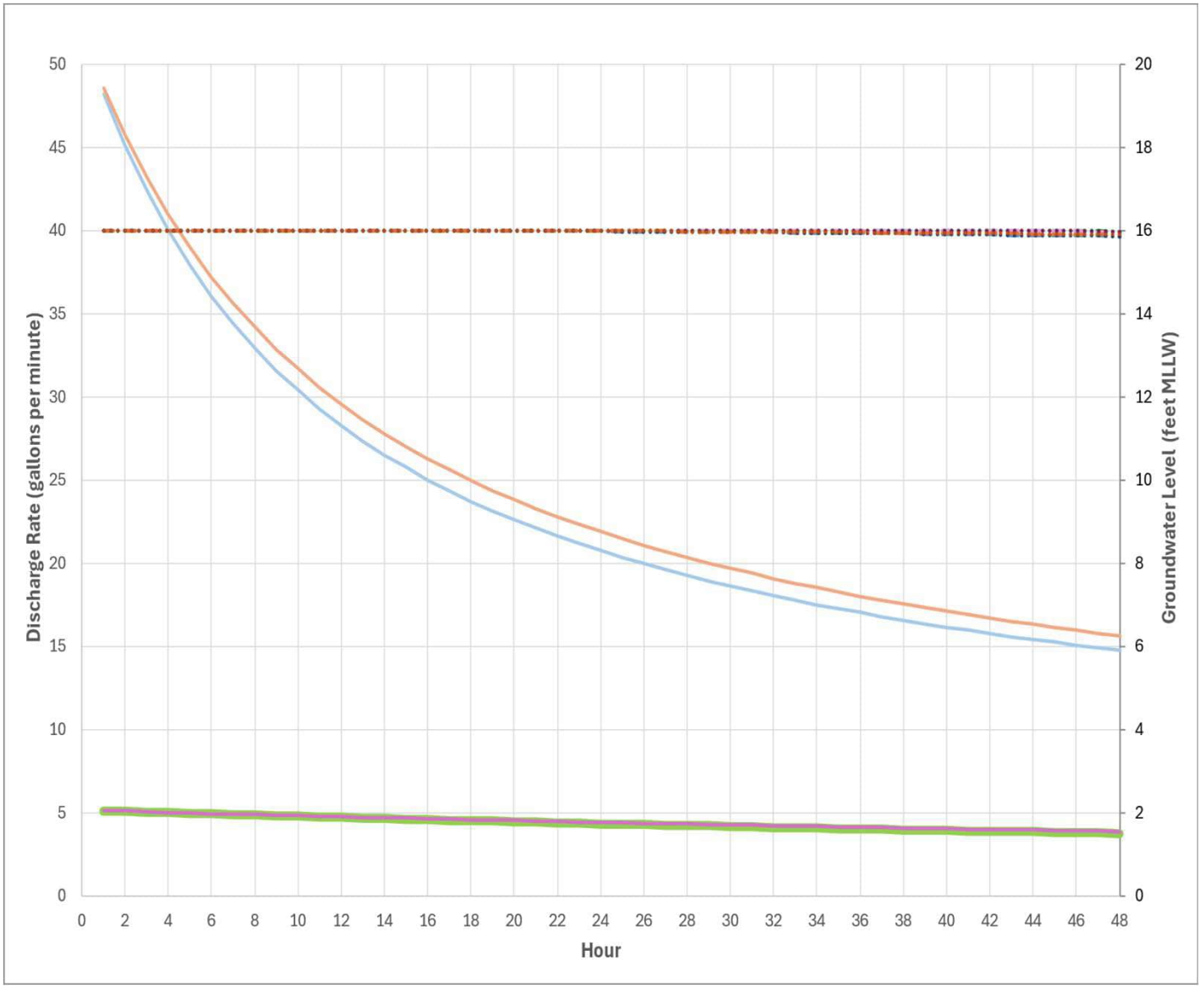
YYYY-MM-DD	4/8/2025
DESIGNED	JR
PREPARED	JR
REVIEWED	AH
APPROVED	KR

PROJECT
WHITMARSH LANDFILL
ANACORTES, WASHINGTON

TITLE
NUMERICAL MODEL DOMAIN AND BOUNDARY CONDITIONS

PROJECT NO. US0041081.0037 | REV. A | FIGURE 2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
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NOTES

1. Low Kh = 0.01181 ft/hr = 0.2835 ft/day = 10-4 cm/s
2. High Kh = 0.1181 ft/hr = 2.835 ft/day = 10-3 cm/s
3. Low Sy/n = 0.4
4. High Sy/n = 0.45
5. Landfill Monitoring Point is 50 feet Uphill of Trench
6. Toe Monitoring Point is 50 feet Downhill of Trench

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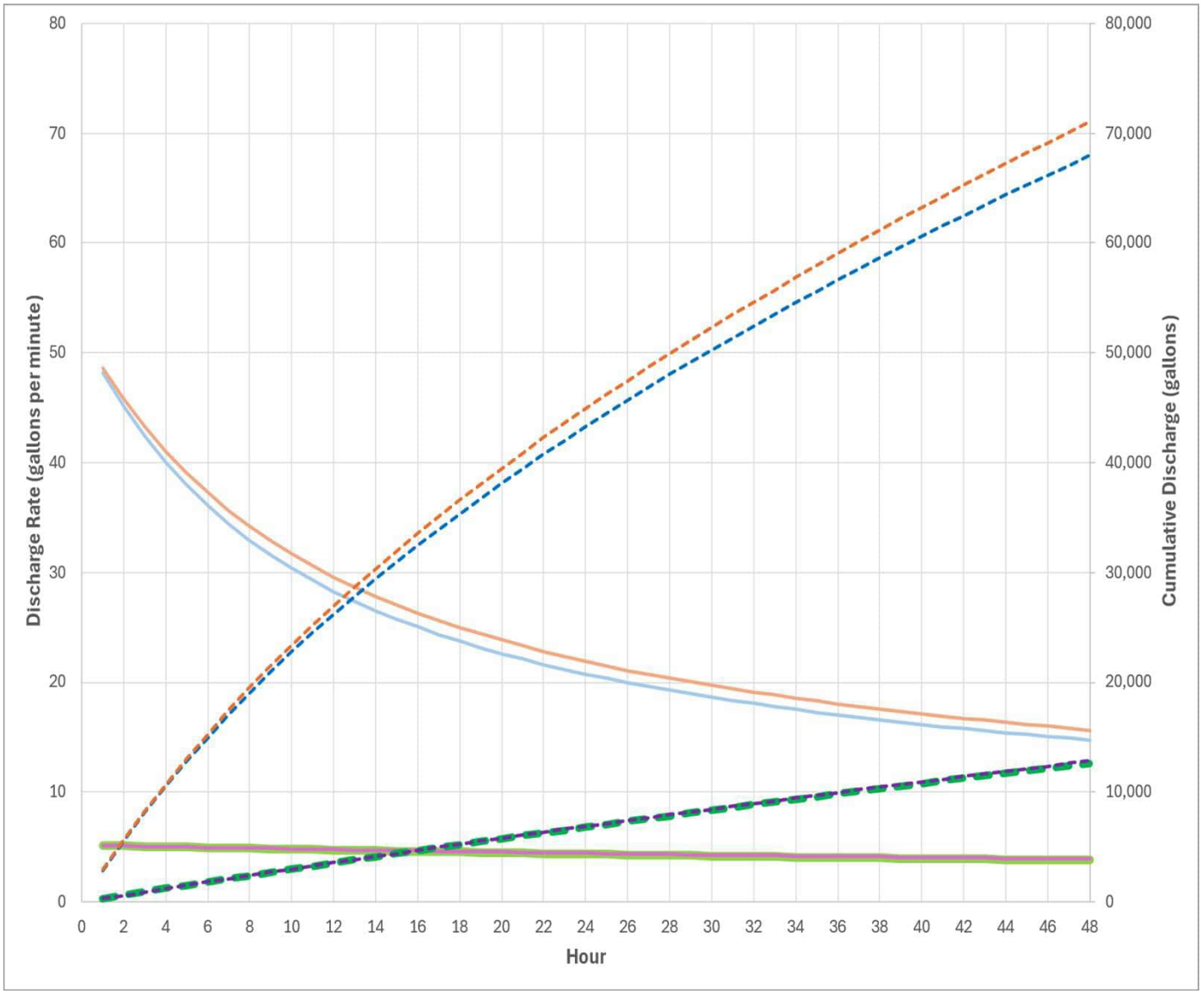
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DESIGNED	JR
PREPARED	JR
REVIEWED	AH
APPROVED	KR

PROJECT
WHITMARSH LANDFILL
ANACORTES, WASHINGTON

TITLE
MODEL RESULTS -
DISCHARGE RATE AND GROUNDWATER LEVEL OVER TIME FOR 100-FOOT SECTION OF DEWATERING TRENCH

PROJECT NO.	REV.	FIGURE
US0041081.0037	A	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
1 in
0



NOTES
1. Low Kh = 0.01181 ft/hr = 0.2835 ft/day = 1E-4 cm/s
2. High Kh = 0.1181 ft/hr = 2.835 ft/day = 1E-3 cm/s
3. Low Sy/n = 0.4
4. High Sy/n = 0.45

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Koorus Tahghighi
WSP USA, INC

CONSULTANT

YYYY-MM-DD	4/8/2025
DESIGNED	JR
PREPARED	JR
REVIEWED	AH
APPROVED	KR

PROJECT
WHITMARSH LANDFILL
ANACORTES, WASHINGTON

TITLE
MODEL RESULTS -
DISCHARGE RATE AND CUMULATIVE DISCHARGE OVER TIME FOR 100-FOOT SECTION OF DEWATERING TRENCH

PROJECT NO. US0041081.0037 | REV. A | FIGURE 4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
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CALCULATIONS

Date: May 21, 2025
Project No.: US0041081.0037 Task 04
Subject: Hydrostatic Uplift of the Cover System
Project Short Title: Whitmarsh Landfill Cover Design

Made by: KWW
Checked by: KT

Purpose:
Determine the the maximum hydrostatic elevation head that the proposed cover system weight will counteract before dewatering needs to be activated.

Assumptions: Hydrostatic uplift pressure (bouyancy) on the cover system will occur when the tidal elevation outside the landfill and/or the groundwater elevation within the landfill exceeds the elevation of the cover system. This hydrostatic uplift pressure acts perpendicular to the impermeable surface it is acting on. This hydrostatic pressure will therefore be counteracted by the normal load of the cover system weight above the geosynthetic clay liner with a geofilm (GCLL) as shown in figure 1 below. The proposed cover system is shown on figure 2 below. The maximum hydrostatic uplift pressure will occur at the toe of the slopes where the elevation of the final cover system is at the lowest point below the tidal elevation or groundwater elevation. There are four slopes proposed at the toe of the landfill:

Drawing C-7 (Ref 1)	Toe Slope		Toe Elevation (ft MLLW)	
Location (approx.)	Percent	Degrees	Lowest	Highest
0+00 to 6+50	25	14.04	6	6
6+50 to 23+25	20	11.30	7	10
23+25 to 24+90	20 to 33	11.30 to 18.43	8	10
24+90 to 35+90	33	18.43	10	19

Figure 1

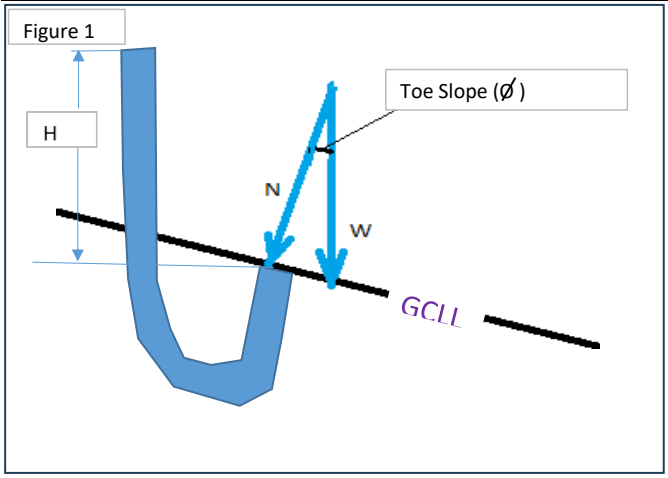
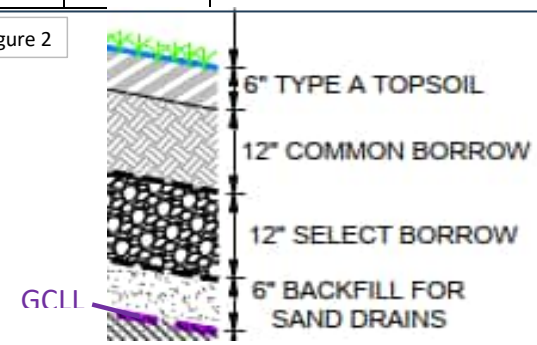


Figure 2



Unit weight of Cover soils = 125 pounds per cubic foot (pcf)

References:
1. WSP USA, Inc. , 2024, Remedial Action , March Point (WhitMarsh) Landfill. Anacortes, Skagit County, WA, Issued for Bid Drawings, Nov. 20

Solution:
1. Calculate the Weight (W) of the cover system = Minimum Cover system thickness x unit weight of cover soils =
3 feet x 125 pcf = 375 psf

2. Calculate the Normal load due the weight of the cover thickeness = $N = W * \cos(\phi)$
3. Calculate the Equivalent Hydraulic Head, H that will be counteracted by the normal load, N

$$H = \frac{N}{\gamma water}$$ where $\gamma water$ = 62.4 pcf

4. Calculate the maximum elevation of the tide outside the landfill or the groundwater (GW) level inside the landfill that the cover system can withstand before the dewatering needs to be activated. This is calcuated by adding H to the toe elevation along the edge of the landfill.

5. The calculated values in solution steps 2 through 4 are provided in the table below:

Drawing C-7 (Ref 1) Location (approx.)	Maximum slope (Degrees)	Normal Load N (psf)	Equivalent Hydraulic pressure, H (ft of head)	Maximum Tide or GW Elevation	
				@lowest toe elev	@highest toe elev
0+00 to 6+50	14.04	364	5.8	11.8	11.8
6+50 to 23+25	11.30	368	5.9	12.9	15.9
23+25 to 24+90	18.43	356	5.7	13.7	15.7
24+90 to 35+90	18.43	356	5.7	15.7	24.7

Conclusions:

Per Reference 1, the high tide level is 10.27' MLLW which is below the maximum tide elevations the cover system can counteract, therefore, tidal fluctuations should not lift the cover system unless the tides exceed 11.8 ft MLLW (e.g. King Tides).

The high groundwater levels measured at the northwest end of the landfill (see section C Drawing C-11), exceed the maximum elevations that can be counteracted by the weight of the cover system. Therefore, dewatering will be required to maintain the groundwater level to less than 11.8 ft MLLW along the toe of the landfill from Stations 0 to 6+50.

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/1/2025	6:00	0.47	5:47	20:22	Potential Work Window
5/1/2025	6:30	-1.32	5:47	20:22	Potential Work Window
5/1/2025	7:00	-2.37	5:47	20:22	Potential Work Window
5/1/2025	7:30	-2.48	5:47	20:22	Potential Work Window
5/1/2025	8:00	-1.68	5:47	20:22	Potential Work Window
5/1/2025	8:30	-0.03	5:47	20:22	Potential Work Window
5/1/2025	9:00	2.25	5:47	20:22	Potential Work Window
5/1/2025	9:30	4.65	5:47	20:22	Potential Work Window
5/1/2025	10:00	6.69	5:47	20:22	Potential Work Window
5/2/2025	13:00	7.49	5:45	20:23	Potential Work Window
5/2/2025	13:30	7.09	5:45	20:23	Potential Work Window
5/2/2025	14:00	6.94	5:45	20:23	Potential Work Window
5/2/2025	14:30	7.00	5:45	20:23	Potential Work Window
5/2/2025	15:00	7.26	5:45	20:23	Potential Work Window
5/2/2025	15:30	7.50	5:45	20:23	Potential Work Window
5/2/2025	16:00	7.36	5:45	20:23	Potential Work Window
5/2/2025	16:30	6.74	5:45	20:23	Potential Work Window
5/2/2025	17:00	5.67	5:45	20:23	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/3/2025	6:00	4.15	5:43	20:25	Potential Work Window
5/3/2025	6:30	2.70	5:43	20:25	Potential Work Window
5/3/2025	7:00	1.17	5:43	20:25	Potential Work Window
5/3/2025	7:30	-0.12	5:43	20:25	Potential Work Window
5/3/2025	8:00	-0.83	5:43	20:25	Potential Work Window
5/3/2025	8:30	-0.85	5:43	20:25	Potential Work Window
5/3/2025	9:00	-0.18	5:43	20:25	Potential Work Window
5/3/2025	9:30	1.20	5:43	20:25	Potential Work Window
5/3/2025	10:00	3.09	5:43	20:25	Potential Work Window
5/3/2025	10:30	5.04	5:43	20:25	Potential Work Window
5/3/2025	11:00	6.70	5:43	20:25	Potential Work Window
5/3/2025	11:30	7.94	5:43	20:25	Potential Work Window
5/4/2025	13:30	7.83	5:42	20:26	Potential Work Window
5/4/2025	14:00	7.14	5:42	20:26	Potential Work Window
5/4/2025	14:30	6.57	5:42	20:26	Potential Work Window
5/4/2025	15:00	6.13	5:42	20:26	Potential Work Window
5/4/2025	15:30	5.91	5:42	20:26	Potential Work Window
5/4/2025	16:00	5.97	5:42	20:26	Potential Work Window
5/4/2025	16:30	6.09	5:42	20:26	Potential Work Window
5/4/2025	17:00	6.04	5:42	20:26	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/5/2025	6:00	5.40	5:40	20:28	Potential Work Window
5/5/2025	6:30	5.14	5:40	20:28	Potential Work Window
5/5/2025	7:00	4.57	5:40	20:28	Potential Work Window
5/5/2025	7:30	3.67	5:40	20:28	Potential Work Window
5/5/2025	8:00	2.59	5:40	20:28	Potential Work Window
5/5/2025	8:30	1.63	5:40	20:28	Potential Work Window
5/5/2025	9:00	1.05	5:40	20:28	Potential Work Window
5/5/2025	9:30	0.94	5:40	20:28	Potential Work Window
5/5/2025	10:00	1.41	5:40	20:28	Potential Work Window
5/5/2025	10:30	2.54	5:40	20:28	Potential Work Window
5/5/2025	11:00	4.09	5:40	20:28	Potential Work Window
5/5/2025	11:30	5.67	5:40	20:28	Potential Work Window
5/6/2025	12:00	7.03	5:39	20:29	Potential Work Window
5/6/2025	14:00	7.80	5:39	20:29	Potential Work Window
5/6/2025	14:30	6.86	5:39	20:29	Potential Work Window
5/6/2025	15:00	5.86	5:39	20:29	Potential Work Window
5/6/2025	15:30	4.97	5:39	20:29	Potential Work Window
5/6/2025	16:00	4.29	5:39	20:29	Potential Work Window
5/6/2025	16:30	4.01	5:39	20:29	Potential Work Window
5/6/2025	17:00	4.20	5:39	20:29	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/7/2025	6:00	4.05	5:37	20:30	Potential Work Window
5/7/2025	6:30	4.72	5:37	20:30	Potential Work Window
5/7/2025	7:00	5.28	5:37	20:30	Potential Work Window
5/7/2025	7:30	5.57	5:37	20:30	Potential Work Window
5/7/2025	8:00	5.44	5:37	20:30	Potential Work Window
5/7/2025	8:30	4.89	5:37	20:30	Potential Work Window
5/7/2025	9:00	4.08	5:37	20:30	Potential Work Window
5/7/2025	9:30	3.34	5:37	20:30	Potential Work Window
5/7/2025	10:00	2.88	5:37	20:30	Potential Work Window
5/7/2025	10:30	2.82	5:37	20:30	Potential Work Window
5/7/2025	11:00	3.29	5:37	20:30	Potential Work Window
5/7/2025	11:30	4.34	5:37	20:30	Potential Work Window
5/8/2025	12:00	5.67	5:35	20:32	Potential Work Window
5/8/2025	12:30	6.88	5:35	20:32	Potential Work Window
5/8/2025	13:00	7.78	5:35	20:32	Potential Work Window
5/8/2025	14:30	7.36	5:35	20:32	Potential Work Window
5/8/2025	15:00	6.12	5:35	20:32	Potential Work Window
5/8/2025	15:30	4.69	5:35	20:32	Potential Work Window
5/8/2025	16:00	3.40	5:35	20:32	Potential Work Window
5/8/2025	16:30	2.42	5:35	20:32	Potential Work Window
5/8/2025	17:00	1.91	5:35	20:32	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/9/2025	6:00	1.51	5:34	20:33	Potential Work Window
5/9/2025	6:30	2.64	5:34	20:33	Potential Work Window
5/9/2025	7:00	3.94	5:34	20:33	Potential Work Window
5/9/2025	7:30	5.15	5:34	20:33	Potential Work Window
5/9/2025	8:00	6.10	5:34	20:33	Potential Work Window
5/9/2025	8:30	6.62	5:34	20:33	Potential Work Window
5/9/2025	9:00	6.61	5:34	20:33	Potential Work Window
5/9/2025	9:30	6.14	5:34	20:33	Potential Work Window
5/9/2025	10:00	5.47	5:34	20:33	Potential Work Window
5/9/2025	10:30	4.92	5:34	20:33	Potential Work Window
5/9/2025	11:00	4.67	5:34	20:33	Potential Work Window
5/9/2025	11:30	4.76	5:34	20:33	Potential Work Window
5/10/2025	12:00	5.33	5:33	20:34	Potential Work Window
5/10/2025	12:30	6.27	5:33	20:34	Potential Work Window
5/10/2025	13:00	7.19	5:33	20:34	Potential Work Window
5/10/2025	13:30	7.78	5:33	20:34	Potential Work Window
5/10/2025	14:00	7.92	5:33	20:34	Potential Work Window
5/10/2025	14:30	7.50	5:33	20:34	Potential Work Window
5/10/2025	15:00	6.49	5:33	20:34	Potential Work Window
5/10/2025	15:30	4.98	5:33	20:34	Potential Work Window
5/10/2025	16:00	3.23	5:33	20:34	Potential Work Window
5/10/2025	16:30	1.66	5:33	20:34	Potential Work Window
5/10/2025	17:00	0.57	5:33	20:34	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/11/2025	6:00	-0.52	5:31	20:36	Potential Work Window
5/11/2025	6:30	0.24	5:31	20:36	Potential Work Window
5/11/2025	7:00	1.72	5:31	20:36	Potential Work Window
5/11/2025	7:30	3.53	5:31	20:36	Potential Work Window
5/11/2025	8:00	5.23	5:31	20:36	Potential Work Window
5/11/2025	8:30	6.61	5:31	20:36	Potential Work Window
5/11/2025	9:00	7.51	5:31	20:36	Potential Work Window
5/11/2025	9:30	7.85	5:31	20:36	Potential Work Window
5/11/2025	10:00	7.64	5:31	20:36	Potential Work Window
5/11/2025	10:30	7.08	5:31	20:36	Potential Work Window
5/11/2025	11:00	6.48	5:31	20:36	Potential Work Window
5/11/2025	11:30	6.12	5:31	20:36	Potential Work Window
5/12/2025	12:00	6.04	5:30	20:37	Potential Work Window
5/12/2025	12:30	6.24	5:30	20:37	Potential Work Window
5/12/2025	13:00	6.76	5:30	20:37	Potential Work Window
5/12/2025	13:30	7.37	5:30	20:37	Potential Work Window
5/12/2025	14:00	7.66	5:30	20:37	Potential Work Window
5/12/2025	14:30	7.46	5:30	20:37	Potential Work Window
5/12/2025	15:00	6.75	5:30	20:37	Potential Work Window
5/12/2025	15:30	5.53	5:30	20:37	Potential Work Window
5/12/2025	16:00	3.88	5:30	20:37	Potential Work Window
5/12/2025	16:30	2.02	5:30	20:37	Potential Work Window
5/12/2025	17:00	0.34	5:30	20:37	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/13/2025	5:30	-0.64	5:28	20:39	Potential Work Window
5/13/2025	6:00	-1.36	5:28	20:39	Potential Work Window
5/13/2025	6:30	-1.24	5:28	20:39	Potential Work Window
5/13/2025	7:00	-0.35	5:28	20:39	Potential Work Window
5/13/2025	7:30	1.26	5:28	20:39	Potential Work Window
5/13/2025	8:00	3.33	5:28	20:39	Potential Work Window
5/13/2025	8:30	5.35	5:28	20:39	Potential Work Window
5/13/2025	9:00	6.97	5:28	20:39	Potential Work Window
5/13/2025	11:30	7.37	5:28	20:39	Potential Work Window
5/14/2025	12:00	6.88	5:27	20:40	Potential Work Window
5/14/2025	12:30	6.69	5:27	20:40	Potential Work Window
5/14/2025	13:00	6.71	5:27	20:40	Potential Work Window
5/14/2025	13:30	6.91	5:27	20:40	Potential Work Window
5/14/2025	14:00	7.24	5:27	20:40	Potential Work Window
5/14/2025	14:30	7.39	5:27	20:40	Potential Work Window
5/14/2025	15:00	7.07	5:27	20:40	Potential Work Window
5/14/2025	15:30	6.24	5:27	20:40	Potential Work Window
5/14/2025	16:00	4.98	5:27	20:40	Potential Work Window
5/14/2025	16:30	3.37	5:27	20:40	Potential Work Window
5/14/2025	17:00	1.58	5:27	20:40	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/15/2025	5:30	0.84	5:26	20:41	Potential Work Window
5/15/2025	6:00	-0.63	5:26	20:41	Potential Work Window
5/15/2025	6:30	-1.47	5:26	20:41	Potential Work Window
5/15/2025	7:00	-1.44	5:26	20:41	Potential Work Window
5/15/2025	7:30	-0.63	5:26	20:41	Potential Work Window
5/15/2025	8:00	0.85	5:26	20:41	Potential Work Window
5/15/2025	8:30	2.84	5:26	20:41	Potential Work Window
5/15/2025	9:00	4.97	5:26	20:41	Potential Work Window
5/15/2025	9:30	6.76	5:26	20:41	Potential Work Window
5/15/2025	10:00	8.00	5:26	20:41	Potential Work Window
5/16/2025	12:00	7.83	5:24	20:42	Potential Work Window
5/16/2025	12:30	7.24	5:24	20:42	Potential Work Window
5/16/2025	13:00	6.92	5:24	20:42	Potential Work Window
5/16/2025	13:30	6.85	5:24	20:42	Potential Work Window
5/16/2025	14:00	6.90	5:24	20:42	Potential Work Window
5/16/2025	14:30	7.04	5:24	20:42	Potential Work Window
5/16/2025	15:00	7.14	5:24	20:42	Potential Work Window
5/16/2025	15:30	6.90	5:24	20:42	Potential Work Window
5/16/2025	16:00	6.18	5:24	20:42	Potential Work Window
5/16/2025	16:30	5.04	5:24	20:42	Potential Work Window
5/16/2025	17:00	3.60	5:24	20:42	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/17/2025	5:30	3.17	5:23	20:44	Potential Work Window
5/17/2025	6:00	1.62	5:23	20:44	Potential Work Window
5/17/2025	6:30	0.16	5:23	20:44	Potential Work Window
5/17/2025	7:00	-0.90	5:23	20:44	Potential Work Window
5/17/2025	7:30	-1.23	5:23	20:44	Potential Work Window
5/17/2025	8:00	-0.76	5:23	20:44	Potential Work Window
5/17/2025	8:30	0.38	5:23	20:44	Potential Work Window
5/17/2025	9:00	2.05	5:23	20:44	Potential Work Window
5/17/2025	9:30	4.05	5:23	20:44	Potential Work Window
5/17/2025	10:00	5.96	5:23	20:44	Potential Work Window
5/17/2025	10:30	7.41	5:23	20:44	Potential Work Window
5/18/2025	13:00	7.49	5:22	20:45	Potential Work Window
5/18/2025	13:30	6.98	5:22	20:45	Potential Work Window
5/18/2025	14:00	6.74	5:22	20:45	Potential Work Window
5/18/2025	14:30	6.66	5:22	20:45	Potential Work Window
5/18/2025	15:00	6.64	5:22	20:45	Potential Work Window
5/18/2025	15:30	6.68	5:22	20:45	Potential Work Window
5/18/2025	16:00	6.63	5:22	20:45	Potential Work Window
5/18/2025	16:30	6.21	5:22	20:45	Potential Work Window
5/18/2025	17:00	5.39	5:22	20:45	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/19/2025	5:30	5.06	5:21	20:46	Potential Work Window
5/19/2025	6:00	4.06	5:21	20:46	Potential Work Window
5/19/2025	6:30	2.87	5:21	20:46	Potential Work Window
5/19/2025	7:00	1.59	5:21	20:46	Potential Work Window
5/19/2025	7:30	0.44	5:21	20:46	Potential Work Window
5/19/2025	8:00	-0.27	5:21	20:46	Potential Work Window
5/19/2025	8:30	-0.28	5:21	20:46	Potential Work Window
5/19/2025	9:00	0.41	5:21	20:46	Potential Work Window
5/19/2025	9:30	1.63	5:21	20:46	Potential Work Window
5/19/2025	10:00	3.31	5:21	20:46	Potential Work Window
5/19/2025	10:30	5.19	5:21	20:46	Potential Work Window
5/19/2025	11:00	6.84	5:21	20:46	Potential Work Window
5/19/2025	11:30	7.98	5:21	20:46	Potential Work Window
5/20/2025	13:30	7.55	5:20	20:48	Potential Work Window
5/20/2025	14:00	6.70	5:20	20:48	Potential Work Window
5/20/2025	14:30	6.02	5:20	20:48	Potential Work Window
5/20/2025	15:00	5.60	5:20	20:48	Potential Work Window
5/20/2025	15:30	5.38	5:20	20:48	Potential Work Window
5/20/2025	16:00	5.34	5:20	20:48	Potential Work Window
5/20/2025	16:30	5.48	5:20	20:48	Potential Work Window
5/20/2025	17:00	5.58	5:20	20:48	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/21/2025	5:30	4.98	5:19	20:49	Potential Work Window
5/21/2025	6:00	5.07	5:19	20:49	Potential Work Window
5/21/2025	6:30	4.86	5:19	20:49	Potential Work Window
5/21/2025	7:00	4.38	5:19	20:49	Potential Work Window
5/21/2025	7:30	3.62	5:19	20:49	Potential Work Window
5/21/2025	8:00	2.72	5:19	20:49	Potential Work Window
5/21/2025	8:30	1.88	5:19	20:49	Potential Work Window
5/21/2025	9:00	1.43	5:19	20:49	Potential Work Window
5/21/2025	9:30	1.60	5:19	20:49	Potential Work Window
5/21/2025	10:00	2.34	5:19	20:49	Potential Work Window
5/21/2025	10:30	3.55	5:19	20:49	Potential Work Window
5/21/2025	11:00	5.14	5:19	20:49	Potential Work Window
5/21/2025	11:30	6.78	5:19	20:49	Potential Work Window
5/22/2025	14:00	7.21	5:18	20:50	Potential Work Window
5/22/2025	14:30	5.85	5:18	20:50	Potential Work Window
5/22/2025	15:00	4.49	5:18	20:50	Potential Work Window
5/22/2025	15:30	3.44	5:18	20:50	Potential Work Window
5/22/2025	16:00	2.86	5:18	20:50	Potential Work Window
5/22/2025	16:30	2.71	5:18	20:50	Potential Work Window
5/22/2025	17:00	3.04	5:18	20:50	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/23/2025	5:30	1.92	5:17	20:51	Potential Work Window
5/23/2025	6:00	3.11	5:17	20:51	Potential Work Window
5/23/2025	6:30	4.32	5:17	20:51	Potential Work Window
5/23/2025	7:00	5.25	5:17	20:51	Potential Work Window
5/23/2025	7:30	5.79	5:17	20:51	Potential Work Window
5/23/2025	8:00	5.90	5:17	20:51	Potential Work Window
5/23/2025	8:30	5.57	5:17	20:51	Potential Work Window
5/23/2025	9:00	4.93	5:17	20:51	Potential Work Window
5/23/2025	9:30	4.27	5:17	20:51	Potential Work Window
5/23/2025	10:00	3.94	5:17	20:51	Potential Work Window
5/23/2025	10:30	4.13	5:17	20:51	Potential Work Window
5/23/2025	11:00	4.79	5:17	20:51	Potential Work Window
5/23/2025	11:30	5.86	5:17	20:51	Potential Work Window
5/24/2025	12:00	7.18	5:16	20:52	Potential Work Window
5/24/2025	14:30	6.66	5:16	20:52	Potential Work Window
5/24/2025	15:00	4.78	5:16	20:52	Potential Work Window
5/24/2025	15:30	2.73	5:16	20:52	Potential Work Window
5/24/2025	16:00	0.94	5:16	20:52	Potential Work Window
5/24/2025	16:30	-0.19	5:16	20:52	Potential Work Window
5/24/2025	17:00	-0.54	5:16	20:52	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/25/2025	5:30	-1.85	5:15	20:53	Potential Work Window
5/25/2025	6:00	-0.99	5:15	20:53	Potential Work Window
5/25/2025	6:30	0.72	5:15	20:53	Potential Work Window
5/25/2025	7:00	2.88	5:15	20:53	Potential Work Window
5/25/2025	7:30	4.94	5:15	20:53	Potential Work Window
5/25/2025	8:00	6.56	5:15	20:53	Potential Work Window
5/25/2025	8:30	7.62	5:15	20:53	Potential Work Window
5/25/2025	9:30	7.82	5:15	20:53	Potential Work Window
5/25/2025	10:00	7.21	5:15	20:53	Potential Work Window
5/25/2025	10:30	6.54	5:15	20:53	Potential Work Window
5/25/2025	11:00	6.20	5:15	20:53	Potential Work Window
5/25/2025	11:30	6.29	5:15	20:53	Potential Work Window
5/26/2025	12:00	6.76	5:14	20:55	Potential Work Window
5/26/2025	12:30	7.56	5:14	20:55	Potential Work Window
5/26/2025	14:30	7.94	5:14	20:55	Potential Work Window
5/26/2025	15:00	6.39	5:14	20:55	Potential Work Window
5/26/2025	15:30	4.28	5:14	20:55	Potential Work Window
5/26/2025	16:00	1.86	5:14	20:55	Potential Work Window
5/26/2025	16:30	-0.46	5:14	20:55	Potential Work Window
5/26/2025	17:00	-2.17	5:14	20:55	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/27/2025	5:30	-3.01	5:13	20:56	Potential Work Window
5/27/2025	6:00	-3.48	5:13	20:56	Potential Work Window
5/27/2025	6:30	-2.87	5:13	20:56	Potential Work Window
5/27/2025	7:00	-1.24	5:13	20:56	Potential Work Window
5/27/2025	7:30	1.19	5:13	20:56	Potential Work Window
5/27/2025	8:00	3.87	5:13	20:56	Potential Work Window
5/27/2025	8:30	6.24	5:13	20:56	Potential Work Window
5/27/2025	11:30	7.67	5:13	20:56	Potential Work Window
5/28/2025	12:00	7.27	5:12	20:57	Potential Work Window
5/28/2025	12:30	7.24	5:12	20:57	Potential Work Window
5/28/2025	13:00	7.51	5:12	20:57	Potential Work Window
5/28/2025	15:00	7.88	5:12	20:57	Potential Work Window
5/28/2025	15:30	6.59	5:12	20:57	Potential Work Window
5/28/2025	16:00	4.72	5:12	20:57	Potential Work Window
5/28/2025	16:30	2.44	5:12	20:57	Potential Work Window
5/28/2025	17:00	0.03	5:12	20:57	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/29/2025	5:30	-0.26	5:11	20:58	Potential Work Window
5/29/2025	6:00	-2.09	5:11	20:58	Potential Work Window
5/29/2025	6:30	-3.08	5:11	20:58	Potential Work Window
5/29/2025	7:00	-3.05	5:11	20:58	Potential Work Window
5/29/2025	7:30	-2.02	5:11	20:58	Potential Work Window
5/29/2025	8:00	-0.07	5:11	20:58	Potential Work Window
5/29/2025	8:30	2.48	5:11	20:58	Potential Work Window
5/29/2025	9:00	5.06	5:11	20:58	Potential Work Window
5/29/2025	9:30	7.21	5:11	20:58	Potential Work Window
5/30/2025	12:30	7.61	5:10	20:59	Potential Work Window
5/30/2025	13:00	7.19	5:10	20:59	Potential Work Window
5/30/2025	13:30	7.05	5:10	20:59	Potential Work Window
5/30/2025	14:00	7.18	5:10	20:59	Potential Work Window
5/30/2025	14:30	7.53	5:10	20:59	Potential Work Window
5/30/2025	15:00	7.75	5:10	20:59	Potential Work Window
5/30/2025	15:30	7.54	5:10	20:59	Potential Work Window
5/30/2025	16:00	6.78	5:10	20:59	Potential Work Window
5/30/2025	16:30	5.53	5:10	20:59	Potential Work Window
5/30/2025	17:00	3.82	5:10	20:59	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
5/31/2025	5:30	3.64	5:10	21:00	Potential Work Window
5/31/2025	6:00	1.89	5:10	21:00	Potential Work Window
5/31/2025	6:30	0.16	5:10	21:00	Potential Work Window
5/31/2025	7:00	-1.12	5:10	21:00	Potential Work Window
5/31/2025	7:30	-1.65	5:10	21:00	Potential Work Window
5/31/2025	8:00	-1.34	5:10	21:00	Potential Work Window
5/31/2025	8:30	-0.22	5:10	21:00	Potential Work Window
5/31/2025	9:00	1.64	5:10	21:00	Potential Work Window
5/31/2025	9:30	3.89	5:10	21:00	Potential Work Window
5/31/2025	10:00	6.01	5:10	21:00	Potential Work Window
5/31/2025	10:30	7.69	5:10	21:00	Potential Work Window
6/1/2025	13:00	7.60	5:09	21:01	Potential Work Window
6/1/2025	13:30	6.86	5:09	21:01	Potential Work Window
6/1/2025	14:00	6.34	5:09	21:01	Potential Work Window
6/1/2025	14:30	6.05	5:09	21:01	Potential Work Window
6/1/2025	15:00	6.04	5:09	21:01	Potential Work Window
6/1/2025	15:30	6.26	5:09	21:01	Potential Work Window
6/1/2025	16:00	6.41	5:09	21:01	Potential Work Window
6/1/2025	16:30	6.23	5:09	21:01	Potential Work Window
6/1/2025	17:00	5.71	5:09	21:01	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/2/2025	5:30	5.22	5:08	21:02	Potential Work Window
6/2/2025	6:00	4.63	5:08	21:02	Potential Work Window
6/2/2025	6:30	3.72	5:08	21:02	Potential Work Window
6/2/2025	7:00	2.60	5:08	21:02	Potential Work Window
6/2/2025	7:30	1.50	5:08	21:02	Potential Work Window
6/2/2025	8:00	0.77	5:08	21:02	Potential Work Window
6/2/2025	8:30	0.61	5:08	21:02	Potential Work Window
6/2/2025	9:00	1.02	5:08	21:02	Potential Work Window
6/2/2025	9:30	2.05	5:08	21:02	Potential Work Window
6/2/2025	10:00	3.64	5:08	21:02	Potential Work Window
6/2/2025	10:30	5.42	5:08	21:02	Potential Work Window
6/2/2025	11:00	6.98	5:08	21:02	Potential Work Window
6/3/2025	13:30	7.38	5:08	21:03	Potential Work Window
6/3/2025	14:00	6.31	5:08	21:03	Potential Work Window
6/3/2025	14:30	5.36	5:08	21:03	Potential Work Window
6/3/2025	15:00	4.62	5:08	21:03	Potential Work Window
6/3/2025	15:30	4.16	5:08	21:03	Potential Work Window
6/3/2025	16:00	4.11	5:08	21:03	Potential Work Window
6/3/2025	16:30	4.40	5:08	21:03	Potential Work Window
6/3/2025	17:00	4.72	5:08	21:03	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/4/2025	5:30	4.02	5:07	21:03	Potential Work Window
6/4/2025	6:00	4.49	5:07	21:03	Potential Work Window
6/4/2025	6:30	4.81	5:07	21:03	Potential Work Window
6/4/2025	7:00	4.88	5:07	21:03	Potential Work Window
6/4/2025	7:30	4.62	5:07	21:03	Potential Work Window
6/4/2025	8:00	4.11	5:07	21:03	Potential Work Window
6/4/2025	8:30	3.56	5:07	21:03	Potential Work Window
6/4/2025	9:00	3.24	5:07	21:03	Potential Work Window
6/4/2025	9:30	3.26	5:07	21:03	Potential Work Window
6/4/2025	10:00	3.64	5:07	21:03	Potential Work Window
6/4/2025	10:30	4.48	5:07	21:03	Potential Work Window
6/4/2025	11:00	5.70	5:07	21:03	Potential Work Window
6/4/2025	11:30	6.92	5:07	21:03	Potential Work Window
6/5/2025	12:00	7.86	5:07	21:04	Potential Work Window
6/5/2025	13:30	7.88	5:07	21:04	Potential Work Window
6/5/2025	14:00	6.82	5:07	21:04	Potential Work Window
6/5/2025	14:30	5.44	5:07	21:04	Potential Work Window
6/5/2025	15:00	4.05	5:07	21:04	Potential Work Window
6/5/2025	15:30	2.90	5:07	21:04	Potential Work Window
6/5/2025	16:00	2.08	5:07	21:04	Potential Work Window
6/5/2025	16:30	1.76	5:07	21:04	Potential Work Window
6/5/2025	17:00	2.06	5:07	21:04	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/6/2025	5:30	1.42	5:06	21:05	Potential Work Window
6/6/2025	6:00	2.49	5:06	21:05	Potential Work Window
6/6/2025	6:30	3.67	5:06	21:05	Potential Work Window
6/6/2025	7:00	4.77	5:06	21:05	Potential Work Window
6/6/2025	7:30	5.67	5:06	21:05	Potential Work Window
6/6/2025	8:00	6.21	5:06	21:05	Potential Work Window
6/6/2025	8:30	6.32	5:06	21:05	Potential Work Window
6/6/2025	9:00	6.09	5:06	21:05	Potential Work Window
6/6/2025	9:30	5.77	5:06	21:05	Potential Work Window
6/6/2025	10:00	5.58	5:06	21:05	Potential Work Window
6/6/2025	10:30	5.57	5:06	21:05	Potential Work Window
6/6/2025	11:00	5.81	5:06	21:05	Potential Work Window
6/6/2025	11:30	6.39	5:06	21:05	Potential Work Window
6/7/2025	12:00	7.17	5:06	21:06	Potential Work Window
6/7/2025	12:30	7.78	5:06	21:06	Potential Work Window
6/7/2025	13:30	7.84	5:06	21:06	Potential Work Window
6/7/2025	14:00	7.16	5:06	21:06	Potential Work Window
6/7/2025	14:30	5.96	5:06	21:06	Potential Work Window
6/7/2025	15:00	4.37	5:06	21:06	Potential Work Window
6/7/2025	15:30	2.66	5:06	21:06	Potential Work Window
6/7/2025	16:00	1.21	5:06	21:06	Potential Work Window
6/7/2025	16:30	0.23	5:06	21:06	Potential Work Window
6/7/2025	17:00	-0.17	5:06	21:06	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/8/2025	5:30	-0.75	5:06	21:06	Potential Work Window
6/8/2025	6:00	0.03	5:06	21:06	Potential Work Window
6/8/2025	6:30	1.51	5:06	21:06	Potential Work Window
6/8/2025	7:00	3.26	5:06	21:06	Potential Work Window
6/8/2025	7:30	4.93	5:06	21:06	Potential Work Window
6/8/2025	8:00	6.35	5:06	21:06	Potential Work Window
6/8/2025	8:30	7.38	5:06	21:06	Potential Work Window
6/8/2025	9:00	7.89	5:06	21:06	Potential Work Window
6/8/2025	9:30	7.89	5:06	21:06	Potential Work Window
6/8/2025	10:00	7.55	5:06	21:06	Potential Work Window
6/8/2025	10:30	7.17	5:06	21:06	Potential Work Window
6/8/2025	11:00	6.92	5:06	21:06	Potential Work Window
6/8/2025	11:30	6.81	5:06	21:06	Potential Work Window
6/9/2025	12:00	6.93	5:05	21:07	Potential Work Window
6/9/2025	12:30	7.29	5:05	21:07	Potential Work Window
6/9/2025	13:00	7.64	5:05	21:07	Potential Work Window
6/9/2025	13:30	7.68	5:05	21:07	Potential Work Window
6/9/2025	14:00	7.30	5:05	21:07	Potential Work Window
6/9/2025	14:30	6.48	5:05	21:07	Potential Work Window
6/9/2025	15:00	5.20	5:05	21:07	Potential Work Window
6/9/2025	15:30	3.52	5:05	21:07	Potential Work Window
6/9/2025	16:00	1.68	5:05	21:07	Potential Work Window
6/9/2025	16:30	0.06	5:05	21:07	Potential Work Window
6/9/2025	17:00	-0.99	5:05	21:07	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/10/2025	5:30	-1.59	5:05	21:08	Potential Work Window
6/10/2025	6:00	-1.53	5:05	21:08	Potential Work Window
6/10/2025	6:30	-0.67	5:05	21:08	Potential Work Window
6/10/2025	7:00	0.95	5:05	21:08	Potential Work Window
6/10/2025	7:30	3.03	5:05	21:08	Potential Work Window
6/10/2025	8:00	5.07	5:05	21:08	Potential Work Window
6/10/2025	8:30	6.77	5:05	21:08	Potential Work Window
6/10/2025	11:00	7.89	5:05	21:08	Potential Work Window
6/10/2025	11:30	7.45	5:05	21:08	Potential Work Window
6/11/2025	12:00	7.21	5:05	21:08	Potential Work Window
6/11/2025	12:30	7.12	5:05	21:08	Potential Work Window
6/11/2025	13:00	7.24	5:05	21:08	Potential Work Window
6/11/2025	13:30	7.47	5:05	21:08	Potential Work Window
6/11/2025	14:00	7.50	5:05	21:08	Potential Work Window
6/11/2025	14:30	7.09	5:05	21:08	Potential Work Window
6/11/2025	15:00	6.24	5:05	21:08	Potential Work Window
6/11/2025	15:30	4.96	5:05	21:08	Potential Work Window
6/11/2025	16:00	3.31	5:05	21:08	Potential Work Window
6/11/2025	16:30	1.45	5:05	21:08	Potential Work Window
6/11/2025	17:00	-0.29	5:05	21:08	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/12/2025	5:30	-0.92	5:05	21:09	Potential Work Window
6/12/2025	6:00	-1.85	5:05	21:09	Potential Work Window
6/12/2025	6:30	-1.89	5:05	21:09	Potential Work Window
6/12/2025	7:00	-1.11	5:05	21:09	Potential Work Window
6/12/2025	7:30	0.43	5:05	21:09	Potential Work Window
6/12/2025	8:00	2.56	5:05	21:09	Potential Work Window
6/12/2025	8:30	4.80	5:05	21:09	Potential Work Window
6/12/2025	9:00	6.70	5:05	21:09	Potential Work Window
6/13/2025	12:00	7.54	5:05	21:10	Potential Work Window
6/13/2025	12:30	7.20	5:05	21:10	Potential Work Window
6/13/2025	13:00	7.09	5:05	21:10	Potential Work Window
6/13/2025	13:30	7.14	5:05	21:10	Potential Work Window
6/13/2025	14:00	7.32	5:05	21:10	Potential Work Window
6/13/2025	14:30	7.45	5:05	21:10	Potential Work Window
6/13/2025	15:00	7.20	5:05	21:10	Potential Work Window
6/13/2025	15:30	6.45	5:05	21:10	Potential Work Window
6/13/2025	16:00	5.26	5:05	21:10	Potential Work Window
6/13/2025	16:30	3.69	5:05	21:10	Potential Work Window
6/13/2025	17:00	1.88	5:05	21:10	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/14/2025	5:30	1.35	5:04	21:10	Potential Work Window
6/14/2025	6:00	-0.34	5:04	21:10	Potential Work Window
6/14/2025	6:30	-1.53	5:04	21:10	Potential Work Window
6/14/2025	7:00	-1.86	5:04	21:10	Potential Work Window
6/14/2025	7:30	-1.30	5:04	21:10	Potential Work Window
6/14/2025	8:00	0.02	5:04	21:10	Potential Work Window
6/14/2025	8:30	1.96	5:04	21:10	Potential Work Window
6/14/2025	9:00	4.23	5:04	21:10	Potential Work Window
6/14/2025	9:30	6.30	5:04	21:10	Potential Work Window
6/14/2025	10:00	7.84	5:04	21:10	Potential Work Window
6/15/2025	12:30	7.49	5:04	21:10	Potential Work Window
6/15/2025	13:00	6.94	5:04	21:10	Potential Work Window
6/15/2025	13:30	6.71	5:04	21:10	Potential Work Window
6/15/2025	14:00	6.69	5:04	21:10	Potential Work Window
6/15/2025	14:30	6.81	5:04	21:10	Potential Work Window
6/15/2025	15:00	7.00	5:04	21:10	Potential Work Window
6/15/2025	15:30	7.01	5:04	21:10	Potential Work Window
6/15/2025	16:00	6.56	5:04	21:10	Potential Work Window
6/15/2025	16:30	5.62	5:04	21:10	Potential Work Window
6/15/2025	17:00	4.30	5:04	21:10	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/16/2025	5:30	3.91	5:04	21:11	Potential Work Window
6/16/2025	6:00	2.45	5:04	21:11	Potential Work Window
6/16/2025	6:30	0.95	5:04	21:11	Potential Work Window
6/16/2025	7:00	-0.28	5:04	21:11	Potential Work Window
6/16/2025	7:30	-0.88	5:04	21:11	Potential Work Window
6/16/2025	8:00	-0.63	5:04	21:11	Potential Work Window
6/16/2025	8:30	0.39	5:04	21:11	Potential Work Window
6/16/2025	9:00	2.00	5:04	21:11	Potential Work Window
6/16/2025	9:30	4.02	5:04	21:11	Potential Work Window
6/16/2025	10:00	6.10	5:04	21:11	Potential Work Window
6/16/2025	10:30	7.75	5:04	21:11	Potential Work Window
6/17/2025	13:00	7.21	5:04	21:11	Potential Work Window
6/17/2025	13:30	6.25	5:04	21:11	Potential Work Window
6/17/2025	14:00	5.61	5:04	21:11	Potential Work Window
6/17/2025	14:30	5.31	5:04	21:11	Potential Work Window
6/17/2025	15:00	5.26	5:04	21:11	Potential Work Window
6/17/2025	15:30	5.43	5:04	21:11	Potential Work Window
6/17/2025	16:00	5.70	5:04	21:11	Potential Work Window
6/17/2025	16:30	5.78	5:04	21:11	Potential Work Window
6/17/2025	17:00	5.45	5:04	21:11	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/18/2025	5:30	4.96	5:04	21:12	Potential Work Window
6/18/2025	6:00	4.56	5:04	21:12	Potential Work Window
6/18/2025	6:30	3.89	5:04	21:12	Potential Work Window
6/18/2025	7:00	3.02	5:04	21:12	Potential Work Window
6/18/2025	7:30	2.13	5:04	21:12	Potential Work Window
6/18/2025	8:00	1.50	5:04	21:12	Potential Work Window
6/18/2025	8:30	1.44	5:04	21:12	Potential Work Window
6/18/2025	9:00	2.04	5:04	21:12	Potential Work Window
6/18/2025	9:30	3.18	5:04	21:12	Potential Work Window
6/18/2025	10:00	4.70	5:04	21:12	Potential Work Window
6/18/2025	10:30	6.42	5:04	21:12	Potential Work Window
6/18/2025	11:00	7.95	5:04	21:12	Potential Work Window
6/19/2025	13:00	7.93	5:05	21:12	Potential Work Window
6/19/2025	13:30	6.61	5:05	21:12	Potential Work Window
6/19/2025	14:00	5.12	5:05	21:12	Potential Work Window
6/19/2025	14:30	3.81	5:05	21:12	Potential Work Window
6/19/2025	15:00	2.95	5:05	21:12	Potential Work Window
6/19/2025	15:30	2.56	5:05	21:12	Potential Work Window
6/19/2025	16:00	2.60	5:05	21:12	Potential Work Window
6/19/2025	16:30	3.09	5:05	21:12	Potential Work Window
6/19/2025	17:00	3.82	5:05	21:12	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/20/2025	5:30	3.10	5:05	21:12	Potential Work Window
6/20/2025	6:00	4.13	5:05	21:12	Potential Work Window
6/20/2025	6:30	4.89	5:05	21:12	Potential Work Window
6/20/2025	7:00	5.32	5:05	21:12	Potential Work Window
6/20/2025	7:30	5.41	5:05	21:12	Potential Work Window
6/20/2025	8:00	5.18	5:05	21:12	Potential Work Window
6/20/2025	8:30	4.79	5:05	21:12	Potential Work Window
6/20/2025	9:00	4.52	5:05	21:12	Potential Work Window
6/20/2025	9:30	4.62	5:05	21:12	Potential Work Window
6/20/2025	10:00	5.15	5:05	21:12	Potential Work Window
6/20/2025	10:30	5.99	5:05	21:12	Potential Work Window
6/20/2025	11:00	7.09	5:05	21:12	Potential Work Window
6/21/2025	13:30	7.62	5:05	21:12	Potential Work Window
6/21/2025	14:00	6.02	5:05	21:12	Potential Work Window
6/21/2025	14:30	4.08	5:05	21:12	Potential Work Window
6/21/2025	15:00	2.12	5:05	21:12	Potential Work Window
6/21/2025	15:30	0.55	5:05	21:12	Potential Work Window
6/21/2025	16:00	-0.37	5:05	21:12	Potential Work Window
6/21/2025	16:30	-0.57	5:05	21:12	Potential Work Window
6/21/2025	17:00	-0.05	5:05	21:12	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/22/2025	5:30	-0.87	5:05	21:12	Potential Work Window
6/22/2025	6:00	0.78	5:05	21:12	Potential Work Window
6/22/2025	6:30	2.77	5:05	21:12	Potential Work Window
6/22/2025	7:00	4.63	5:05	21:12	Potential Work Window
6/22/2025	7:30	6.15	5:05	21:12	Potential Work Window
6/22/2025	8:00	7.21	5:05	21:12	Potential Work Window
6/22/2025	8:30	7.73	5:05	21:12	Potential Work Window
6/22/2025	9:00	7.73	5:05	21:12	Potential Work Window
6/22/2025	9:30	7.40	5:05	21:12	Potential Work Window
6/22/2025	10:00	7.05	5:05	21:12	Potential Work Window
6/22/2025	10:30	6.96	5:05	21:12	Potential Work Window
6/22/2025	11:00	7.15	5:05	21:12	Potential Work Window
6/22/2025	11:30	7.58	5:05	21:12	Potential Work Window
6/23/2025	14:00	7.59	5:06	21:13	Potential Work Window
6/23/2025	14:30	5.98	5:06	21:13	Potential Work Window
6/23/2025	15:00	3.90	5:06	21:13	Potential Work Window
6/23/2025	15:30	1.59	5:06	21:13	Potential Work Window
6/23/2025	16:00	-0.57	5:06	21:13	Potential Work Window
6/23/2025	16:30	-2.10	5:06	21:13	Potential Work Window
6/23/2025	17:00	-2.75	5:06	21:13	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/24/2025	5:30	-3.28	5:06	21:13	Potential Work Window
6/24/2025	6:00	-2.71	5:06	21:13	Potential Work Window
6/24/2025	6:30	-1.13	5:06	21:13	Potential Work Window
6/24/2025	7:00	1.21	5:06	21:13	Potential Work Window
6/24/2025	7:30	3.74	5:06	21:13	Potential Work Window
6/24/2025	8:00	6.00	5:06	21:13	Potential Work Window
6/24/2025	8:30	7.76	5:06	21:13	Potential Work Window
6/24/2025	11:00	7.96	5:06	21:13	Potential Work Window
6/24/2025	11:30	7.64	5:06	21:13	Potential Work Window
6/25/2025	12:00	7.58	5:06	21:13	Potential Work Window
6/25/2025	12:30	7.81	5:06	21:13	Potential Work Window
6/25/2025	14:30	7.83	5:06	21:13	Potential Work Window
6/25/2025	15:00	6.55	5:06	21:13	Potential Work Window
6/25/2025	15:30	4.71	5:06	21:13	Potential Work Window
6/25/2025	16:00	2.45	5:06	21:13	Potential Work Window
6/25/2025	16:30	0.08	5:06	21:13	Potential Work Window
6/25/2025	17:00	-1.94	5:06	21:13	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/26/2025	5:30	-2.11	5:07	21:13	Potential Work Window
6/26/2025	6:00	-3.09	5:07	21:13	Potential Work Window
6/26/2025	6:30	-3.06	5:07	21:13	Potential Work Window
6/26/2025	7:00	-2.00	5:07	21:13	Potential Work Window
6/26/2025	7:30	0.02	5:07	21:13	Potential Work Window
6/26/2025	8:00	2.60	5:07	21:13	Potential Work Window
6/26/2025	8:30	5.14	5:07	21:13	Potential Work Window
6/26/2025	9:00	7.25	5:07	21:13	Potential Work Window
6/27/2025	12:00	7.55	5:07	21:12	Potential Work Window
6/27/2025	12:30	7.17	5:07	21:12	Potential Work Window
6/27/2025	13:00	7.08	5:07	21:12	Potential Work Window
6/27/2025	13:30	7.32	5:07	21:12	Potential Work Window
6/27/2025	14:00	7.77	5:07	21:12	Potential Work Window
6/27/2025	15:00	7.82	5:07	21:12	Potential Work Window
6/27/2025	15:30	7.05	5:07	21:12	Potential Work Window
6/27/2025	16:00	5.74	5:07	21:12	Potential Work Window
6/27/2025	16:30	3.91	5:07	21:12	Potential Work Window
6/27/2025	17:00	1.76	5:07	21:12	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/28/2025	5:30	1.62	5:08	21:12	Potential Work Window
6/28/2025	6:00	-0.25	5:08	21:12	Potential Work Window
6/28/2025	6:30	-1.55	5:08	21:12	Potential Work Window
6/28/2025	7:00	-1.98	5:08	21:12	Potential Work Window
6/28/2025	7:30	-1.50	5:08	21:12	Potential Work Window
6/28/2025	8:00	-0.12	5:08	21:12	Potential Work Window
6/28/2025	8:30	2.02	5:08	21:12	Potential Work Window
6/28/2025	9:00	4.42	5:08	21:12	Potential Work Window
6/28/2025	9:30	6.57	5:08	21:12	Potential Work Window
6/29/2025	12:30	7.20	5:08	21:12	Potential Work Window
6/29/2025	13:00	6.50	5:08	21:12	Potential Work Window
6/29/2025	13:30	6.10	5:08	21:12	Potential Work Window
6/29/2025	14:00	6.02	5:08	21:12	Potential Work Window
6/29/2025	14:30	6.29	5:08	21:12	Potential Work Window
6/29/2025	15:00	6.72	5:08	21:12	Potential Work Window
6/29/2025	15:30	6.93	5:08	21:12	Potential Work Window
6/29/2025	16:00	6.71	5:08	21:12	Potential Work Window
6/29/2025	16:30	6.03	5:08	21:12	Potential Work Window
6/29/2025	17:00	4.89	5:08	21:12	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
6/30/2025	5:30	4.54	5:09	21:12	Potential Work Window
6/30/2025	6:00	3.30	5:09	21:12	Potential Work Window
6/30/2025	6:30	1.93	5:09	21:12	Potential Work Window
6/30/2025	7:00	0.78	5:09	21:12	Potential Work Window
6/30/2025	7:30	0.20	5:09	21:12	Potential Work Window
6/30/2025	8:00	0.34	5:09	21:12	Potential Work Window
6/30/2025	8:30	1.14	5:09	21:12	Potential Work Window
6/30/2025	9:00	2.60	5:09	21:12	Potential Work Window
6/30/2025	9:30	4.51	5:09	21:12	Potential Work Window
6/30/2025	10:00	6.39	5:09	21:12	Potential Work Window
6/30/2025	10:30	7.85	5:09	21:12	Potential Work Window
7/1/2025	12:30	7.83	5:09	21:12	Potential Work Window
7/1/2025	13:00	6.70	5:09	21:12	Potential Work Window
7/1/2025	13:30	5.63	5:09	21:12	Potential Work Window
7/1/2025	14:00	4.85	5:09	21:12	Potential Work Window
7/1/2025	14:30	4.39	5:09	21:12	Potential Work Window
7/1/2025	15:00	4.29	5:09	21:12	Potential Work Window
7/1/2025	15:30	4.58	5:09	21:12	Potential Work Window
7/1/2025	16:00	5.04	5:09	21:12	Potential Work Window
7/1/2025	16:30	5.33	5:09	21:12	Potential Work Window
7/1/2025	17:00	5.32	5:09	21:12	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/2/2025	5:30	4.84	5:10	21:11	Potential Work Window
7/2/2025	6:00	4.83	5:10	21:11	Potential Work Window
7/2/2025	6:30	4.55	5:10	21:11	Potential Work Window
7/2/2025	7:00	4.03	5:10	21:11	Potential Work Window
7/2/2025	7:30	3.42	5:10	21:11	Potential Work Window
7/2/2025	8:00	3.02	5:10	21:11	Potential Work Window
7/2/2025	8:30	3.02	5:10	21:11	Potential Work Window
7/2/2025	9:00	3.43	5:10	21:11	Potential Work Window
7/2/2025	9:30	4.21	5:10	21:11	Potential Work Window
7/2/2025	10:00	5.38	5:10	21:11	Potential Work Window
7/2/2025	10:30	6.70	5:10	21:11	Potential Work Window
7/2/2025	11:00	7.79	5:10	21:11	Potential Work Window
7/3/2025	13:00	7.27	5:11	21:11	Potential Work Window
7/3/2025	13:30	6.00	5:11	21:11	Potential Work Window
7/3/2025	14:00	4.62	5:11	21:11	Potential Work Window
7/3/2025	14:30	3.44	5:11	21:11	Potential Work Window
7/3/2025	15:00	2.62	5:11	21:11	Potential Work Window
7/3/2025	15:30	2.17	5:11	21:11	Potential Work Window
7/3/2025	16:00	2.21	5:11	21:11	Potential Work Window
7/3/2025	16:30	2.74	5:11	21:11	Potential Work Window
7/3/2025	17:00	3.48	5:11	21:11	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/4/2025	5:30	3.13	5:11	21:11	Potential Work Window
7/4/2025	6:00	4.08	5:11	21:11	Potential Work Window
7/4/2025	6:30	4.91	5:11	21:11	Potential Work Window
7/4/2025	7:00	5.53	5:11	21:11	Potential Work Window
7/4/2025	7:30	5.86	5:11	21:11	Potential Work Window
7/4/2025	8:00	5.88	5:11	21:11	Potential Work Window
7/4/2025	8:30	5.75	5:11	21:11	Potential Work Window
7/4/2025	9:00	5.67	5:11	21:11	Potential Work Window
7/4/2025	9:30	5.77	5:11	21:11	Potential Work Window
7/4/2025	10:00	6.01	5:11	21:11	Potential Work Window
7/4/2025	10:30	6.42	5:11	21:11	Potential Work Window
7/4/2025	11:00	7.06	5:11	21:11	Potential Work Window
7/4/2025	11:30	7.69	5:11	21:11	Potential Work Window
7/5/2025	12:30	7.95	5:12	21:10	Potential Work Window
7/5/2025	13:00	7.47	5:12	21:10	Potential Work Window
7/5/2025	13:30	6.57	5:12	21:10	Potential Work Window
7/5/2025	14:00	5.26	5:12	21:10	Potential Work Window
7/5/2025	14:30	3.72	5:12	21:10	Potential Work Window
7/5/2025	15:00	2.24	5:12	21:10	Potential Work Window
7/5/2025	15:30	1.11	5:12	21:10	Potential Work Window
7/5/2025	16:00	0.44	5:12	21:10	Potential Work Window
7/5/2025	16:30	0.30	5:12	21:10	Potential Work Window
7/5/2025	17:00	0.81	5:12	21:10	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/6/2025	5:30	0.62	5:13	21:10	Potential Work Window
7/6/2025	6:00	2.01	5:13	21:10	Potential Work Window
7/6/2025	6:30	3.55	5:13	21:10	Potential Work Window
7/6/2025	7:00	5.01	5:13	21:10	Potential Work Window
7/6/2025	7:30	6.26	5:13	21:10	Potential Work Window
7/6/2025	8:00	7.17	5:13	21:10	Potential Work Window
7/6/2025	8:30	7.64	5:13	21:10	Potential Work Window
7/6/2025	9:00	7.70	5:13	21:10	Potential Work Window
7/6/2025	9:30	7.51	5:13	21:10	Potential Work Window
7/6/2025	10:00	7.32	5:13	21:10	Potential Work Window
7/6/2025	10:30	7.18	5:13	21:10	Potential Work Window
7/6/2025	11:00	7.11	5:13	21:10	Potential Work Window
7/6/2025	11:30	7.20	5:13	21:10	Potential Work Window
7/7/2025	12:00	7.46	5:14	21:09	Potential Work Window
7/7/2025	12:30	7.63	5:14	21:09	Potential Work Window
7/7/2025	13:00	7.49	5:14	21:09	Potential Work Window
7/7/2025	13:30	7.00	5:14	21:09	Potential Work Window
7/7/2025	14:00	6.14	5:14	21:09	Potential Work Window
7/7/2025	14:30	4.88	5:14	21:09	Potential Work Window
7/7/2025	15:00	3.31	5:14	21:09	Potential Work Window
7/7/2025	15:30	1.64	5:14	21:09	Potential Work Window
7/7/2025	16:00	0.23	5:14	21:09	Potential Work Window
7/7/2025	16:30	-0.64	5:14	21:09	Potential Work Window
7/7/2025	17:00	-0.90	5:14	21:09	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/8/2025	5:30	-1.19	5:15	21:09	Potential Work Window
7/8/2025	6:00	-0.39	5:15	21:09	Potential Work Window
7/8/2025	6:30	1.15	5:15	21:09	Potential Work Window
7/8/2025	7:00	3.08	5:15	21:09	Potential Work Window
7/8/2025	7:30	4.96	5:15	21:09	Potential Work Window
7/8/2025	8:00	6.57	5:15	21:09	Potential Work Window
7/8/2025	8:30	7.79	5:15	21:09	Potential Work Window
7/8/2025	10:30	7.93	5:15	21:09	Potential Work Window
7/8/2025	11:00	7.57	5:15	21:09	Potential Work Window
7/8/2025	11:30	7.32	5:15	21:09	Potential Work Window
7/9/2025	12:00	7.20	5:16	21:08	Potential Work Window
7/9/2025	12:30	7.30	5:16	21:08	Potential Work Window
7/9/2025	13:00	7.50	5:16	21:08	Potential Work Window
7/9/2025	13:30	7.48	5:16	21:08	Potential Work Window
7/9/2025	14:00	7.09	5:16	21:08	Potential Work Window
7/9/2025	14:30	6.30	5:16	21:08	Potential Work Window
7/9/2025	15:00	5.09	5:16	21:08	Potential Work Window
7/9/2025	15:30	3.50	5:16	21:08	Potential Work Window
7/9/2025	16:00	1.68	5:16	21:08	Potential Work Window
7/9/2025	16:30	-0.02	5:16	21:08	Potential Work Window
7/9/2025	17:00	-1.20	5:16	21:08	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/10/2025	5:30	-1.70	5:16	21:07	Potential Work Window
7/10/2025	6:00	-1.84	5:16	21:07	Potential Work Window
7/10/2025	6:30	-1.15	5:16	21:07	Potential Work Window
7/10/2025	7:00	0.35	5:16	21:07	Potential Work Window
7/10/2025	7:30	2.44	5:16	21:07	Potential Work Window
7/10/2025	8:00	4.63	5:16	21:07	Potential Work Window
7/10/2025	8:30	6.50	5:16	21:07	Potential Work Window
7/10/2025	9:00	7.90	5:16	21:07	Potential Work Window
7/10/2025	11:30	7.48	5:16	21:07	Potential Work Window
7/11/2025	12:00	7.17	5:17	21:07	Potential Work Window
7/11/2025	12:30	7.07	5:17	21:07	Potential Work Window
7/11/2025	13:00	7.17	5:17	21:07	Potential Work Window
7/11/2025	13:30	7.47	5:17	21:07	Potential Work Window
7/11/2025	14:00	7.69	5:17	21:07	Potential Work Window
7/11/2025	14:30	7.52	5:17	21:07	Potential Work Window
7/11/2025	15:00	6.84	5:17	21:07	Potential Work Window
7/11/2025	15:30	5.69	5:17	21:07	Potential Work Window
7/11/2025	16:00	4.09	5:17	21:07	Potential Work Window
7/11/2025	16:30	2.18	5:17	21:07	Potential Work Window
7/11/2025	17:00	0.24	5:17	21:07	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/12/2025	5:30	-0.32	5:18	21:06	Potential Work Window
7/12/2025	6:00	-1.62	5:18	21:06	Potential Work Window
7/12/2025	6:30	-2.01	5:18	21:06	Potential Work Window
7/12/2025	7:00	-1.47	5:18	21:06	Potential Work Window
7/12/2025	7:30	-0.09	5:18	21:06	Potential Work Window
7/12/2025	8:00	1.96	5:18	21:06	Potential Work Window
7/12/2025	8:30	4.31	5:18	21:06	Potential Work Window
7/12/2025	9:00	6.40	5:18	21:06	Potential Work Window
7/12/2025	9:30	7.93	5:18	21:06	Potential Work Window
7/12/2025	11:30	7.93	5:18	21:06	Potential Work Window
7/13/2025	12:00	7.12	5:19	21:05	Potential Work Window
7/13/2025	12:30	6.59	5:19	21:05	Potential Work Window
7/13/2025	13:00	6.42	5:19	21:05	Potential Work Window
7/13/2025	13:30	6.53	5:19	21:05	Potential Work Window
7/13/2025	14:00	6.87	5:19	21:05	Potential Work Window
7/13/2025	14:30	7.30	5:19	21:05	Potential Work Window
7/13/2025	15:00	7.46	5:19	21:05	Potential Work Window
7/13/2025	15:30	7.09	5:19	21:05	Potential Work Window
7/13/2025	16:00	6.17	5:19	21:05	Potential Work Window
7/13/2025	16:30	4.76	5:19	21:05	Potential Work Window
7/13/2025	17:00	2.98	5:19	21:05	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/14/2025	5:30	2.62	5:20	21:04	Potential Work Window
7/14/2025	6:00	0.92	5:20	21:04	Potential Work Window
7/14/2025	6:30	-0.44	5:20	21:04	Potential Work Window
7/14/2025	7:00	-1.03	5:20	21:04	Potential Work Window
7/14/2025	7:30	-0.67	5:20	21:04	Potential Work Window
7/14/2025	8:00	0.51	5:20	21:04	Potential Work Window
7/14/2025	8:30	2.33	5:20	21:04	Potential Work Window
7/14/2025	9:00	4.54	5:20	21:04	Potential Work Window
7/14/2025	9:30	6.65	5:20	21:04	Potential Work Window
7/15/2025	12:00	7.63	5:21	21:03	Potential Work Window
7/15/2025	12:30	6.45	5:21	21:03	Potential Work Window
7/15/2025	13:00	5.46	5:21	21:03	Potential Work Window
7/15/2025	13:30	4.92	5:21	21:03	Potential Work Window
7/15/2025	14:00	4.83	5:21	21:03	Potential Work Window
7/15/2025	14:30	5.07	5:21	21:03	Potential Work Window
7/15/2025	15:00	5.59	5:21	21:03	Potential Work Window
7/15/2025	15:30	6.13	5:21	21:03	Potential Work Window
7/15/2025	16:00	6.33	5:21	21:03	Potential Work Window
7/15/2025	16:30	6.00	5:21	21:03	Potential Work Window
7/15/2025	17:00	5.20	5:21	21:03	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/16/2025	5:30	4.95	5:23	21:03	Potential Work Window
7/16/2025	6:00	4.08	5:23	21:03	Potential Work Window
7/16/2025	6:30	3.03	5:23	21:03	Potential Work Window
7/16/2025	7:00	2.05	5:23	21:03	Potential Work Window
7/16/2025	7:30	1.47	5:23	21:03	Potential Work Window
7/16/2025	8:00	1.60	5:23	21:03	Potential Work Window
7/16/2025	8:30	2.44	5:23	21:03	Potential Work Window
7/16/2025	9:00	3.79	5:23	21:03	Potential Work Window
7/16/2025	9:30	5.47	5:23	21:03	Potential Work Window
7/16/2025	10:00	7.23	5:23	21:03	Potential Work Window
7/17/2025	12:30	7.15	5:24	21:02	Potential Work Window
7/17/2025	13:00	5.61	5:24	21:02	Potential Work Window
7/17/2025	13:30	4.07	5:24	21:02	Potential Work Window
7/17/2025	14:00	2.92	5:24	21:02	Potential Work Window
7/17/2025	14:30	2.35	5:24	21:02	Potential Work Window
7/17/2025	15:00	2.30	5:24	21:02	Potential Work Window
7/17/2025	15:30	2.72	5:24	21:02	Potential Work Window
7/17/2025	16:00	3.52	5:24	21:02	Potential Work Window
7/17/2025	16:30	4.40	5:24	21:02	Potential Work Window
7/17/2025	17:00	4.99	5:24	21:02	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/18/2025	5:30	4.62	5:25	21:01	Potential Work Window
7/18/2025	6:00	5.21	5:25	21:01	Potential Work Window
7/18/2025	6:30	5.46	5:25	21:01	Potential Work Window
7/18/2025	7:00	5.40	5:25	21:01	Potential Work Window
7/18/2025	7:30	5.11	5:25	21:01	Potential Work Window
7/18/2025	8:00	4.78	5:25	21:01	Potential Work Window
7/18/2025	8:30	4.69	5:25	21:01	Potential Work Window
7/18/2025	9:00	5.04	5:25	21:01	Potential Work Window
7/18/2025	9:30	5.74	5:25	21:01	Potential Work Window
7/18/2025	10:00	6.67	5:25	21:01	Potential Work Window
7/18/2025	10:30	7.74	5:25	21:01	Potential Work Window
7/19/2025	13:00	6.84	5:26	21:00	Potential Work Window
7/19/2025	13:30	5.14	5:26	21:00	Potential Work Window
7/19/2025	14:00	3.25	5:26	21:00	Potential Work Window
7/19/2025	14:30	1.50	5:26	21:00	Potential Work Window
7/19/2025	15:00	0.27	5:26	21:00	Potential Work Window
7/19/2025	15:30	-0.30	5:26	21:00	Potential Work Window
7/19/2025	16:00	-0.22	5:26	21:00	Potential Work Window
7/19/2025	16:30	0.52	5:26	21:00	Potential Work Window
7/19/2025	17:00	1.82	5:26	21:00	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/20/2025	5:30	1.41	5:27	20:59	Potential Work Window
7/20/2025	6:00	3.18	5:27	20:59	Potential Work Window
7/20/2025	6:30	4.79	5:27	20:59	Potential Work Window
7/20/2025	7:00	6.11	5:27	20:59	Potential Work Window
7/20/2025	7:30	7.03	5:27	20:59	Potential Work Window
7/20/2025	8:00	7.49	5:27	20:59	Potential Work Window
7/20/2025	8:30	7.54	5:27	20:59	Potential Work Window
7/20/2025	9:00	7.35	5:27	20:59	Potential Work Window
7/20/2025	9:30	7.20	5:27	20:59	Potential Work Window
7/20/2025	10:00	7.25	5:27	20:59	Potential Work Window
7/20/2025	10:30	7.46	5:27	20:59	Potential Work Window
7/20/2025	11:00	7.83	5:27	20:59	Potential Work Window
7/21/2025	13:30	7.05	5:28	20:57	Potential Work Window
7/21/2025	14:00	5.52	5:28	20:57	Potential Work Window
7/21/2025	14:30	3.60	5:28	20:57	Potential Work Window
7/21/2025	15:00	1.53	5:28	20:57	Potential Work Window
7/21/2025	15:30	-0.32	5:28	20:57	Potential Work Window
7/21/2025	16:00	-1.58	5:28	20:57	Potential Work Window
7/21/2025	16:30	-2.07	5:28	20:57	Potential Work Window
7/21/2025	17:00	-1.74	5:28	20:57	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/22/2025	5:30	-1.99	5:29	20:56	Potential Work Window
7/22/2025	6:00	-0.54	5:29	20:56	Potential Work Window
7/22/2025	6:30	1.56	5:29	20:56	Potential Work Window
7/22/2025	7:00	3.80	5:29	20:56	Potential Work Window
7/22/2025	7:30	5.82	5:29	20:56	Potential Work Window
7/22/2025	8:00	7.44	5:29	20:56	Potential Work Window
7/22/2025	10:30	7.85	5:29	20:56	Potential Work Window
7/22/2025	11:00	7.55	5:29	20:56	Potential Work Window
7/22/2025	11:30	7.45	5:29	20:56	Potential Work Window
7/23/2025	12:00	7.64	5:31	20:55	Potential Work Window
7/23/2025	14:00	7.62	5:31	20:55	Potential Work Window
7/23/2025	14:30	6.51	5:31	20:55	Potential Work Window
7/23/2025	15:00	4.87	5:31	20:55	Potential Work Window
7/23/2025	15:30	2.81	5:31	20:55	Potential Work Window
7/23/2025	16:00	0.62	5:31	20:55	Potential Work Window
7/23/2025	16:30	-1.24	5:31	20:55	Potential Work Window
7/23/2025	17:00	-2.38	5:31	20:55	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/24/2025	6:00	-2.48	5:32	20:54	Potential Work Window
7/24/2025	6:30	-1.51	5:32	20:54	Potential Work Window
7/24/2025	7:00	0.39	5:32	20:54	Potential Work Window
7/24/2025	7:30	2.79	5:32	20:54	Potential Work Window
7/24/2025	8:00	5.12	5:32	20:54	Potential Work Window
7/24/2025	8:30	7.08	5:32	20:54	Potential Work Window
7/24/2025	11:00	7.78	5:32	20:54	Potential Work Window
7/24/2025	11:30	7.13	5:32	20:54	Potential Work Window
7/25/2025	12:00	6.76	5:33	20:53	Potential Work Window
7/25/2025	12:30	6.71	5:33	20:53	Potential Work Window
7/25/2025	13:00	7.06	5:33	20:53	Potential Work Window
7/25/2025	13:30	7.63	5:33	20:53	Potential Work Window
7/25/2025	14:00	7.99	5:33	20:53	Potential Work Window
7/25/2025	14:30	7.91	5:33	20:53	Potential Work Window
7/25/2025	15:00	7.29	5:33	20:53	Potential Work Window
7/25/2025	15:30	6.10	5:33	20:53	Potential Work Window
7/25/2025	16:00	4.34	5:33	20:53	Potential Work Window
7/25/2025	16:30	2.22	5:33	20:53	Potential Work Window
7/25/2025	17:00	0.12	5:33	20:53	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/26/2025	6:00	-1.24	5:34	20:51	Potential Work Window
7/26/2025	6:30	-1.65	5:34	20:51	Potential Work Window
7/26/2025	7:00	-1.14	5:34	20:51	Potential Work Window
7/26/2025	7:30	0.31	5:34	20:51	Potential Work Window
7/26/2025	8:00	2.47	5:34	20:51	Potential Work Window
7/26/2025	8:30	4.80	5:34	20:51	Potential Work Window
7/26/2025	9:00	6.80	5:34	20:51	Potential Work Window
7/26/2025	11:30	7.41	5:34	20:51	Potential Work Window
7/27/2025	12:00	6.45	5:36	20:50	Potential Work Window
7/27/2025	12:30	5.81	5:36	20:50	Potential Work Window
7/27/2025	13:00	5.55	5:36	20:50	Potential Work Window
7/27/2025	13:30	5.70	5:36	20:50	Potential Work Window
7/27/2025	14:00	6.26	5:36	20:50	Potential Work Window
7/27/2025	14:30	6.92	5:36	20:50	Potential Work Window
7/27/2025	15:00	7.28	5:36	20:50	Potential Work Window
7/27/2025	15:30	7.15	5:36	20:50	Potential Work Window
7/27/2025	16:00	6.49	5:36	20:50	Potential Work Window
7/27/2025	16:30	5.29	5:36	20:50	Potential Work Window
7/27/2025	17:00	3.63	5:36	20:50	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/28/2025	6:00	1.91	5:37	20:49	Potential Work Window
7/28/2025	6:30	0.74	5:37	20:49	Potential Work Window
7/28/2025	7:00	0.26	5:37	20:49	Potential Work Window
7/28/2025	7:30	0.55	5:37	20:49	Potential Work Window
7/28/2025	8:00	1.56	5:37	20:49	Potential Work Window
7/28/2025	8:30	3.22	5:37	20:49	Potential Work Window
7/28/2025	9:00	5.20	5:37	20:49	Potential Work Window
7/28/2025	9:30	6.96	5:37	20:49	Potential Work Window
7/28/2025	11:30	8.00	5:37	20:49	Potential Work Window
7/29/2025	12:00	6.86	5:38	20:47	Potential Work Window
7/29/2025	12:30	5.62	5:38	20:47	Potential Work Window
7/29/2025	13:00	4.64	5:38	20:47	Potential Work Window
7/29/2025	13:30	4.11	5:38	20:47	Potential Work Window
7/29/2025	14:00	4.00	5:38	20:47	Potential Work Window
7/29/2025	14:30	4.34	5:38	20:47	Potential Work Window
7/29/2025	15:00	5.04	5:38	20:47	Potential Work Window
7/29/2025	15:30	5.73	5:38	20:47	Potential Work Window
7/29/2025	16:00	6.08	5:38	20:47	Potential Work Window
7/29/2025	16:30	6.02	5:38	20:47	Potential Work Window
7/29/2025	17:00	5.53	5:38	20:47	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
7/30/2025	6:00	4.71	5:39	20:46	Potential Work Window
7/30/2025	6:30	3.92	5:39	20:46	Potential Work Window
7/30/2025	7:00	3.19	5:39	20:46	Potential Work Window
7/30/2025	7:30	2.84	5:39	20:46	Potential Work Window
7/30/2025	8:00	3.03	5:39	20:46	Potential Work Window
7/30/2025	8:30	3.66	5:39	20:46	Potential Work Window
7/30/2025	9:00	4.68	5:39	20:46	Potential Work Window
7/30/2025	9:30	6.00	5:39	20:46	Potential Work Window
7/30/2025	10:00	7.28	5:39	20:46	Potential Work Window
7/31/2025	12:00	7.34	5:41	20:45	Potential Work Window
7/31/2025	12:30	6.14	5:41	20:45	Potential Work Window
7/31/2025	13:00	4.75	5:41	20:45	Potential Work Window
7/31/2025	13:30	3.50	5:41	20:45	Potential Work Window
7/31/2025	14:00	2.68	5:41	20:45	Potential Work Window
7/31/2025	14:30	2.32	5:41	20:45	Potential Work Window
7/31/2025	15:00	2.39	5:41	20:45	Potential Work Window
7/31/2025	15:30	2.94	5:41	20:45	Potential Work Window
7/31/2025	16:00	3.80	5:41	20:45	Potential Work Window
7/31/2025	16:30	4.61	5:41	20:45	Potential Work Window
7/31/2025	17:00	5.17	5:41	20:45	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/1/2025	6:00	5.55	5:42	20:43	Potential Work Window
8/1/2025	6:30	5.79	5:42	20:43	Potential Work Window
8/1/2025	7:00	5.77	5:42	20:43	Potential Work Window
8/1/2025	7:30	5.57	5:42	20:43	Potential Work Window
8/1/2025	8:00	5.40	5:42	20:43	Potential Work Window
8/1/2025	8:30	5.45	5:42	20:43	Potential Work Window
8/1/2025	9:00	5.72	5:42	20:43	Potential Work Window
8/1/2025	9:30	6.13	5:42	20:43	Potential Work Window
8/1/2025	10:00	6.68	5:42	20:43	Potential Work Window
8/1/2025	10:30	7.31	5:42	20:43	Potential Work Window
8/1/2025	11:00	7.75	5:42	20:43	Potential Work Window
8/1/2025	11:30	7.77	5:42	20:43	Potential Work Window
8/2/2025	12:00	7.38	5:43	20:42	Potential Work Window
8/2/2025	12:30	6.62	5:43	20:42	Potential Work Window
8/2/2025	13:00	5.53	5:43	20:42	Potential Work Window
8/2/2025	13:30	4.20	5:43	20:42	Potential Work Window
8/2/2025	14:00	2.84	5:43	20:42	Potential Work Window
8/2/2025	14:30	1.75	5:43	20:42	Potential Work Window
8/2/2025	15:00	1.11	5:43	20:42	Potential Work Window
8/2/2025	15:30	0.93	5:43	20:42	Potential Work Window
8/2/2025	16:00	1.23	5:43	20:42	Potential Work Window
8/2/2025	16:30	2.06	5:43	20:42	Potential Work Window
8/2/2025	17:00	3.18	5:43	20:42	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/3/2025	6:00	4.45	5:45	20:40	Potential Work Window
8/3/2025	6:30	5.56	5:45	20:40	Potential Work Window
8/3/2025	7:00	6.46	5:45	20:40	Potential Work Window
8/3/2025	7:30	7.05	5:45	20:40	Potential Work Window
8/3/2025	8:00	7.29	5:45	20:40	Potential Work Window
8/3/2025	8:30	7.26	5:45	20:40	Potential Work Window
8/3/2025	9:00	7.13	5:45	20:40	Potential Work Window
8/3/2025	9:30	7.06	5:45	20:40	Potential Work Window
8/3/2025	10:00	7.01	5:45	20:40	Potential Work Window
8/3/2025	10:30	6.99	5:45	20:40	Potential Work Window
8/3/2025	11:00	7.09	5:45	20:40	Potential Work Window
8/3/2025	11:30	7.26	5:45	20:40	Potential Work Window
8/4/2025	12:00	7.25	5:46	20:39	Potential Work Window
8/4/2025	12:30	6.93	5:46	20:39	Potential Work Window
8/4/2025	13:00	6.34	5:46	20:39	Potential Work Window
8/4/2025	13:30	5.46	5:46	20:39	Potential Work Window
8/4/2025	14:00	4.28	5:46	20:39	Potential Work Window
8/4/2025	14:30	2.91	5:46	20:39	Potential Work Window
8/4/2025	15:00	1.56	5:46	20:39	Potential Work Window
8/4/2025	15:30	0.55	5:46	20:39	Potential Work Window
8/4/2025	16:00	0.03	5:46	20:39	Potential Work Window
8/4/2025	16:30	0.04	5:46	20:39	Potential Work Window
8/4/2025	17:00	0.65	5:46	20:39	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/5/2025	6:00	1.98	5:47	20:37	Potential Work Window
8/5/2025	6:30	3.66	5:47	20:37	Potential Work Window
8/5/2025	7:00	5.24	5:47	20:37	Potential Work Window
8/5/2025	7:30	6.59	5:47	20:37	Potential Work Window
8/5/2025	8:00	7.59	5:47	20:37	Potential Work Window
8/5/2025	9:30	7.94	5:47	20:37	Potential Work Window
8/5/2025	10:00	7.58	5:47	20:37	Potential Work Window
8/5/2025	10:30	7.27	5:47	20:37	Potential Work Window
8/5/2025	11:00	7.02	5:47	20:37	Potential Work Window
8/5/2025	11:30	6.91	5:47	20:37	Potential Work Window
8/6/2025	12:00	7.02	5:49	20:36	Potential Work Window
8/6/2025	12:30	7.18	5:49	20:36	Potential Work Window
8/6/2025	13:00	7.13	5:49	20:36	Potential Work Window
8/6/2025	13:30	6.77	5:49	20:36	Potential Work Window
8/6/2025	14:00	6.07	5:49	20:36	Potential Work Window
8/6/2025	14:30	4.99	5:49	20:36	Potential Work Window
8/6/2025	15:00	3.56	5:49	20:36	Potential Work Window
8/6/2025	15:30	1.92	5:49	20:36	Potential Work Window
8/6/2025	16:00	0.43	5:49	20:36	Potential Work Window
8/6/2025	16:30	-0.56	5:49	20:36	Potential Work Window
8/6/2025	17:00	-0.90	5:49	20:36	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/7/2025	6:00	-0.61	5:50	20:34	Potential Work Window
8/7/2025	6:30	0.83	5:50	20:34	Potential Work Window
8/7/2025	7:00	2.79	5:50	20:34	Potential Work Window
8/7/2025	7:30	4.77	5:50	20:34	Potential Work Window
8/7/2025	8:00	6.46	5:50	20:34	Potential Work Window
8/7/2025	8:30	7.72	5:50	20:34	Potential Work Window
8/7/2025	10:30	7.56	5:50	20:34	Potential Work Window
8/7/2025	11:00	7.03	5:50	20:34	Potential Work Window
8/7/2025	11:30	6.73	5:50	20:34	Potential Work Window
8/8/2025	12:00	6.65	5:51	20:32	Potential Work Window
8/8/2025	12:30	6.84	5:51	20:32	Potential Work Window
8/8/2025	13:00	7.26	5:51	20:32	Potential Work Window
8/8/2025	13:30	7.58	5:51	20:32	Potential Work Window
8/8/2025	14:00	7.51	5:51	20:32	Potential Work Window
8/8/2025	14:30	6.98	5:51	20:32	Potential Work Window
8/8/2025	15:00	5.96	5:51	20:32	Potential Work Window
8/8/2025	15:30	4.44	5:51	20:32	Potential Work Window
8/8/2025	16:00	2.58	5:51	20:32	Potential Work Window
8/8/2025	16:30	0.68	5:51	20:32	Potential Work Window
8/8/2025	17:00	-0.80	5:51	20:32	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/9/2025	6:00	-1.57	5:53	20:31	Potential Work Window
8/9/2025	6:30	-1.05	5:53	20:31	Potential Work Window
8/9/2025	7:00	0.31	5:53	20:31	Potential Work Window
8/9/2025	7:30	2.36	5:53	20:31	Potential Work Window
8/9/2025	8:00	4.61	5:53	20:31	Potential Work Window
8/9/2025	8:30	6.54	5:53	20:31	Potential Work Window
8/9/2025	9:00	7.91	5:53	20:31	Potential Work Window
8/9/2025	11:00	7.19	5:53	20:31	Potential Work Window
8/9/2025	11:30	6.31	5:53	20:31	Potential Work Window
8/10/2025	12:00	5.80	5:54	20:29	Potential Work Window
8/10/2025	12:30	5.71	5:54	20:29	Potential Work Window
8/10/2025	13:00	5.98	5:54	20:29	Potential Work Window
8/10/2025	13:30	6.59	5:54	20:29	Potential Work Window
8/10/2025	14:00	7.29	5:54	20:29	Potential Work Window
8/10/2025	14:30	7.67	5:54	20:29	Potential Work Window
8/10/2025	15:00	7.48	5:54	20:29	Potential Work Window
8/10/2025	15:30	6.69	5:54	20:29	Potential Work Window
8/10/2025	16:00	5.33	5:54	20:29	Potential Work Window
8/10/2025	16:30	3.52	5:54	20:29	Potential Work Window
8/10/2025	17:00	1.55	5:54	20:29	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/11/2025	6:00	0.01	5:56	20:27	Potential Work Window
8/11/2025	6:30	-0.56	5:56	20:27	Potential Work Window
8/11/2025	7:00	-0.17	5:56	20:27	Potential Work Window
8/11/2025	7:30	1.05	5:56	20:27	Potential Work Window
8/11/2025	8:00	2.91	5:56	20:27	Potential Work Window
8/11/2025	8:30	5.10	5:56	20:27	Potential Work Window
8/11/2025	9:00	7.05	5:56	20:27	Potential Work Window
8/11/2025	11:00	7.80	5:56	20:27	Potential Work Window
8/11/2025	11:30	6.51	5:56	20:27	Potential Work Window
8/12/2025	12:00	5.16	5:57	20:25	Potential Work Window
8/12/2025	12:30	4.17	5:57	20:25	Potential Work Window
8/12/2025	13:00	3.80	5:57	20:25	Potential Work Window
8/12/2025	13:30	3.98	5:57	20:25	Potential Work Window
8/12/2025	14:00	4.62	5:57	20:25	Potential Work Window
8/12/2025	14:30	5.58	5:57	20:25	Potential Work Window
8/12/2025	15:00	6.51	5:57	20:25	Potential Work Window
8/12/2025	15:30	6.96	5:57	20:25	Potential Work Window
8/12/2025	16:00	6.78	5:57	20:25	Potential Work Window
8/12/2025	16:30	6.03	5:57	20:25	Potential Work Window
8/12/2025	17:00	4.78	5:57	20:25	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/13/2025	6:00	3.65	5:58	20:24	Potential Work Window
8/13/2025	6:30	2.54	5:58	20:24	Potential Work Window
8/13/2025	7:00	1.94	5:58	20:24	Potential Work Window
8/13/2025	7:30	2.12	5:58	20:24	Potential Work Window
8/13/2025	8:00	3.00	5:58	20:24	Potential Work Window
8/13/2025	8:30	4.39	5:58	20:24	Potential Work Window
8/13/2025	9:00	6.08	5:58	20:24	Potential Work Window
8/13/2025	9:30	7.69	5:58	20:24	Potential Work Window
8/13/2025	11:30	7.40	5:58	20:24	Potential Work Window
8/14/2025	12:00	5.83	6:00	20:22	Potential Work Window
8/14/2025	12:30	4.08	6:00	20:22	Potential Work Window
8/14/2025	13:00	2.56	6:00	20:22	Potential Work Window
8/14/2025	13:30	1.64	6:00	20:22	Potential Work Window
8/14/2025	14:00	1.45	6:00	20:22	Potential Work Window
8/14/2025	14:30	1.88	6:00	20:22	Potential Work Window
8/14/2025	15:00	2.83	6:00	20:22	Potential Work Window
8/14/2025	15:30	4.11	6:00	20:22	Potential Work Window
8/14/2025	16:00	5.28	6:00	20:22	Potential Work Window
8/14/2025	16:30	6.00	6:00	20:22	Potential Work Window
8/14/2025	17:00	6.20	6:00	20:22	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/15/2025	6:30	5.95	6:01	20:20	Potential Work Window
8/15/2025	7:00	5.46	6:01	20:20	Potential Work Window
8/15/2025	7:30	5.04	6:01	20:20	Potential Work Window
8/15/2025	8:00	4.96	6:01	20:20	Potential Work Window
8/15/2025	8:30	5.36	6:01	20:20	Potential Work Window
8/15/2025	9:00	6.08	6:01	20:20	Potential Work Window
8/15/2025	9:30	6.99	6:01	20:20	Potential Work Window
8/15/2025	10:00	7.96	6:01	20:20	Potential Work Window
8/16/2025	12:00	7.16	6:02	20:18	Potential Work Window
8/16/2025	12:30	5.64	6:02	20:18	Potential Work Window
8/16/2025	13:00	3.85	6:02	20:18	Potential Work Window
8/16/2025	13:30	2.05	6:02	20:18	Potential Work Window
8/16/2025	14:00	0.59	6:02	20:18	Potential Work Window
8/16/2025	14:30	-0.22	6:02	20:18	Potential Work Window
8/16/2025	15:00	-0.33	6:02	20:18	Potential Work Window
8/16/2025	15:30	0.21	6:02	20:18	Potential Work Window
8/16/2025	16:00	1.35	6:02	20:18	Potential Work Window
8/16/2025	16:30	2.88	6:02	20:18	Potential Work Window
8/16/2025	17:00	4.36	6:02	20:18	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/17/2025	6:30	6.60	6:04	20:17	Potential Work Window
8/17/2025	7:00	7.28	6:04	20:17	Potential Work Window
8/17/2025	7:30	7.53	6:04	20:17	Potential Work Window
8/17/2025	8:00	7.45	6:04	20:17	Potential Work Window
8/17/2025	8:30	7.23	6:04	20:17	Potential Work Window
8/17/2025	9:00	7.12	6:04	20:17	Potential Work Window
8/17/2025	9:30	7.19	6:04	20:17	Potential Work Window
8/17/2025	10:00	7.36	6:04	20:17	Potential Work Window
8/17/2025	10:30	7.66	6:04	20:17	Potential Work Window
8/18/2025	12:00	7.96	6:05	20:15	Potential Work Window
8/18/2025	12:30	7.28	6:05	20:15	Potential Work Window
8/18/2025	13:00	6.21	6:05	20:15	Potential Work Window
8/18/2025	13:30	4.77	6:05	20:15	Potential Work Window
8/18/2025	14:00	3.06	6:05	20:15	Potential Work Window
8/18/2025	14:30	1.29	6:05	20:15	Potential Work Window
8/18/2025	15:00	-0.18	6:05	20:15	Potential Work Window
8/18/2025	15:30	-1.05	6:05	20:15	Potential Work Window
8/18/2025	16:00	-1.25	6:05	20:15	Potential Work Window
8/18/2025	16:30	-0.72	6:05	20:15	Potential Work Window
8/18/2025	17:00	0.56	6:05	20:15	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/19/2025	6:30	4.29	6:07	20:13	Potential Work Window
8/19/2025	7:00	6.02	6:07	20:13	Potential Work Window
8/19/2025	7:30	7.41	6:07	20:13	Potential Work Window
8/19/2025	9:30	7.91	6:07	20:13	Potential Work Window
8/19/2025	10:00	7.45	6:07	20:13	Potential Work Window
8/19/2025	10:30	7.10	6:07	20:13	Potential Work Window
8/19/2025	11:00	6.93	6:07	20:13	Potential Work Window
8/19/2025	11:30	7.05	6:07	20:13	Potential Work Window
8/20/2025	12:00	7.39	6:08	20:11	Potential Work Window
8/20/2025	12:30	7.63	6:08	20:11	Potential Work Window
8/20/2025	13:00	7.55	6:08	20:11	Potential Work Window
8/20/2025	13:30	7.12	6:08	20:11	Potential Work Window
8/20/2025	14:00	6.24	6:08	20:11	Potential Work Window
8/20/2025	14:30	4.88	6:08	20:11	Potential Work Window
8/20/2025	15:00	3.11	6:08	20:11	Potential Work Window
8/20/2025	15:30	1.22	6:08	20:11	Potential Work Window
8/20/2025	16:00	-0.36	6:08	20:11	Potential Work Window
8/20/2025	16:30	-1.34	6:08	20:11	Potential Work Window
8/20/2025	17:00	-1.56	6:08	20:11	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/21/2025	6:30	1.14	6:09	20:09	Potential Work Window
8/21/2025	7:00	3.26	6:09	20:09	Potential Work Window
8/21/2025	7:30	5.31	6:09	20:09	Potential Work Window
8/21/2025	8:00	7.03	6:09	20:09	Potential Work Window
8/21/2025	10:00	7.94	6:09	20:09	Potential Work Window
8/21/2025	10:30	7.11	6:09	20:09	Potential Work Window
8/21/2025	11:00	6.41	6:09	20:09	Potential Work Window
8/21/2025	11:30	5.97	6:09	20:09	Potential Work Window
8/22/2025	12:00	5.91	6:11	20:07	Potential Work Window
8/22/2025	12:30	6.32	6:11	20:07	Potential Work Window
8/22/2025	13:00	6.96	6:11	20:07	Potential Work Window
8/22/2025	13:30	7.46	6:11	20:07	Potential Work Window
8/22/2025	14:00	7.59	6:11	20:07	Potential Work Window
8/22/2025	14:30	7.26	6:11	20:07	Potential Work Window
8/22/2025	15:00	6.34	6:11	20:07	Potential Work Window
8/22/2025	15:30	4.84	6:11	20:07	Potential Work Window
8/22/2025	16:00	2.93	6:11	20:07	Potential Work Window
8/22/2025	16:30	1.01	6:11	20:07	Potential Work Window
8/22/2025	17:00	-0.45	6:11	20:07	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/23/2025	6:30	-0.22	6:12	20:05	Potential Work Window
8/23/2025	7:00	1.16	6:12	20:05	Potential Work Window
8/23/2025	7:30	3.16	6:12	20:05	Potential Work Window
8/23/2025	8:00	5.23	6:12	20:05	Potential Work Window
8/23/2025	8:30	6.96	6:12	20:05	Potential Work Window
8/23/2025	10:30	7.57	6:12	20:05	Potential Work Window
8/23/2025	11:00	6.43	6:12	20:05	Potential Work Window
8/23/2025	11:30	5.41	6:12	20:05	Potential Work Window
8/24/2025	12:00	4.76	6:14	20:03	Potential Work Window
8/24/2025	12:30	4.56	6:14	20:03	Potential Work Window
8/24/2025	13:00	4.89	6:14	20:03	Potential Work Window
8/24/2025	13:30	5.70	6:14	20:03	Potential Work Window
8/24/2025	14:00	6.60	6:14	20:03	Potential Work Window
8/24/2025	14:30	7.20	6:14	20:03	Potential Work Window
8/24/2025	15:00	7.32	6:14	20:03	Potential Work Window
8/24/2025	15:30	6.88	6:14	20:03	Potential Work Window
8/24/2025	16:00	5.83	6:14	20:03	Potential Work Window
8/24/2025	16:30	4.29	6:14	20:03	Potential Work Window
8/24/2025	17:00	2.54	6:14	20:03	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/25/2025	6:30	1.06	6:15	20:01	Potential Work Window
8/25/2025	7:00	1.36	6:15	20:01	Potential Work Window
8/25/2025	7:30	2.39	6:15	20:01	Potential Work Window
8/25/2025	8:00	4.01	6:15	20:01	Potential Work Window
8/25/2025	8:30	5.82	6:15	20:01	Potential Work Window
8/25/2025	9:00	7.30	6:15	20:01	Potential Work Window
8/25/2025	10:30	7.96	6:15	20:01	Potential Work Window
8/25/2025	11:00	6.91	6:15	20:01	Potential Work Window
8/25/2025	11:30	5.53	6:15	20:01	Potential Work Window
8/26/2025	12:00	4.22	6:16	19:59	Potential Work Window
8/26/2025	12:30	3.34	6:16	19:59	Potential Work Window
8/26/2025	13:00	3.02	6:16	19:59	Potential Work Window
8/26/2025	13:30	3.25	6:16	19:59	Potential Work Window
8/26/2025	14:00	4.02	6:16	19:59	Potential Work Window
8/26/2025	14:30	5.12	6:16	19:59	Potential Work Window
8/26/2025	15:00	6.11	6:16	19:59	Potential Work Window
8/26/2025	15:30	6.67	6:16	19:59	Potential Work Window
8/26/2025	16:00	6.73	6:16	19:59	Potential Work Window
8/26/2025	16:30	6.27	6:16	19:59	Potential Work Window
8/26/2025	17:00	5.33	6:16	19:59	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/27/2025	6:30	3.61	6:18	19:57	Potential Work Window
8/27/2025	7:00	3.28	6:18	19:57	Potential Work Window
8/27/2025	7:30	3.50	6:18	19:57	Potential Work Window
8/27/2025	8:00	4.18	6:18	19:57	Potential Work Window
8/27/2025	8:30	5.23	6:18	19:57	Potential Work Window
8/27/2025	9:00	6.48	6:18	19:57	Potential Work Window
8/27/2025	9:30	7.52	6:18	19:57	Potential Work Window
8/27/2025	10:30	7.90	6:18	19:57	Potential Work Window
8/27/2025	11:00	7.22	6:18	19:57	Potential Work Window
8/27/2025	11:30	6.07	6:18	19:57	Potential Work Window
8/28/2025	12:00	4.62	6:19	19:55	Potential Work Window
8/28/2025	12:30	3.19	6:19	19:55	Potential Work Window
8/28/2025	13:00	2.13	6:19	19:55	Potential Work Window
8/28/2025	13:30	1.68	6:19	19:55	Potential Work Window
8/28/2025	14:00	1.81	6:19	19:55	Potential Work Window
8/28/2025	14:30	2.45	6:19	19:55	Potential Work Window
8/28/2025	15:00	3.54	6:19	19:55	Potential Work Window
8/28/2025	15:30	4.78	6:19	19:55	Potential Work Window
8/28/2025	16:00	5.77	6:19	19:55	Potential Work Window
8/28/2025	16:30	6.33	6:19	19:55	Potential Work Window
8/28/2025	17:00	6.47	6:19	19:55	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/29/2025	6:30	6.08	6:21	19:53	Potential Work Window
8/29/2025	7:00	5.64	6:21	19:53	Potential Work Window
8/29/2025	7:30	5.37	6:21	19:53	Potential Work Window
8/29/2025	8:00	5.43	6:21	19:53	Potential Work Window
8/29/2025	8:30	5.75	6:21	19:53	Potential Work Window
8/29/2025	9:00	6.20	6:21	19:53	Potential Work Window
8/29/2025	9:30	6.77	6:21	19:53	Potential Work Window
8/29/2025	10:00	7.29	6:21	19:53	Potential Work Window
8/29/2025	10:30	7.46	6:21	19:53	Potential Work Window
8/29/2025	11:00	7.15	6:21	19:53	Potential Work Window
8/29/2025	11:30	6.43	6:21	19:53	Potential Work Window
8/30/2025	12:00	5.39	6:22	19:51	Potential Work Window
8/30/2025	12:30	4.12	6:22	19:51	Potential Work Window
8/30/2025	13:00	2.80	6:22	19:51	Potential Work Window
8/30/2025	13:30	1.68	6:22	19:51	Potential Work Window
8/30/2025	14:00	1.04	6:22	19:51	Potential Work Window
8/30/2025	14:30	0.98	6:22	19:51	Potential Work Window
8/30/2025	15:00	1.39	6:22	19:51	Potential Work Window
8/30/2025	15:30	2.24	6:22	19:51	Potential Work Window
8/30/2025	16:00	3.46	6:22	19:51	Potential Work Window
8/30/2025	16:30	4.72	6:22	19:51	Potential Work Window
8/30/2025	17:00	5.71	6:22	19:51	Potential Work Window

APPENDIX TABLE XX

PREDICTED POTENTIAL SHORELINE WORK WINDOWS AT MARCH POINT LANDFILL

(APRIL 1, 2024 TO OCTOBER 31, 2024) [1]

Date	Time	Tide Elevation (ft MLLW)	Predicted Sunrise Time	Predicted Sunset Time	Work Window?
8/31/2025	6:30	6.99	6:23	19:49	Potential Work Window
8/31/2025	7:00	7.17	6:23	19:49	Potential Work Window
8/31/2025	7:30	7.10	6:23	19:49	Potential Work Window
8/31/2025	8:00	6.89	6:23	19:49	Potential Work Window
8/31/2025	8:30	6.74	6:23	19:49	Potential Work Window
8/31/2025	9:00	6.72	6:23	19:49	Potential Work Window
8/31/2025	9:30	6.72	6:23	19:49	Potential Work Window
8/31/2025	10:00	6.73	6:23	19:49	Potential Work Window
8/31/2025	10:30	6.83	6:23	19:49	Potential Work Window
8/31/2025	11:00	6.86	6:23	19:49	Potential Work Window
8/31/2025	11:30	6.62	6:23	19:49	Potential Work Window

FINAL WATER TREATMENT ENGINEERING DESIGN REPORT

WHITMARSH LANDFILL REMEDIATION
SKAGIT COUNTY
PROJECT US0041081.0037

Prepared for:

SKAGIT COUNTY, WASHINGTON

300 Desmond Dr. SE

MARCH 5, 2026

FINAL WATER TREATMENT ENGINEERING DESIGN REPORT CERTIFICATION

WSP USA Inc.





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Vice President, Environmental Engineering
Email: christopher.beck@wsp.com

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FINAL WATER TREATMENT ENGINEERING DESIGN REPORT

WHITMARSH LANDFILL REMEDIATION
SKAGIT COUNTY
PROJECT US0041081.0037

Prepared for:

Skagit County, Washington

Prepared by:

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March 5, 2026

TABLE OF CONTENTS

1 Introduction 1
1.1 Background 1
1.2 Project Permitting 1
2 Facility and Treatment Process Description 2
2.1 Water Quantity, Quality and Treatment Goals 2
2.2 Treatment Requirements 3
2.3 Treatment Process Overview 5
3 System Construction and Operations 9
4 References 10

FIGURES

Figure 1 Site Vicinity
Figure 2 Site Features Locations
Figure 3 Block Flow Diagram
Figure 4 Process Flow Diagram

TABLES

Table 1 Allowable Discharge Standards

APPENDICES

Appendix A Washington State Department of Ecology Documents
Appendix B Technical Information

LIST OF ACRONYMS

AAO	Amended Administrative Order
Bay	Padilla Bay Inner Lagoon
BMP	Best Management Practice
CESF	Chitosan Enhanced Sand Filtration
City	City of Anacortes
CO_2	carbon dioxide
CTAPE	Chemical Technology Assessment Protocol - Ecology
Ecology	Washington State Department of Ecology
FOG	fats, oil, and grease
GAC	granular activated carbon
gpm	gallons per minute
GULD	General Use Level Designation
HLR	hydraulic load rate
NEPA	National Environmental Policy Act
NTU	nephelometric turbidity unit
O&M	operations and maintenance
PAC	polyaluminum chloride
SEPA	State Environmental Policy Act
Site	March Point (Whitmarsh) Landfill
SOP	standard operating procedure
SPCC	Spill Prevention, Control, and Countermeasure Plan
TAPE	Technology Assessment Protocol – Ecology
TSS	total suspended solids
WAC	Washington Administrative Code
WSP	WSP USA Inc.
WTEDR	Water Treatment Engineering Design Report

1 INTRODUCTION

This Water Treatment Engineering Design Report (WTEDR) has been prepared by WSP USA Inc. (WSP) on behalf of Skagit County for treatment of groundwater and construction wastewater and stormwater that will be generated by the remediation activities at March Point (Whitmarsh) Landfill planned for April to December 2026. This WTEDR provides sufficient information to allow for the design, construction, and operation of an industrial water treatment system.

1.1 BACKGROUND

The Whitmarsh Landfill (Site) is in the City of Anacortes (City) in Skagit County in northwestern Washington (Figure 1). The Site began as an illegal public dump in the 1950s and was taken over and operated as a solid waste facility by Skagit County from 1961 until 1973. The Site was closed in 1973 in accordance with the regulations in effect at that time by placing a 2–3-foot soil cap over the landfill. Two-thirds of the Site was occupied by a cedar log mill between the 1980s and early 2000s. Following its closure, building foundation slabs and partially dismantled building parts remained. From 2014 to 2015, about 44,000 yards of wood waste from the sawmill operation were hauled off-site, while approximately 13,000 cubic yards of residual wood waste mixed with rocks remain on-site. The remnant structures were subsequently demolished in 2022.

The Site is located on Padilla Bay Inner Lagoon (Bay), which connects to the Pacific Ocean. In the early 2000s, contaminated groundwater seeps into the Inner Lagoon were identified, and the Washington State Department of Ecology (Ecology) determined that remedial action was needed. The Site was listed on Ecology's Hazardous Sites List as Facility Site ID 2662. In 2021, Ecology and Skagit County signed a Consent Decree (No. 21-2 00194 29) for the cleanup of the landfill.

Cleanup activities include regrading the Site to create a central mound by excavating the perimeter of the landfill and placing the excavated material in the central area and capping the Site with an engineered, low-permeability cap. Much of the excavated material is saturated, so groundwater will need to be removed, treated on-site, and discharged. The project plans to discharge the wastewater/groundwater recovered during regrading into the Bay and discharge the miscellaneous wastewater generated after regrading to the sanitary sewer. The latter will also serve as a contingency discharge option during regrading.

Figure 2 shows the anticipated Site layout during remediation, including the locations of the treatment system, outfall to surface water, and the point of discharge to the sanitary sewer.

1.2 PROJECT PERMITTING

The project will be conducted under the Model Toxics Control Act and is, therefore, exempt from local and certain state permitting. The construction project has received Permit No. NWS-2021-477 from the U.S. Army Corps of Engineers. Ecology's Surface Water group issued Construction Stormwater Discharge Permit (No. WAR 313996) for construction activities to Skagit Country. Subsequently, Ecology issued an Amended Administrative Order to allow discharge of treated water into the Bay. Also, Ecology's Shorelands and Environmental Assistance team reviewed the project and issued "Substantive Water Quality Certification Requirements" for the project. The documents issued by Ecology are included in Appendix A.

This WTEDR has been prepared for Ecology's Industrial Wastewater group to obtain a discharge permit to allow discharge of treated water into the City of Anacortes. Once the project receives Ecology's Industrial Wastewater Discharge Permit, then an application will be submitted to the City of Anacortes Wastewater Treatment Plant to obtain the City's Discharge Permit.

2 FACILITY AND TREATMENT PROCESS DESCRIPTION

2.1 WATER QUANTITY, QUALITY AND TREATMENT GOALS

The wastewater to be treated has been contaminated by residual wood waste and landfill waste from heterogeneous industrial and household waste. This section follows the requirements in Washington Administrative Code (WAC) 173-240-130 for construction of industrial wastewater facilities and requirements of the WTEDR pursuant to Section S8.D.3. Specific requirements for the WTEDR designated by the Department of Ecology are included as italicized text to highlight where relevant information has been included. Ecology's WTEDR requirements are included in Appendix A.

(c) The quantity and quality of water used by the industry and a description of how it is consumed or disposed of including

(i) The quantity and quality of all process wastewater and method of disposal

The quantity and quality of the groundwater requiring treatment will vary daily, depending on the location of remediation and how far along the project has progressed laterally. Over the duration of the project, it is assumed that approximately 4 to 5 million gallons of water will be treated and discharged over an approximately three- to four-month period. The amount of water is expected to generally decrease as the project advances. The treatment system has been sized for a maximum flow rate of 300 gallons per minute (gpm) to meet the maximum assumed treatment requirements. Should the amount of groundwater extracted in a given day exceed the system storage and treatment, it may be recirculated through the waste until system capacity catches up.

The treated water will be discharged to the surface water through an outfall as the primary option. Discharge to the sanitary sewer is considered a secondary, contingency option during Site regrading but will be the primary option after the regrading and groundwater extraction ends and the outfall is removed. Potentially, up to 1 million gallons may be discharged, as a contingency option, during Site regrading and up to 100,000 gallons will be discharged after that, when the outfall to surface water is removed. The maximum allowable discharge rate to the sanitary sewer is 88 gpm with a daily maximum discharge of 127,000 gallons per day, as conveyed by the City's Wastewater Treatment Plant. The treatment system is designed with a total of nine, 20,000-gallon capacity treatment tanks. The actual discharge to the sanitary sewer will be limited to the allowable discharge rate of 88 gpm.

Water quality estimates were developed using groundwater samples collected in October 2021 and January 2022. The summary of the analytical test results and lab reports are included in Appendix B. Concentrations of contaminants vary depending on the location, so conservatively, maximum contaminant concentrations from all wells have been used as the baseline for the water requiring treatment. The extracted groundwater turbidity will be adversely impacted during excavation. Suspended sediment is the primary constituent in construction stormwater and is commonly measured as total suspended solids (TSS) and/or turbidity. Estimated turbidity for construction water can be as high as 5,000 Nephelometric Turbidity Units (NTU). We are assuming an average turbidity level of 3,000 NTU for our treatment requirements. TSS is estimated to be 2,500 milligrams per liter (mg/L).

e) The basic design data and sizing calculations of the treatment units

Water treatment system sizing calculations were made using the quantities and contaminant levels stated above and are included in Appendix B. In some instances, the sizing was determined in consultation with experienced mobile water treatment vendors who have experience treating construction water.

t) A statement regarding compliance with any state or local water quality management plan or any plan adopted under the Federal Water Pollution Control Act as amended

The discharge of treated wastewater on this project is regulated by Ecology's Surface Water group when discharging to the surface water, and by Ecology's Industrial Wastewater group and the City of Anacortes

Wastewater Treatment Plant when discharging to the sanitary sewer. The system has been designed to meet all three allowable discharge standards. Table 1 shows the anticipated water quality and indicator levels and discharge limits that treated water is expected to meet. The contaminants of concern are highlighted in red and the percent removal required for each contaminant of concern is also included for contaminants requiring treatment.

The contaminants that were considered for treatment are turbidity, silver, iron, and various trace organic contaminants. pH can be impacted by chemical addition, and pH adjustment may be required to achieve the discharge requirements. To treat trace organic contaminants—iron, TSS, and turbidity must be removed sufficiently to ensure they do not interfere with polishing treatment.

o) Where discharge is to a municipal sewerage system, a discussion of that system's ability to transport and treat the proposed industrial waste discharge without exceeding the municipality's allocated transport and treat the proposed industrial waste discharge without exceeding the municipality's allocated industrial capacity. Also, a discussion on the effects of the proposed industrial discharge on the use or industrial capacity.

During our conference call on 25 February 2025 with Ecology representatives and officials from the City of Anacortes and Skagit County, the City stated that the allowable discharge limits they provided (88 gpm, 127,000 gallons daily) meet their system capacity, and Ecology agreed that no system capacity evaluation is needed, as long as those limits are met by the project. As shown in Table 1, in all cases, the surface water discharge limits are the same or more stringent than discharge limits for the sanitary sewer.

During the 25 February conference call, City officials expressed concerns about the potential high salinity of the groundwater. The available test results (Appendix B) from the monitoring wells indicated the salinity in the groundwater ranges between 0.15 to 0.95 grams/kilogram depending on the location, or between 0.015 and 0.095 percent. This level of salinity for 127,000 gallons (8.34 pounds per gallon) will result in discharge of between 159 and 1,010 pounds daily, which is well below the City's allowable salinity discharge limit of 3,400 pounds per day.

x) A statement regarding compliance with SEPA and NEPA if applicable

A State Environmental Policy Act (SEPA) checklist was prepared for the project, which was approved by Ecology's Toxics Cleanup Program overseeing the remediation. The project and the treatment system comply with the approved SEPA checklist.

2.2 TREATMENT REQUIREMENTS

v) Discussion of the various alternatives evaluated, if any, and reasons they are unacceptable

Available treatment options for different contaminants of concern were considered before determining a process treatment train. The Stormwater Management Manual for Western Washington provides guidance on measures to control the quantity and quality of stormwater that may be discharged under a Construction Stormwater General Permit (Ecology 2024a). The manual was used to determine the acceptable treatment approaches for Whitmarsh water discharges. Chemically treated stormwater discharged from construction sites must be nontoxic to aquatic organisms, and the Chemical Technology Assessment Protocol - Ecology (CTAPE) must be used to evaluate chemicals proposed for stormwater treatment. Only chemicals approved by Ecology under the CTAPE may be used for stormwater treatment. The approved chemicals, allowable application techniques (batch treatment or flow-through treatment), allowable application rates, and conditions of use can be found at Ecology's Emerging Technologies website. Similarly, the Technology Assessment Protocol – Ecology (TAPE) evaluates and classifies manufactured water treatment technologies for stormwater treatment (Ecology 2024b).

Ecology has three designations for chemical treatment technologies for construction runoff. The first category is a Pilot Use Level Designation, which allows limited treatment and restricts discharge, with the goal of producing data to evaluate new technologies. The second category is a Conditional Use Level Designation, which allows use but has strict monitoring requirements to safeguard discharge. General Use Level Designation (GULD) status is for approved technologies with unlimited use. Any manufactured treatment system selected for treatment of the groundwater at Whitmarsh should have GULD designation. In addition, any use of chemical treatment will have to comply with Best Management Practice (BMP) C250: Construction Stormwater Chemical Treatment and

BMP C251: Construction Stormwater Filtration. Some, though not all, of these BMP requirements are described below when going through treatment requirements.

The turbidity and TSS in the groundwater during construction/remediation activities is expected to be significant. Large particulates can be removed from groundwater via gravity settling. This should be the first treatment step to ensure additional treatment is efficient. Settling time should be at least 2 hours to remove as much TSS as possible without chemical addition or filtration. However, methods of removing turbidity without chemicals are not expected to be adequate to ensure compliance with the indicator levels for the water at Whitmarsh. Turbidity is difficult to control once fine particles are suspended in water on a construction site. Sedimentation is effective at removing larger particulate matter by gravity settling but is ineffective at removing smaller particulates, such as clay and fine silt. The reduction in turbidity by settling alone will be dependent on the particle size distribution of the sediment in the stormwater.

Iron is a contaminant of concern that requires a significant amount of removal both to achieve indicator levels and to ensure trace organic contaminants can be effectively removed without interference. In particular, optimum granular activated carbon (GAC) performance is achieved when iron levels are as low as possible. Kuraray (through its subsidiary Calgon Carbon) recommends non-detect (less than 0.1 part per million). Iron removal is typically achieved through oxidation followed by precipitation, coagulation, and/or filtration. Oxidizing the iron converts it from its dissolved form of ferrous to its less soluble ferric state, making it susceptible to precipitation and settling and/or filtration along with other bulk solids. The different options for oxidation include aeration or the addition of chlorine, potassium permanganate, hydrogen peroxide, or ozone. Oxidation via aeration is optimal because it minimizes chemical addition. Once iron is oxidized, it can be removed in bulk along with other metals (i.e., silver), TSS, and turbidity.

In order to remove fine particles, chemical precipitation is typically required to enhance particle size. Inorganic chemicals are used for coagulation, and polymers are added for flocculation, increasing particle size and speeding the settling process. The added chemicals destabilize the suspension and cause the smaller particles to co-precipitate. Application of coagulants at the appropriate dosage rate for optimum turbidity removal is important for treatment performance and to prevent aquatic toxicity. The optimum dose depends on several factors, including TSS concentration, the surface charge of particles, water temperature, pH, and the presence of constituents that consume or otherwise affect coagulant effectiveness. Coagulants, such as ferric chloride (or sulfate) or polyaluminum chloride (PAC), are typical for this project type, and they improve the settleability and/or filterability of the solids in water. Ferric chloride is the recommended coagulant for this water quality and system because it produces a denser floc, which will settle faster, and works in a wider pH range than most coagulants. However, PAC is also a great option and has been approved by CTAPE and thus may be a better option for this project.

Options for bulk removal of solids beyond gravity settling include chemical precipitation followed by filtration, sedimentation basins, solids contact clarifiers, plate or tube settlers, or ballasted flocculation. The amount of solids in the influent to the treatment system is expected to be significant—thus, solids settling is required prior to any physical filtration. Tanks that function as sedimentation basins are the preferred option for clarification over contact clarifiers due to the temporary nature of the treatment system and to minimize operation and maintenance (O&M) requirements.

Ecology requires filtration on all stormwater chemical treatment systems to lower chemical discharge and provide monitoring prior to discharge in flow-through chemical treatment systems. Additional coagulant can also be added to the stormwater immediately upstream of the filter so that coagulation and flocculation occur immediately prior to the filter. Chitosan Enhanced Sand Filtration (CESF) is a GULD-approved technology commonly used to address excess turbidity in stormwater treatment. Effective filtration with CESF requires 600 NTU turbidity or less, so a high percentage of solids will need to be removed with primary settling and chemically aided settling prior to CESF. CESF or similar filtration technologies are important to effectively remove TSS and turbidity to meet indicator levels and prevent solids from interfering with the additional polishing required to remove trace organic contaminants. The sand filtration system is required to continually monitor the stormwater effluent for turbidity and pH. If the discharge water is ever out of an acceptable range for turbidity or pH, the water must be returned to the front of the process where it will begin treatment again. Alternative filtration options to decrease solids include cloth or bag filters or alternative media. Given the high TSS load coming into this water treatment system, these options are not ideal from an O&M perspective.

CESF will effectively remove turbidity to meet discharge requirements but does not achieve removal of trace organic contaminants required to meet indicator levels. GAC can be used for trace organic removal to meet treatment goals for discharge. Other options for trace organics removal include advanced oxidation processes. However, while effective, these processes have the potential to produce disinfection byproducts, and they require more energy and are not as widely used as GAC. GAC is the preferred option for removing trace contaminants from water, particularly because this is a temporary treatment system.

pH must be in the proper range for the coagulants to be effective, which is typically 6.5 to 8.5. As coagulants and polymers tend to lower the pH, the ability to adjust pH on-site to meet treatment requirements is essential. A pH below 6.5 also creates a toxic condition for aquatic organisms. Stormwater may not be discharged without readjustment of the pH to above 6.5.

Prior to discharge, treated stormwater has to be sampled and tested for compliance with pH, flocculent chemical concentration, and turbidity limits per BMP C250. These limits are established by the Construction Stormwater General Permit. pH must be within the range of 6.5 to 8.5 standard units and not cause a change in the pH of the receiving water by more than 0.2 standard units. Verification sampling of the treated water will be collected from sample ports on the discharge side of the treated Water Holding Tanks by the construction management team.

Each project site using chemical treatment must have a trained operator who is certified for operation of an Enhanced Chemical Treatment system per BMP C250. The operator must be trained and certified by an organization approved by Ecology.

2.3 TREATMENT PROCESS OVERVIEW

g) A description of the treatment process and operation, including a flow diagram;

A block flow diagram and a detailed process flow diagram of the treatment process flow are shown as Figures 3 and 4, respectively. The figures show pretreatment of the groundwater influent for soluble iron and high TSS via oxidation, coagulation, and settling followed by filtration. This pretreatment will then be followed by GAC to remove the remaining contaminants of concern. A detailed breakdown of each treatment process is provided below.

Reservoir Tank. One Reservoir Tank is proposed to receive collected groundwater and to provide flow equalization from influent and system surges. The first opportunity for treatment involves managing the concentration of solids sent to the treatment system. The removal of solids can be achieved at the point of collection by filter fabric, sand bags, or gravel to remove the bulk suspended solids. The water can then be pumped to the Reservoir Tank. This tank will be used to manage any surge flows from backwashing and to equalize flow. From the Reservoir Tank, water will be pumped to Settling Tanks 1A/B.

Settling Tanks 1A/B. Two preliminary settling tanks, Settling Tanks 1A/1B, are recommended for primary settling prior to downstream aeration and chemical pretreatment. Under normal conditions, flows will be split between the two units. One unit can be taken offline during maintenance and cleaning, or if the system is operating at a reduced flow. The combined volume of the preliminary settling tanks provides 2 hours of settling, which should be sufficient time to settle out any readily settleable solids that do not require chemical addition. Influent and effluent pipe downcomers or tank baffling should be used to ensure no short circuiting occurs and keep tanks full. Removal of solids collected in Settling Tanks 1A/B will be performed as necessary and managed by the water treatment subcontractor.

Aeration Tank 2. Aeration Tank 2 will accept the effluent from Settling Tanks 1A/B and oxidize iron using aeration. Oxidation is required to effectively remove iron via precipitation and/or filtration. Oxidation can be achieved using an air compressor or blower and diffusor system to distribute air in Aeration Tank 2. This tank may also receive backwash from the CESF and GAC as required. Influent and effluent pipe downcomers or tank baffling should be used to ensure no short circuiting occurs and keep tanks full. Removal of solids accumulated in Aeration Tank 2 will be performed as necessary and managed by the water treatment subcontractor.

d) The amount and kind of chemicals used in the treatment process (if any)

Chemical Addition. The discharge line can be used for chemical injection between Aeration Tank 2 and Co-Precipitation/Settling Tanks 3A/B/C. The recommended process flow has chemical injection points for a polymer

called BHR-P50 (P50), which includes PAC and ferric chloride, and additional PAC and then +/-100 feet of 6-inch line required for effective mixing before a second injection point for carbon dioxide (CO_2) and sodium hydroxide to be used for pH adjustment (as needed). Both the polymer additive and the PAC and the polymer will aid in the precipitation and coagulation of contaminants.

Chemical precipitation is a widely accepted and effective method of removing metals, suspended solids, and organic compounds. PAC will introduce positively charged aluminum ions into water to bind to negatively charged particles, and the polymer component will aid in charge neutralization and bridging smaller particles into larger ones so that they can settle via gravity more quickly. Bench/jar testing shall be done at startup to determine an initial dose rate for treatment chemicals. The pH will be adjusted as needed using caustic (sodium hydroxide) and CO_2 to keep the pH to the range between 7 to 7.5 standard units to encourage flocculation and precipitation to ensure the pH of the water is within the limits established for surface water discharge. Chemical addition will be automated. In particular, 1 percent chitosan acetate and pH-adjustment chemicals will be automatically dosed by the CESF Water Quality Control Unit. Chemical addition will be in-line, and mixing will be achieved via an in-line static mixer.

A rundown of the type and anticipated amount of each treatment chemical is provided below. Overall amount of water to be treated by the system is expected to be 5 million gallons, with up to 30 percent of that flow going to the sanitary sewer. Note that the amount of chemical required can only be determined experimentally after treatment has commenced, so the total amount of chemicals provided below are only estimates.

Polyaluminum Chloride. PAC is an aluminum-based, positively charged, inorganic chemical containing aluminum, chloride, and hydroxide. PAC is a highly effective coagulant used in water treatment—it removes suspended solids, improves water clarity, and aids in the removal of iron and manganese. PAC is an Ecology GULD-approved wastewater treatment chemical. Any use of PAC will be in strict adherence to the Intended Use Guidelines set forth by Ecology. PAC is also being added via P50, but additional coagulant may be required relative to dose requirements for P50.

- Dose is expected to be around 50 mg/L.
- The specific gravity of the PAC is assumed to be around 1.25.
- Approximately 200 gallons of PAC will be used, with up to 30 percent of that potentially being discharged to the sanitary sewer.
- PAC should be removed along with TSS as part of the flocculation and settling and filtration processes and should not be released into the environment.

BHR-P50. P50 is a blended biopolymer and PAC formulation for wastewater clarification that aids settling in the Co-Precipitation/Settling Tanks. The unique hybrid is a "greener" alternative that exceeds the clarification performance of traditional and commodity treatment chemicals. Additionally, P50 produces denser solids that are more suitable for dewatering and disposal, resulting in reduced disposal and transportation costs. The denser solids that are produced are also ideal for systems using pretreatment settling tanks. P50 is an Ecology GULD-approved wastewater treatment chemical. Any use of P50 will be in strict adherence to the Intended Use Guidelines set forth by Ecology.

- Dose is expected to be a maximum of 300 mg/L.
- Approximately 1,428 gallons of P50 will be used over the course of the whole project, with 30 percent of that potentially being discharged to the sanitary sewer.
- P50 should be removed along with TSS as part of the flocculation and settling and filtration processes and should not be released into the environment.

CO_2 and 25 percent **sodium hydroxide** will be used for adjusting pH as required.

Co-Precipitation/Settling Tanks 3A/B/C. After in-line chemical addition and mixing, the water will flow to the Co-Precipitation/Settling Tanks 3A/B/C, with sampling ports after all three tanks. Influent and effluent pipe downcomers or tank baffling should be used to ensure no short circuiting occurs and to keep tanks full. The retention time of the tanks is approximately 3 hours, offering ample time for settling. The amount of solids in the influent to the treatment system is expected to be significant—thus, co-precipitation and clarification via settling

are required prior to any physical filtration. Metals, such as iron and silver, will also be removed by this process. These tanks may also receive water that does not meet discharge requirements. Solid collections out of the settling tanks will be performed as necessary and managed by the water treatment subcontractor.

CESF Water Quality Control Box and CESF. CESF will serve as the final solids removal mechanism for treatment of fine particulates, between 20 and 40 microns. It is generally recommended that the CESF system should be limited to influent turbidity levels of 600 NTU or less. Sand filters have high solids retention capacity and can provide removal of turbidity, TSS, metals, and some organics. CESF is a strong technology choice for removal of turbidity, and typically CESF can remove up to 95 percent of suspended solids from stormwater runoff. Sand filters do require maintenance to maintain flow-through conditions and will require backwashing or cleanout throughout the treatment period to maintain effectiveness.

The CESF Water Quality Control Box is a mechanism for automating chemical addition, backwashing, and water quality verification. It should be used to meet the Ecology requirements for flow-through discharge to waters of the state. It should follow each Ecology "Design Criteria for CESF Systems" requirement contained within the GULD for CESF. The CESF Water Quality Control Unit and CESF should also be designed to conform to BMP C250 and BMP C251. Effluent from the CESF will go back through the CESF Water Quality Control Box prior to being further treated to ensure compliance with pH and turbidity benchmarks and chemical residual requirements and is then sent to the GAC for additional polishing. The minimum-sized sand filter recommended for the design flow of 300 gpm is a skid-mounted 4 x 48-inch pod. A filter of this size has an operational flow rate of more than 450 gpm, but for this application, the larger sand bed is recommended to provide more sustainable operation and to compensate for additional flow from backwashing. Backwashes will be instigated by the CESF Water Quality Control Box via pressure drop across the sand filter system. Chitosan acetate (1 percent) addition is included to increase the particle size for effective filtration. To clean the filter media in each pod, water for backflushing is redirected from the filtered effluent in the other active pods and forced through the pod in the reverse direction. The flush water and particulates captured in the pod are conveyed to the Reservoir Tank. After injection with 1 percent chitosan acetate, the treated water flows through the upper filter header of the filter and is distributed evenly between all pods of the filter system (when not in backflush mode). The water passes through the pods while suspended sediment is captured by the filter bed.

- Chitosan acetate (1 percent) polymer will be added upstream of the CESF to aid in flocculation. It is a natural cationic biopolymer that is derived from chitin (typically crab and shrimp shells). The 1 percent solution is a clear, viscous liquid that is very stable and biodegrades rapidly in the environment. Chitosan has the ability to flocculate suspended sediment into larger particles, which can then be removed through settling and/or filtration. It is an Ecology GULD-approved wastewater treatment chemical. Any use of 1 percent chitosan acetate will be in strict adherence with the Intended Use Guidelines set forth by Ecology.
- Specific gravity is assumed to be around 1.05.
- Approximately, 4.8 gallons of 1 percent chitosan acetate is expected to be used over the course of the project, with up to 30 percent of that being discharged to the sanitary sewer.
- Chitosan acetate (1 percent) should be removed along with TSS as part of the flocculation and settling and filtration processes and should not be released into the environment.

GAC Filtration. Removal of organic contaminants, such as pesticides and volatile organic compounds, to ensure effluent meets indicator levels will be provided via three GAC vessels operated in series and each filled with approximately 10,000 pounds of 12 x 40 mesh virgin coconut GAC. The first two GAC vessels will serve as the lead vessels, with the point of compliance after the second vessel, and the third vessel will serve as the lag vessel. GAC is oleophilic and has a strong attraction for organic compounds and non-polar contaminants—readily adsorbing them onto its surface and holding them there via van der Waals forces. Adsorption is the primary mechanism by which GAC works, and it is frequently used to remove organic contaminants like chlorinated solvents and other industrial pollutants, pesticides, and select heavy metals. To meet flow and treatment requirements, the three GAC columns will be configured in series. Empty bed contact time, the time a liquid stream spends in contact with a treatment medium, is an important design component for GAC filtration. It should be at least 12 minutes to ensure effective treatment. Another important design parameter is hydraulic loading rate (HLR), or the volume of water flowing through a given area of the GAC bed. The HLR should be between 4 and 10 gpm/ft^2. Backwashing is not expected to be required due to the short duration that treatment is required. GAC has an extremely high

capacity for contaminant removal but will need to be replaced if the filter bed loses the capacity for reduction of the target constituents.

If GAC media is used to its full capacity while on-site, it is considered spent carbon and will require off-site disposal or thermal regeneration by a commercial carbon vendor. An effect of thermal regeneration of spent media is simultaneous destruction of the compounds within it. Therefore, any hazardous contaminants in the spent media will be destroyed off-site and will not require management. The spent GAC is typically removed from the bed by a GAC supplier, fresh carbon is added to the bed, and the spent carbon is transported to the carbon supplier's thermal regeneration facility. Thermal regeneration is typically included in the price of carbon, and no additional fee is assessed for regeneration. Prior to sending spent carbon to a regeneration facility, there may be a requirement from the carbon vendor to test the carbon to confirm that it can be accepted for regeneration.

Holding Tanks 4A/B. Two effluent holding tanks, Effluent Tanks 4A/B, are included to provide a holding period to ensure effluent that does not meet the pH, residual chemical, and turbidity requirements can be recycled back to the front of the process. The tanks also provide sufficient holding capacity for treated water to be tested for indicator levels to confirm the adequacy of the treatment process prior to discharge.

Solids Handling. Most solids will be captured in Settling Tanks 1A/B/C and Co-Precipitation/Settling Tanks 3A/B/C. Tanks can be emptied of water when the treatment system is not operating. The system is also designed to allow isolation of a single tank for maintenance while the system is operating at a lower flow rate. Solids will be removed using a vacuum truck and stored on-site for characterization and off-site disposal. Solids from the sand filter will be recycled and captured in settling tanks when sand filters are backwashed

h) All necessary maps and layout sketches;

All relevant figures are attached.

i) Provisions for bypass, if any;

No provisions for bypass are required. If treatment capacity cannot meet treatment needs, then recirculation of groundwater will occur on-site by excavating infiltration pond(s) away from the excavation areas.

q) A statement expressing sound engineering justification through the use of pilot plant data, results from other similar installations, or scientific evidence from the literature, or both, that the effluent from the proposed facility will meet applicable permit effluent limitations or pretreatment standards, or both

The proposed unit processes (iron oxidation, solids coagulation, flocculation, sedimentation, sand filtration, and GAC filtration) are well established technologies that are practiced in industrial and municipal water treatment systems throughout the country. Given the established state of each unit process, records on similar systems, and experience with many similar systems, no pilot work was needed or performed. Treatment vendors who have experience treating construction water with high TSS were consulted to develop a preliminary process design and the primary contractor, Strider Construction Inc, will be required to subcontract a mobile treatment vendor with extensive experience in this type of water treatment and operations.

Coagulation and settling using PAC can reasonably be expected to remove a high proportion of solids. Previous project experience and literature indicate that the solids removal will be between 60 and 90 percent of solids.

Sand filters have high solids retention capacity and can provide removal of turbidity, TSS, metals, and some organics. Sand filtration is a robust technology choice for secondary removal of turbidity, and typically sand filters will remove greater than 93 percent of suspended solids from stormwater runoff. Sand filters do require maintenance to maintain flow-through conditions and will likely require backwashing or cleanout during the treatment period.

GAC is oleophilic and has a strong attraction for organic compounds and non-polar contaminants—readily adsorbing them onto its surface and holding them there via van der Waals forces. Adsorption is the primary mechanism by which GAC works, and it is frequently used to remove common disinfection byproducts (e.g., trihalomethanes); organic contaminants like chlorinated solvents; and other industrial pollutants, pesticides, and select heavy metals like lead and mercury.

k) Results to be expected from the treatment process including the predicted wastewater

The treatment process is expected to treat the wastewater sufficiently to meet the requirements for discharge to surface water and the City of Anacortes Water Treatment Plant, as shown in Table 1. Bulk iron and solids will be removed via oxidation, coagulation, and settling. Additional solids polishing will occur via a chemically enhanced sand filtration system. Organic contaminants of concern can then be removed using a GAC system.

3 SYSTEM CONSTRUCTION AND OPERATIONS

(s) who will own, operate, and maintain the system after construction

The treatment equipment and operations will be provided by a water treatment specialty subcontractor to the remediation contractor, Strider Construction Inc. The system will be operated by a CESF-certified operator, provided by the specialty subcontractor. The treatment system is a temporary system for the construction phase (April through November 2026) and will be removed upon completion of construction. Strider Construction Inc and their specialty subcontractor will be responsible for the final design of the water treatment system to meet the required discharge standards.

The CESF-certified operator will follow the sampling and testing (checks and balances) of the system in accordance with the required practices to make sure the system operates as intended. Initially, two batches of treated water will be generated and tested by an accredited analytical laboratory to verify the treatment system is achieving the desired discharge standards, Once Ecology's Surface Water group approves the test results, then the water will be discharged. Subsequently, continuous discharge and in-line sampling will occur, as stated in the Administrative Order and Amendment. Additional sampling and/or testing after each component of the treatment system will be conducted based on the needs of the operator and the designer(s). If any exceedances are detected, the discharge will be stopped and the water recirculated through the system and tested in batches again, approved, then discharge will continue.

j) Physical provision for oil and hazardous material spill control or accidental discharge prevention or both;

The entire Site is unpaved and will remain unpaved. Should any spills occur, the product will infiltrate into the landfill. Therefore, unwanted releases of products/chemicals to the environment or the sanitary sewer will not be possible.

One important health and safety consideration is a plan for prevention and mitigation of spills of oil and hazardous chemicals that are stored on-site. Fats, oil, and grease (FOG) are not expected to be parameters of concern for this groundwater, and thus the treatment process is not designed to remove it at high concentrations. However, the initial storage tank for water treatment will have adsorbant material to capture any light non-aqueous phase liquids that are in the wastewater. In addition, large amounts of FOG are not expected to be stored or used on-site, negating the need for a Spill Prevention, Control, and Countermeasure Plan (SPCC) that is required under the Clean Water Acts SPCC Rule for storage of certain amounts of FOG. However, the truck traffic and equipment used throughout the Site for remediation and treatment is a potential source for petroleum hydrocarbons, and numerous chemicals will be stored on-site as part of the water treatment process. Accordingly, the primary contractor and water treatment subcontractor will be responsible for taking steps on-site to prevent and manage any spills. Part of their scope will include standard operating procedures (SOPs) for guidance on handling chemicals, preventing spills, and mitigating actions should a spill take place. The important components of spill prevention and mitigation to be included in the SOP for handling chemicals on-site are listed below.

- Training
  - Familiarize operators with safety data sheets for all chemicals.
  - Train operators in hazards, disposal, and storage requirements for all chemicals.
  - Makes sure appropriate personal protective equipment is available and always used when near chemicals.

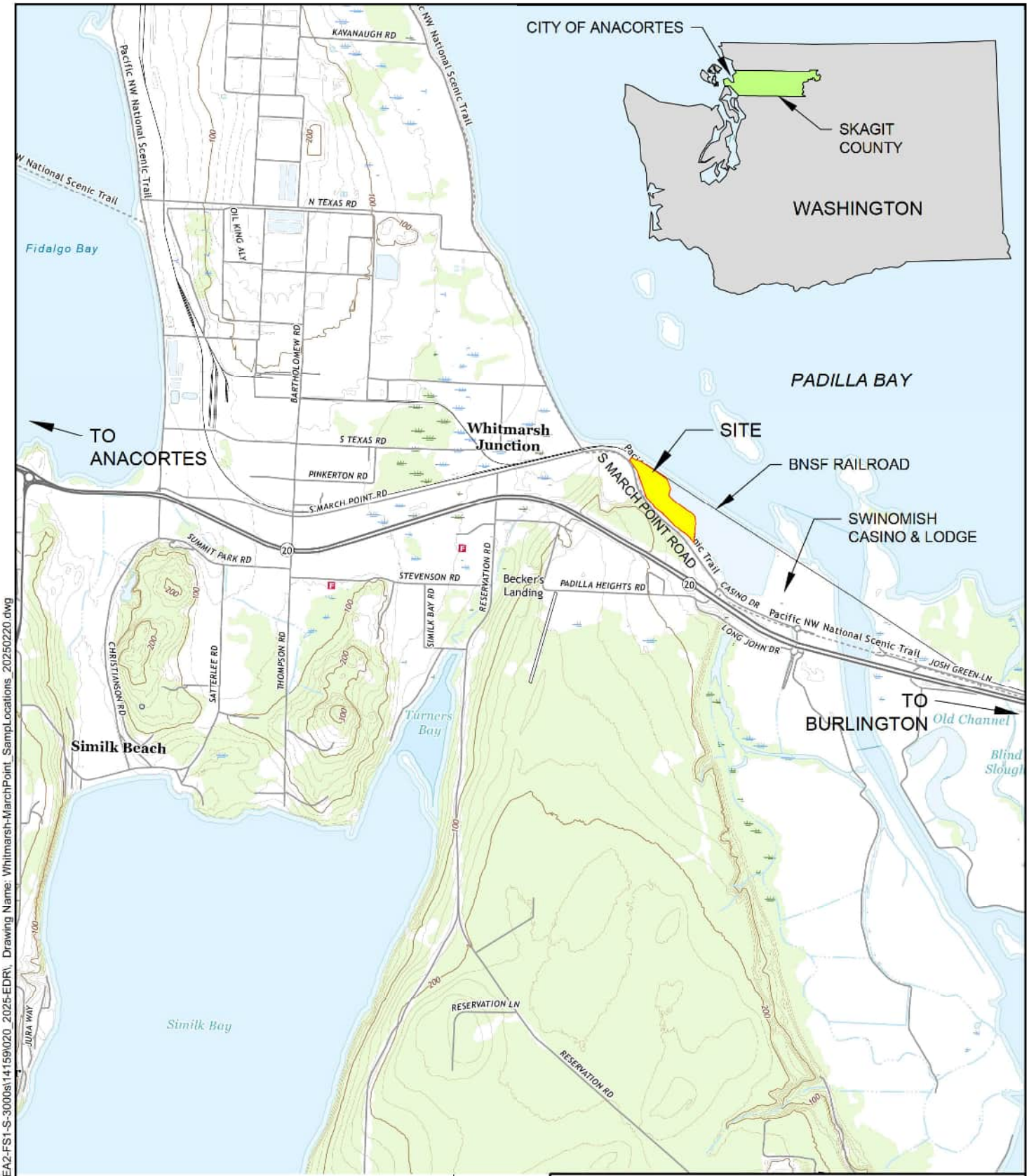
- Storage
  - Segregate chemicals based on compatibility.
  - Always store chemicals on secondary containment.
  - Minimize excess chemical storage on-site.
  - Store chemicals away from heat and direct light.
  - Make sure mobile safety showers and/or eyewashes are available near where chemicals are stored or handled.
- Handling
  - Provide spill kits, secondary containment, and leak-absorbent materials at strategic locations when handling chemicals or where chemicals are stored.
  - Regularly evaluate storage containers and piping to ensure equipment is not faulty.

4 REFERENCES

Department of Ecology, State of Washington (Ecology). 2024a. *Stormwater Management Manual for Western Washington* https://fortress.wa.gov/ecy/ezshare/wq/SWMMs/2024SWMMWW/Content/Resources/DocsForDownload/2024SWMMWW_6-14-24.pdf

Department of Ecology, State of Washington (Ecology). 2024b. Emerging stormwater treatment technologies (TAPE). Washington State Department of Ecology. September 2024. https://ecology.wa.gov/regulations-permits/guidance-technical-assistance/stormwater-permittee-guidance-resources/emerging-stormwater-treatment-technologies

FIGURES



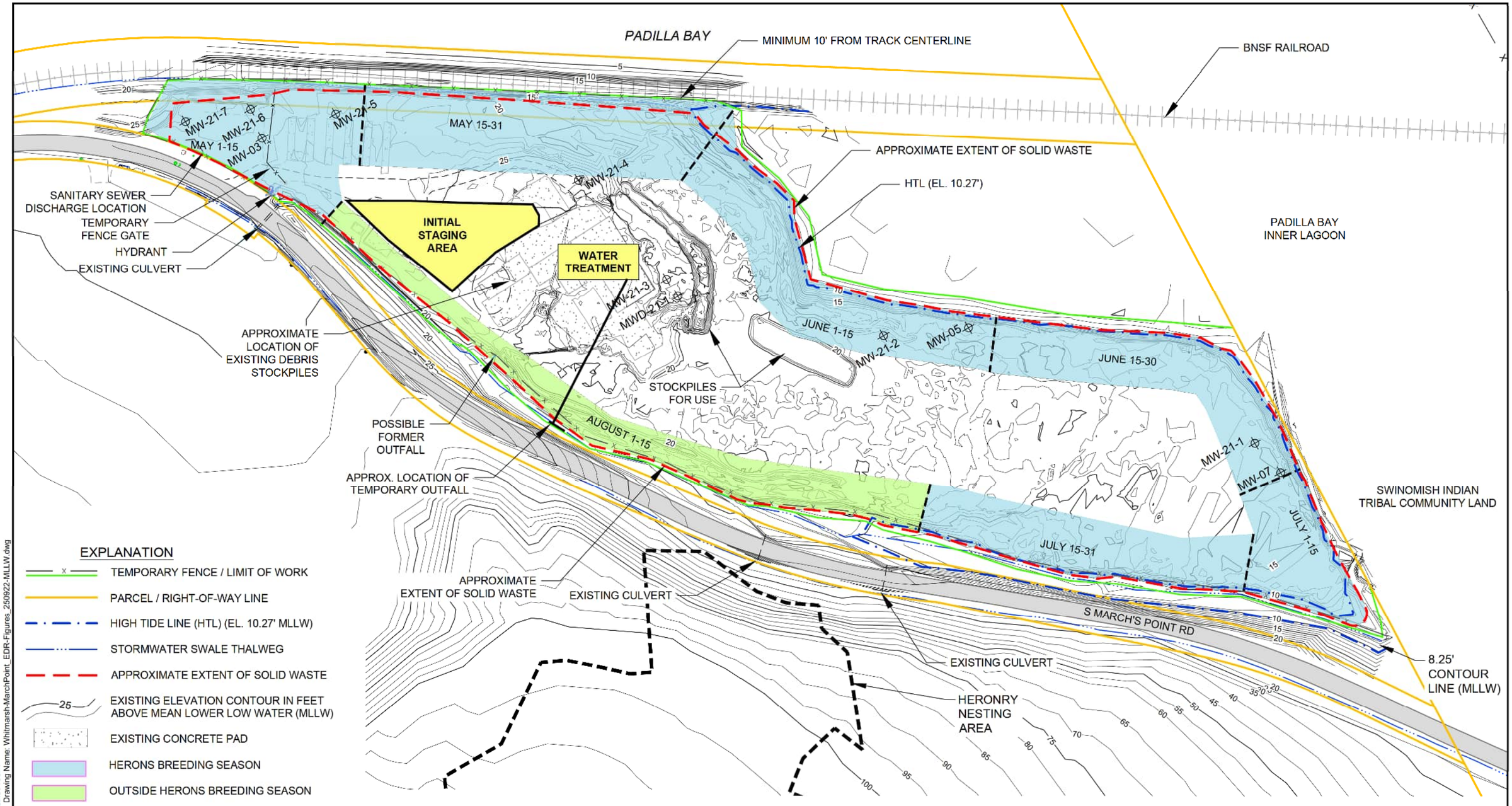
Base map courtesy USGS, WA_Anacortes_South

SCALE: 1" = 1/2 MILE

SITE VICINITY
March Point (Whitmarsh) Landfill
Anacortes, Washington

By: APS	Date: 02/20/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 1

Plot Date: 02/20/25 - 6:09pm, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\020_2025-EDR\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250220.dwg



EXPLANATION

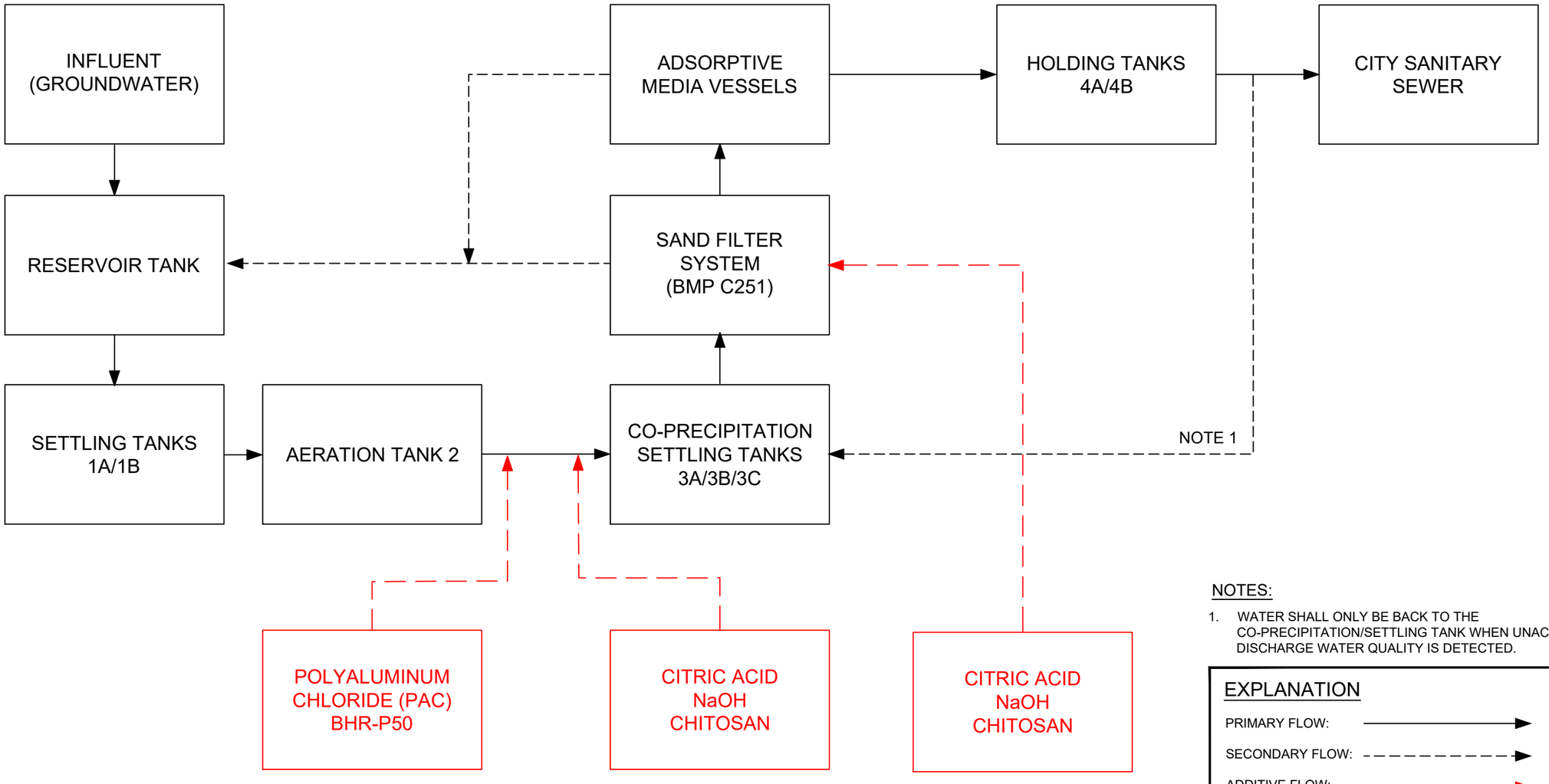
- TEMPORARY FENCE / LIMIT OF WORK
- PARCEL / RIGHT-OF-WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE
- EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING CONCRETE PAD
- HERONS BREEDING SEASON
- OUTSIDE HERONS BREEDING SEASON
- MW-21-3 MONITORING WELL

0 75 150
APPROXIMATE SCALE IN FEET

SKAGIT COUNTY WASHINGTON — Serving With Pride

CLIENT: SKAGIT COUNTY		PROJECT: MARCH POINT (WHITMARSH) LANDFILL, Anacortes, Washington	DATE: DECEMBER 2025
WSP USA Inc., 18300 Redmond Way, Suite 200, Redmond, Washington 98052	wsp	TITLE: SITE FEATURES LOCATIONS	SCALE: AS SHOWN; PROJECT NO.: US0041081.0037; FIGURE: 2

Plot Date: 12/02/25 - 10:36am, Plotted by: USAS719374
Drawing Path: G:\Whitmarsh\Report Figures\, Drawing Name: Whitmarsh-MarchPoint_EDR-Figures_250922-MLLW.dwg



ACRONYMS:

BMPs Best Management Practices
NaOH Sodium Hydroxide

NOTES:

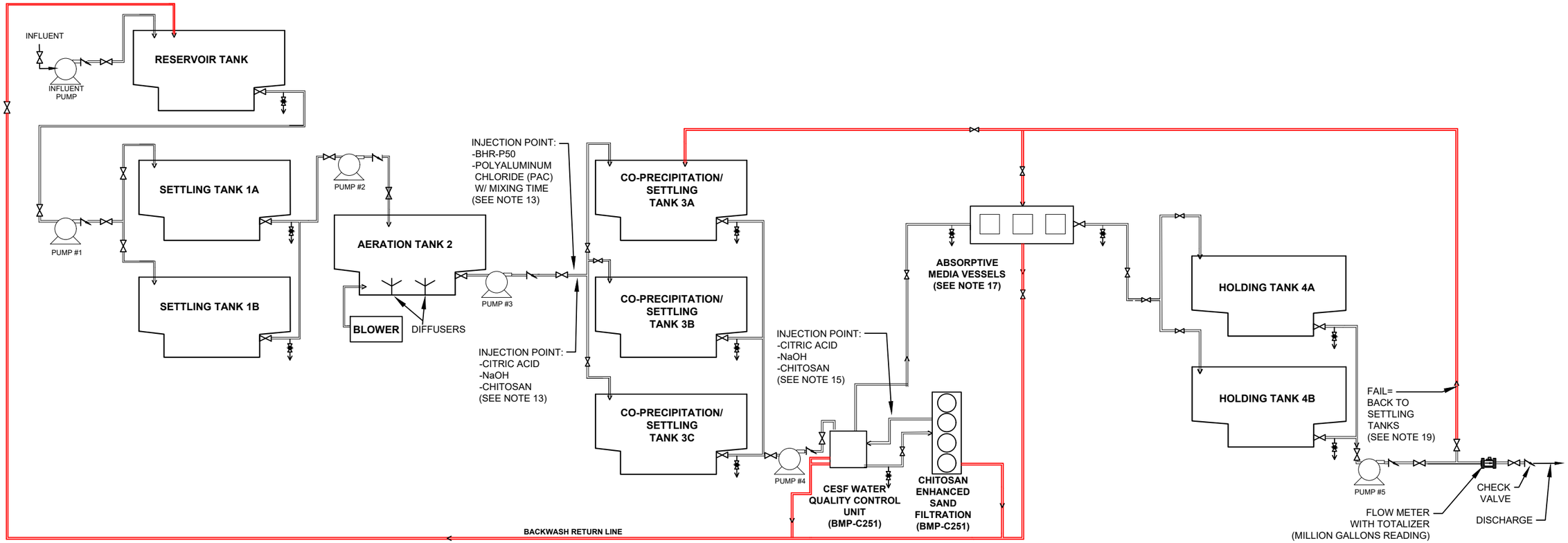
1. WATER SHALL ONLY BE BACK TO THE CO-PRECIPITATION/SETTLING TANK WHEN UNACCEPTABLE DISCHARGE WATER QUALITY IS DETECTED.

EXPLANATION

PRIMARY FLOW:
SECONDARY FLOW:
ADDITIVE FLOW:

CLIENT: SKAGIT COUNTY		PROJECT: MARCH POINT (WHITMARSH) LANDFILL, Anacortes, Washington	DATE: JANUARY 2026
WSP USA Inc., 18300 Redmond Way, Suite 200, Redmond, Washington 98052		TITLE: BLOCK FLOW DIAGRAM	SCALE: AS SHOWN; PROJECT NO.: US0041081.0037; FIGURE: 3

Plot Date: 01/29/26 - 8:53am, Plotted by: USAT145973
Drawing Path: C:\Users\USAT145973\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_142124\, Drawing Name: Whitmarsh-MarchPoint_EDR-Figures_250922-MLLW.dwg



EXPLANATION

- VALVE
- SAMPLE POINT
- CHECK VALVE
- PRESSURE GAUGE
- PRIMARY PROCESS FLOW
- SECONDARY FLOW

NOTES:

1. ALL TANKS SHALL BE 20,000 GALLON OPEN TOP TANKS. INFLUENT AND EFFLUENT PIPE DOWNCOMERS OR TANK BAFFLING SHALL BE USED IN ALL TANKS EXCEPT THE RESERVOIR TANK TO PREVENT SHORT CIRCUITING AND/OR TO MAINTAIN TANK LEVEL.
2. MAXIMUM FLOW OF SYSTEM SHALL BE 200 GALLONS PER MINUTE (GPM), UNLESS ALTERNATE FLOW RATE IS APPROVED BY THE ENGINEER.
3. FLOW METER FLOW RANGE SHALL BE 0 TO 300 GPM.
4. VALVES AND SAMPLE PORTS SHALL BE MADE OF RUST-PROOF METAL.
5. INSTALL, OPERATE, AND MAINTAIN THE SYSTEM STARTING THE DAY THE ENGINEER AUTHORIZES ITS OPERATION UNTIL THE ENGINEER INSTRUCTS TO DISCONTINUE.
6. RELOCATE THE SYSTEM AS NEEDED TO COMPLETE THE WORK.
7. THE ENGINEER WILL OBTAIN DISCHARGE PERMIT. ENGINEER WILL COLLECT AND ANALYZE WATER SAMPLES. CONTRACTOR SHALL ASSUME THAT ONLY BATCH DISCHARGES MAY BE MADE.
8. THE ENGINEER WILL OBTAIN APPROVAL TO DISCHARGE FROM THE CITY AND WILL NOTIFY CONTRACTOR. IF CITY DOES NOT APPROVE DISCHARGE, RETURN THE WATER TO THE SETTLING TANK AND TREAT AGAIN.
9. CLEAN AND DECONTAMINATE ALL COMPONENTS AT THE COMPLETION OF PROJECT. ENGINEER WILL COLLECT CONFIRMATION SAMPLES.
10. RESERVOIR TANK IS FOR MANAGEMENT OF SURGE FLOWS. TANKS 1 A/B ARE FOR COLLECTION AND FOR PRE-SETTLEMENT OF MATERIAL FROM THE SUMPS. FLOWS SHALL BE SPLIT INTO TWO OR ONE AND CAN BE ISOLATED DURING OPERATION FOR MAINTENANCE CLEANING. SIGNIFICANT SOLIDS EXPECTED TO SETTLE IN TANKS 1 A/B, REQUIRING FREQUENT MAINTENANCE TO EMPTY TANKS AND DISPOSE OF SOLIDS.
11. AERATION TANK 2 RECEIVES EFFLUENT FROM TANKS 1 A/B, AND IRON IS OXIDIZED. AERATION IS ACHIEVED WITH BLOWER OR COMPRESSOR AND AIR DIFFUSERS OR APPROVED EQUAL.
12. PUMPS #1, #2, #3, #4, AND #5 ARE 4" PUMPS PROTECTED FROM DRY OPERATION (E.G., LEVEL PROTECTION, DRI-PRIME DIESELS, ETC.).
13. PUMP #3 DISCHARGE LINE HAS CHEMICAL INJECTION POINTS FOR BHR-P50 AND POLYALUMINUM CHLORIDE (PAC), AND THEN +/-100' OF 6" LINE BEFORE A SECOND SERIES OF INJECTION POINTS FOR CITRIC ACID AND NaOH TO BE USED FOR pH ADJUSTMENT (AS NEEDED) AND 1% CHITOSAN TO HELP BUILD FLOC PRIOR TO DISCHARGE INTO THE TANKS. STATIC MIXERS WILL BE USED FOR INJECTION AND MIXING.
14. TANKS 3 A/B/C ARE USED FOR CO-PRECIPITATION OF METALS AND PRIMARY PRE-TREATMENT FOR THE CESF SYSTEM. SIGNIFICANT SOLIDS EXPECTED TO SETTLE IN TANKS 3 A/B/C, REQUIRING FREQUENT MAINTENANCE TO EMPTY TANKS AND DISPOSE OF SOLIDS.
15. THE CESF (CHITOSAN ENHANCED SAND FILTRATION) CONTROL BOX MEETS THE ECOLOGY REQUIREMENTS FOR THE FLOW-THROUGH DISCHARGE TO WATERS OF THE STATE, AND CAN ALSO DOSE CHITOSAN BEFORE THE SAND FILTER. CITRIC ACID AND NaOH CAN ALSO BE ADDED FOR FINAL pH CONTROL. IT IS FULLY AUTOMATED AND AUTOMATICALLY DOSES THE CHEMICALS, VALIDATES CESF EFFLUENT WATER QUALITY, BACKWASHES AND SENDS BACKWASH BACK TO THE RESERVOIR TANK, AND FEEDS THE ADSORPTIVE MEDIA VESSELS. CHITOSAN IS INJECTED AND MIXED VIA INLINE STATIC MIXER.
16. THE MINIMUM SIZED SAND FILTER IN THIS 200 GPM CONFIGURATION IS A 48" X 4 POD (THIS FILTER HAS AN OPERATIONAL FLOW RATE OF MORE THAN 450 GPM, BUT FOR THIS APPLICATION THE LARGER SAND BED PROVIDES A MORE SUSTAINABLE OPERATION.
17. THREE 10,000-LB NOMINAL CARBON MEDIA VESSELS CONTAINING 14,000 POUNDS (EACH) OF A 50/50 BLEND OF 12X40 MESH HYDROSIL HS-250-AC AND HS-MT ADSORPTIVE MEDIA SET IN SERIES OR LEAD/LAG CONFIGURATION PROVIDES SUFFICIENT EMPTY BED CONTACT TIME AND BREAKTHROUGH PROTECTION. FACE PIPING AND VALVING INCLUDING BACKWASHING TO BE INCLUDED WITH MEDIA PACKAGE. THE POINT OF COMPLIANCE WOULD BE THE SAMPLE PORT AFTER THE SECOND UNIT. THE EMPTY BED CONTACT TIME SHOULD BE GREATER THAN 10 MINUTES AND THE HYDRAULIC LOADING RATE SHOULD BE BETWEEN 2 AND 10 GPM/FT^2.
18. SYSTEM SHALL HAVE AN OPERATOR CERTIFIED FOR OPERATION OF AN ENHANCED CHEMICAL TREATMENT SYSTEM.
19. IF FLOW IS RECYCLED BACK TO THE SETTLING TANKS, INFLUENT PUMPING SHALL BE ADJUSTED TO ENSURE MAXIMUM FLOW REQUIREMENTS ARE NOT EXCEEDED.

ACRONYMS:

BMPs	Best Management Practices
GPM	Gallons Per Minute
NaOH	Sodium Hydroxide

SKAGIT COUNTY WASHINGTON — Serving With Pride

CLIENT	SKAGIT COUNTY
	WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052
PROJECT	MARCH POINT (WHITMARSH) LANDFILL Anacortes, Washington
TITLE	PROCESS FLOW DIAGRAM
DATE	JANUARY 2026
SCALE	AS SHOWN
PROJECT NO.	US0041081.0037
FIGURE	4

Plot Date: 01/29/26 - 8:53am Plotted by: USAT145973
Drawing Path: C:\Users\USAT145973\AppData\Roaming\GCDS_user\Temp-Dwg\AcPublish_142124\ Drawing Name: Whitmarsh-MarchPoint_EDR-Figures_250922-MLLW.dwg

TABLES

Table 1: Water Quality Data and Indicator Levels for Surface Water Discharge with Percent Removals Required for Compliance

Analyte	Max Influent Water Quality (µg/L)	Surface Water Quality Effluent Discharge Requirements (µg/L)	Percent Removal Required for Max	Department of Ecology Proposed Effluent Discharge Limits for the Anacortes WTP (ug/L)	Percent Removal Required	Proposed Anacortes WTP Effluent Discharge Requirements from the City of Anacortes (µg/L)	Percent Removal Required for Max
Petroleum Hydrocarbons							
BTEX	18[r]	2.0[a]	89			100	
TPH-G [b]	< 250[t]	250[a]	-	2,000		1,000	
TPH-D [c]	630[t]	250[a]	60	10,000		1,000	
Total Toxic Organics (TTO)	3,200[s]			2,000	38		
Oil and Grease	NA			75,000			
Oily Sheen						No visible Sheen	
Dissolved Metals							
Arsenic	7.3	-	-				
Barium	190	-	-				
Cadmium	< 4.0	-	-				
Chromium	< 10	-	-				
Iron	62,000	-	-				
Lead	< 1.0	-	-				
Mercury	< 0.50	-	-				
Selenium	< 5.0	NA	-				
Silver	< 10	NA	-				
Total Metals							
Aluminum	460[t]	240[d]	48				
Arsenic	8.6	69[e]	-	500			
Barium	290	1,000[f]	-				
Beryllium	< 1	1[a]	-				
Cadmium	< 4.4	42.25[e]	-	500			
Copper	9[t]	5.78[e]	36	3,000			
Chromium	12	1,100[g]	-	2,750			
Iron	85,000	300[h]	99.6				
Lead	42	221[e]	-	2,000		2,000	
Manganese	2,720[t]	100[i]	96.3				
Mercury	< 0.50	2118 ng/L[e]	-	100			
Molybdenum	15[t]	5.0[a]	67				
Nickel	6.4[t]	74.75[e]	-	2,500			
Selenium	< 5.6	290.58[e]	-				
Silver	< 11[u]	2.24[e]	80	1,000			
Strontium	218[t]	10[a]	95.4				
Thallium	< 0.2	1.0[a]	-				
Titanium	27[t]	10.0[a]	63				
Vanadium	13[t]	12.5[a]	3.8				
Zinc	50[t]	95.14[e]	-	5,000		5,000	
Polychlorinated Biphenyls (PBCs)							
PCBs, Total	0.11 / < 29[u]	10.0[e]	66	15.87	45.3		
Pesticides							
alpha-BHC	0.0073 / < 0.11[u]	0.05[a]	55				
4,4'-DDD	0.59	1.1[l]	-				
4,4'-DDE	0.70	1.1[l]	-				
4,4'-DDT	0.38	130 ng/L[e]	66				
Aldrin	3.2	0.71[a,k]	78				
Delta-BHC	0.067 / < 0.11[u]	0.05[a]	55				
Dieldrin	0.26	0.71[e]	-				
Endosulfan II	0.83	0.05[m]	94.0				
Gamma-Chlordane	1.1	0.05[a]	95.5				
Endosulfan sulfate	0.13	198 ng/L[a]	-				
Endrin Aldehyde	0.19	70 ng/L[a]	63				
Methoxychlor	0.11	0.05[n]	55				
Volatile Organic Compounds (VOC), Semi-VOCs, and Halogenated VOCS							
Acetone	NA	5.0[a]	-				
Benzoic Acid	NA	50[a]	-				
2-Butanone (MEK)	NA	5.0[a]	-				
n-Butylbenzene	NA	1.0[a]	-				
sec-Butylbenzene	NA	1.0[c]	-				
Butylbenzylphthalate	< 1.0	7.5[a]	-				
Carbazole	2.0	0.01[a]	99.5				
Carbon Disulfide	NA	10.0[a]	-				
Chlorobenzene	NA	18.0[a]	-				
Chloroethane	NA	2[a]	-				

Analyte	Max Influent Water Quality (µg/L)	Surface Water Quality Effluent Discharge Requirements (µg/L)	Percent Removal Required for Max	Department of Ecology Proposed Effluent Discharge Limits for the Anacortes WTP (ug/L)	Percent Removal Required	Proposed Anacortes WTP Effluent Discharge Requirements from the City of Anacortes (µg/L)	Percent Removal Required for Max
Dibenzofuran	**2.0**	**0.01[a]**	**99.5**				
Diethylphthalate	< 1.0	1.9[a]	-				
1,2-Dichlorobenzene	< 1.0	7.6[a]					
1,4-Dichlorobenzene	3.5	17.6[a]	-				
Cis-1,2-Dichloroethene	NA	4.8[a]	-				
2,4-Dimethylphenol	**3,100**	**8.1[a]**	**99.7**				
bis(2-ethylhexyl)phthalate	< 5.2	7.5[a]	-				
Isopropylbenzene	NA	1.0[a]	-				
2-methylphenol	**1,300**	**10[a]**	**99.2**				
(3+4) Methylphenol	**1,700**	**20[a]**	**98.8**				
4-Methyl-2-pentanone (MIBK)	NA	5.0[a]	-				
N-Nitrosodiphenylamine	1.3	2.0[a]	-				
Pentachlorophenol	**80**	**13[e]**	**84**				
Phenol	**7.8**	**4.5[a]**	**42**				
n-propylbenzene	NA	1.0[a]	-				
Tetrachloroethylene	NA	12.3[a]	-				
2,3,4,6-Tetrachlorophenol	NA	1.0[h]	-				
2,4,5-Trichlorophenol	**3.2**	**1[h]**	**69**				
1,2,4-Trimethylbenzene	NA	1[a]	-				
1,3,5-Trimethylbenzene	NA	1.0[a]	-				
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	2.1	5.7[a]	-				
Acenaphthylene	1.4	10.5[a]	-				
Benzo(a)anthracene	0.057	23.4[a]	-				
Benzo(a)pyrene	0.028	7.5[a]	-				
Benzo(b)fluoranthene	0.034	14.4[a]	-				
Benzo(g,h,i)perylene	0.016	12.3[a]	-				
Benzo(k)fluoranthene	0.011	7.5[a]	-				
Chrysene	0.16	7.5[a]	-				
Fluoranthene	< 0.62	6.6[a]	-				
Fluorene	1.6	5.7[a]	-				
Indeno(1,2,3-cd)pyrene	0.014	11.1[a]	-				
1-Methylnaphthalene	**14**	**10.0[a]**	**29**				
2-Methylnaphthalene	**16**	**10.0[a]**	**38**				
Naphthalene	**19**	**4.8[a]**	**75**				
Phenanthrene	1.4	16.2[a]	-				
Pyrene	< 0.50	5.7[a]	-				
Benzene	**18**	**-**	**-**	**70**		**5**	**72**
Dioxin/Furan Congeners							
1,2,3,6,7,8-Hexachlorodibenzo-PDioxin (HxCDD) (57653-85-7)	NA	50 pg/L[a]	-				
1,2,3,7,8,9-Hexachlorodibenzo-PDioxin (HxCDD) (19408-74-3)	NA	50 pg/L[a]	-				
1,2,3,4,6,7,8-Heptachlorodibenzo-P Dioxin (HpCDD) (35822-46-9)	NA	50 pg/L[a]	-				
1,2,3,4,6,7,8,9-Octachlorodibenzop-dioxin	NA	100 pg/L[a]	-				
2,3, 7,8-Tetrachlorodibenzofuran (TCDF) (51207-31-9)	NA	5 pg/L[a]	-				
1,2,3,4,6,7,8- Heptachlorodibenzofuran (HpCDF) (67562-39-4)	NA	50 pg/L[a]	-				
Octachlorodibenzofuran (OCDF) (39001-02-0)	NA	100 pg/L[a]	-				
Miscellaneous							
Conductivity (µmhos/cm)	2,000	-	-			10,000	
Salinity	1.0 (g/kg)	-	-			3,400 (lbs/day) 3.2 g/kg at 88 gpm	
pH (s.u.)	**8.6**	**6.5 - 8.5[p]**	**-**	**5.5-11**		**6-9**	
Turbidity	**3,000[q]**	**25 NTU [p]**	**99.2**				
Total Suspended Solids	**2,500 [q]**	**-**	**-**			**50,000**	**98**
Settleable Solids						**0**	
Nuisance Odors						No odors	

Notes:

a. No applicable surface water criterion—value is laboratory quantification level

b. NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosine, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils)

c. NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.

d. Acute Freshwater Criteria from “Final Aquatic Life Ambient Water Quality Criteria for Aluminum, Table K-1", United States Environmental Protection Agency; December 2018. Based on pH 7.0 and Total Hardness of 50 mg/L
e. Acute- Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
f. Applicable surface water criterion does not exist for barium. The indicator level is 1,000 µg/L for barium is based on groundwater quality standards to be protective of human health and the environment.
g. Indicator Level total chromium is actually for hexavalent chromium using Acute – Marine Water Toxic Substances (WAC173-201A-240) because there is no water quality standard for total chromium.
h. Organoleptic Effect Criteria, National Recommended Water Quality Criteria, United States Environmental Protection Agency.
i. The human health criteria for consumption of water+ organism from National Recommended Water Quality Criteria- Human Health Criteria Table (1993)/ Criteria for domestic water supply from the Quality Criteria for Water, 1986, “Gold Book”.
j. Total PCBs are the sum of all congener or all isomer or homolog or Aroclor analyses. Value is the Lowest Level of Quantification (LLOQ) for water samples for PCBs by EPA Method 8082A, Update V.
k. Acute – Freshwater Toxic Substances Criteria (WAC 173-210A-240)
l. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.
m. Acute Aquatic Life Criteria – Saltwater from EPA National Recommended WQ Criteria (2012).
n. Chronic Aquatic Life Criteria – Saltwater from Toxic Substances Criteria (WAC 173-201A-240) 2016.
o. Or equivalent.
p. This parameter is a Construction Stormwater General Permit Benchmark
q. This value is an estimate based on potential water quality following construction and remediation activities.
r. BTEX value based on benzene only; toluene, ethylbenzene, and xylenes not analyzed during most recent sampling events.
s. This value is calculated from the summation of quantifiable values greater than 0.01 mg/L for toxic organic compounds.
t. This value is based on maximum concentration of historic site groundwater samples collected from 2008-2013.
u. Maximum analyte reporting limit above most stringent Indicator Level.

Bold + Red = contaminant of potential concern (COPC).

Abbreviations:
µg/L = micrograms per liter;
µS/cm = microsiemens per centimeter;
mV = millivolts;
NA = not available
NTU = nephelometric turbidity unit;
s.u. = standard units

APPENDIX A

WASHINGTON STATE DEPARTMENT OF ECOLOGY DOCUMENTS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

November 25, 2024

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273
Sent by email only: margog@co.skagit.wa.us

RE: Coverage under the Construction Stormwater General Permit

Permit number:	**WAR313996**
Site Name:	**March Point (Whitmarsh) Landfill**
Location:	**9663 Marchs Point Rd**
	Anacortes, WA **County: Skagit**
Disturbed Acres:	**16.8**

Dear Margo Gillaspy:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective November 25, 2024.

Retain this letter as an official record of permit coverage for your site. You may keep your records in electronic format if you can easily access them from your construction site. You can get the CSWGP, permit forms, and other information at Ecology's CSWGP eCoverage Packet webpage[1]. Contact your Permit Administrator, listed below, if you want a copy of the CSWGP mailed to you. Please read the permit and contact Ecology if you have any questions.

Electronic Discharge Monitoring Reports (WQWebDMR)
This permit requires you to submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from the first full month of coverage to termination). Your first sampling and reporting period will be for the month of **December** and your first DMR must be submitted by **January 15, 2025**.

[1] http://www.ecology.wa.gov/eCoverage-packet

You must submit your DMRs electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to Ecology's WQWebPortal guidance webpage[2]. If you have questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/Option 3, or email WQWebPortal@ecy.wa.gov.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, please reference Ecology's Focus Sheet: *Appeal of General Permit Coverage*[3].

Annual Permit Fees
RCW 90.48.465 requires Ecology to recover the costs of managing the permit program. Permit fees are invoiced annually until the permit is terminated. Termination conditions are described in the permit. For permit fee related questions, please contact the Water Quality Fee Unit at wqfeeunit@ecy.wa.gov or (800) 633-6193/Option 2. You can also visit Water Quality Permit Fees Webpage[4] for more information.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact your Regional Inspector, Sylvia Graham of Ecology's Bellingham Field Office at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Questions or Additional Information
Ecology is here to help. Please review our Construction Stormwater General Permit webpage[5] for more information. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Melinda Wilson at melinda.wilson@ecy.wa.gov, or (360) 870-8290.

Sincerely,

Jeff Killelea, Manager
Permit and Technical Services Section
Water Quality Program

[2] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance
[3] https://apps.ecology.wa.gov/publications/summarypages/1710007.html
[4] https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Fees
[5] www.ecology.wa.gov/constructionstormwaterpermit

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

March 31, 2025

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Re: Administrative Order

Administrative Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill 9663 March's Point Rd Anacortes, WA 98221

Dear Margo Gillaspy:

The Department of Ecology (Ecology) is issuing the enclosed Administrative Order (Order) requiring Skagit County Public Works to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

If you have questions, please contact Sylvia Graham at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Sincerely,

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

Enclosure: Administrative Order Docket #23530

By Certified Mail# 9171 9690 0935 0233 1456 50

cc: Koorus Tahghighi, WSP USA Environment & Infrastructure Inc., koorus.tahghighi@wsp.com
David Horne, Ecology Toxics Cleanup Program, hoda461@ecy.wa.gov
PARIS Permit No. WAR313996

State of Washington
Department of Ecology

In the Matter of an Administrative Order Against Skagit County Public Works Margo Gillaspy Administrative Order Docket #23530

To: Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Administrative Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill 9663 March's Point Rd Anacortes, WA 98221

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

This is an Administrative Order in accordance with General Condition G12 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. Chapter 90.48.120(2) RCW authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

1. Order to Comply

Skagit County Public Works is subject to coverage under NPDES Construction Stormwater General Permit (CSGP) WAR313996 for construction activities associated with the construction site known as March Point (Whitmarsh) Landfill (9663 March's Point Rd, Anacortes, WA 98221). The project consists of 16.8 acres of disturbed acres. The proposed project comprises of cleanup of a historic landfill, Cleanup Site ID 304. The cleanup actions include excavating the perimeter of the site and redistributing existing solid waste and landfill cap to regrade the site and install an impermeable cap.

The receiving waterbody following treatment is Padilla Bay. Ecology was notified of the presence of onsite groundwater and/or soil contamination, which has the potential to discharge in stormwater and dewatering water due to the proposed construction activity. The Construction Stormwater General Permit does not have water quality sampling or

benchmarks for the known contaminants of concern, listed in Table 1, below; however, the permit requires compliance with the Water Quality Standards for Surface Waters of the State of Washington (Water Quality Standards – 173-201A WAC) and prohibits any discharges of pollutants.

The Order establishes Indicator Levels for the March Point (Whitmarsh) Landfill project. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from WAC 173-201A and the analytical method's minimum quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that Skagit County Public Works take the following actions. These actions are required at the location known as March Point (Whitmarsh) Landfill, located at 9663 March's Point Rd, Anacortes, WA 98221. In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

Skagit County Public Works must take the following actions to remain in compliance with NPDES Permit WAR313996:

- Install all pre-treatment and treatment systems prior to any discharge of contaminated dewatering water or contaminated construction stormwater to the receiving waterbody.
- Capture, contain, and treat all contaminated dewatering water or contaminated construction stormwater prior to discharge to the receiving waterbody.
- Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated construction stormwater. Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.
- All captured sediment from the treatment of the contaminated dewatering water or contaminated construction stormwater must be transported to an approved disposal facility based on the level of contamination.

The treatment system must have enough capacity to hold treated contaminated dewatering water or contaminated construction stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been met. No contaminated dewatering water or contaminated construction stormwater may be discharged before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, the treated contaminated dewatering water or contaminated construction stormwater must not be discharged to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Skagit County Public Works must modify the existing treatment to increase effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or groundwater off-site for disposal in an approved manner. Skagit County Public Works may also discharge to sanitary sewer with the approval of the proper sewer authority.

Once the effectiveness of the treatment system has been determined, Skagit County Public Works may revert to a flow-through treatment system after a minimum of two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design and batch sampling results must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all contaminated dewatering water or contaminated construction stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Skagit County Public Works must stop the discharge of treated contaminated dewatering water or contaminated construction stormwater to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Skagit County Public Works must modify the existing flow-through treatment system to increase its effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or contaminated dewatering water off-site for disposal in an approved manner. Skagit County Public Works may also discharge the treated water to sanitary sewer in accordance with the conditions of the discharge authorization from the proper sewer authority.
- Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports).
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the DMR.
- Any discharge to Waters of the State in exceedance of the contaminant Indicator Levels in Table 1 must be reported to the Department of Ecology according to Permit Condition S5.F, Noncompliance Notification as follows:
    - Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (206) 594-0000 (note that this is a new phone number as of 5/17/2021).
    - Cease the discharge until Indicator Levels can be met.
    - Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for the full written report requirements.
    - For exceedances of the numeric benchmark for pH, refer to Special Condition S4.D.4 of the CSGP.

- All monitoring data must be prepared by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC.
- All sampling data must be reported monthly on DMRs electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured concentration is below the detection level then Skagit County Public Works must report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.
- Contaminated soils excavated during construction will be immediately hauled offsite without stock piling to an approved disposal facility based on the level of contamination. When it is not feasible to immediately haul soils offsite, the soils must be placed in a covered area to minimize contact with stormwater.
- Noncompliance with permit requirements or the provisions of this Order (such as exceedances of indicator levels) must be immediately reported to the Northwest Region Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- The Stormwater Pollution Prevention Plan (SWPPP) prepared for March Point (Whitmarsh) Landfill must be fully implemented and amended as needed for the duration of the project.
- If a modification of the Order is desired, a written request must be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, it if appears necessary to further protect the public interest.

This Order does not exempt Skagit County Public Works from any Construction Stormwater General Permit requirement. This Order automatically terminates when NPDES Construction Stormwater General Permit WAR313996 is terminated.

Table 1. Marine/Brackish Water Parameters

Skagit County Public Works must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Skagit County Public Works uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
PETROLEUM HYDROCARBONS						
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/Weekly	Grab	2.0 [a]	SW 846 8021/ 8260	1.0	2.0
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/Weekly	Grab	250 [a]	NWTPH-Gx	250	250
METALS						
Aluminum, Total (7429-90-5)	Batch/Weekly	Grab	240 [d]	200.8	2	10
Arsenic, Total (7440-38-2)	Batch/Weekly	Grab	69 [e]	200.8	0.1	0.5
Barium, Total (7440-39-3)	Batch/Weekly	Grab	1,000 [f]	200.8	0.5	2.0
Beryllium, Total (7440-41-7)	Batch/Weekly	Grab	0.5 [a]	200.8	0.1	0.5
Cadmium, Total (7440-43-9)	Batch/Weekly	Grab	42.25 [e]	200.8	0.05	0.25
Chromium, Total (7440-47-3)	Batch/Weekly	Grab	1100 [g]	200.8	0.2	1.0
Copper, Total (7440-50-8)	Batch/Weekly	Grab	5.78 [e]	200.8	0.4	2.0
Iron, Total (7439-89-6)	Batch/Weekly	Grab	300 [h]	200.7	12.5	50
Lead, Total (7439-92-1)	Batch/Weekly	Grab	220.82 [e]	200.8	0.1	0.5

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Manganese, total (7439-96-5)	Batch/Weekly	Grab	100 [i]	200.8	0.1	0.5
Mercury, Total (7439-97-6)	Batch/Weekly	Grab	2118 ng/L [e]	1631E	0.2 ng/L	0.5 ng/L
Molybdenum, total (7439-98-7)	Batch/Weekly	Grab	0.5 [a]	200.8	0.1	0.5
Nickel, Total (7440-02-0)	Batch/Weekly	Grab	74.75 [e]	200.8	0.1	0.5
Selenium, Total (7782-49-2)	Batch/Weekly	Grab	290.58 [e]	200.8	1.0	1.0
Silver, Total (7440-22-4)	Batch/Weekly	Grab	2.24 [e]	200.8	0.04	0.2
Strontium (7440-24-6)	Batch/Weekly	Grab	3.85 [a]	200.7	0.77	3.85
Thallium, Total (7440-28-0)	Batch/Weekly	Grab	0.36 [a]	200.8	0.09	0.36
Titanium (7440-32-6)	Batch/Weekly	Grab	2.5 [a]	200.8	0.5	2.5
Vanadium (7440-62-2)	Batch/Weekly	Grab	12.5 [a]	200.8	2.5	12.5
Zinc, Total (7440-66-6)	Batch/Weekly	Grab	95.14 [e]	200.8	0.5	2.5
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) AND CARCINOGENIC PAHs						
Acenaphthene (83-32-9)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Acenaphthylene (208-96-8)	Batch/Weekly	Grab	10.5 [a]	625.1	3.5	10.5
Benzo(a)anthracene (56-55-3)	Batch/Weekly	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(a)pyrene (50-32-8)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(b)fluoranthene (205-99-2)	Batch/Weekly	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(g,h,i)perylene (191-24-2)	Batch/Weekly	Grab	12.3 [a]	610/625.1	4.1	12.3
Benzo(j)fluoranthene (205-82-3)	Batch/Weekly	Grab	1.0 [a]	625	0.5	1.0
Benzo(k)fluoranthene (207-08-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Fluoranthene (206-44-0)	Batch/Weekly	Grab	6.6 [a]	625.1	2.2	6.6
Fluorene (86-73-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Indeno(1,2,3-cd)pyrene (193-39-5)	Batch/Weekly	Grab	11.1 [a]	610/625.1	3.7	11.1
1-Methylnaphthalene (90-12-0)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
2-Methylnaphthalene (91-57-6)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
Naphthalene (91-20-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/Weekly	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
VOLATILE ORGANIC COMPOUNDS (VOC), SEMI-VOCs AND HALOGENATED VOCs						
Acetone (67-64-1)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
Benzoic Acid (65-85-0)	Batch/Weekly	Grab	50 [a]	8270	10	50
2-Butanone (MEK) (78-93-3)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
n-Butylbenzene (104-51-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
sec-Butylbenzene (135-98-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Butylbenzylphthalate (85-68-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Carbazole (86-74-8)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Carbon Disulfide (75-15-0)	Batch/Weekly	Grab	10.0 [a]	624.1/8260	10	10
Chlorobenzene (108-90-7)	Batch/Weekly	Grab	18.0 [a]	624.1	6.0	18.0
Chloroethane (75-00-3)	Batch/Weekly	Grab	2 [a]	624.1/601	1	2
Chloroform (67-66-3)	Batch/Weekly	Grab	4.8 [a]	624.1 or SM6210B	1.6	4.8
Dibenzofuran (132-64-9)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Diethylphthalate (84-66-2)	Batch/Weekly	Grab	1.9 [a]	625.1	1.9	5.7
1,2-Dichlorobenzene (95-50-1)	Batch/Weekly	Grab	7.6 [a]	624.1	1.9	7.6
1,4-Dichlorobenzene (106-46-7)	Batch/Weekly	Grab	17.6 [a]	624.1	4.4	17.6
Cis-1,2-Dichloroethene (156-59-2)	Batch/Weekly	Grab	4.8 [a]	624.1	1.6	4.8

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
2,4-Dimethylphenol (105-67-9)	Batch/Weekly	Grab	8.1[a]	625.1	2.7	8.1
bis(2-ethylhexyl)phthalate (117-81-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Isopropylbenzene (98-82-8)	Batch/Weekly	Grab	1.0 [a]	624/8260	1.0	1.0
2-Methylphenol (o-Cresol) (95-48-7)	Batch/Weekly	Grab	10 [a]	625.1	3.5	10
(3+4) Methyphenol (m,p-cresol) (65794-96-9)	Batch/Weekly	Grab	20 [a]	625.1/8270E	7	20
4-methylphenol (p-cresol) (106-44-5)	Batch/Weekly	Grab	10.0 [a]	8270	10	10
4-Methyl-2-pentanone (MIBK) (108-10-1)	Batch/Weekly	Grab	5.0 [a]	624.1	1.9	5.0
N-Nitrosodiphenylamine (86-30-6)	Batch/Weekly	Grab	2.0 [a]	625.1	1.0	2.0
Pentachlorophenol (87-86-5)	Batch/Weekly	Grab	13 [e]	625.1	3.6	10.8
Phenol (108-95-2)	Batch/Weekly	Grab	4.5 [a]	625.1	1.5	4.5
n-propylbenzene (103-65-1)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Tetrachloroethylene (127-18-4)	Batch/Weekly	Grab	12.3 [a]	624.1	4.1	12.3
2,3,4,6-Tetrachlorophenol (58-90-2)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.38	2.5
2,4,5-Trichlorophenol (95-95-4)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.57	2.5
1,2,4 –Trimethylbenzene (95-63-6)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
1,3,5 –Trimethylbenzene (108-67-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
POLYCHLORINATED BIPHENYLS (PCBs)						
PCBs, Total [j]	Batch/Weekly	Grab	10.0 [e]	608.3	0.065	0.195
PESTICIDES						
Alpha-BHC (319-84-6)	Batch/Weekly	Grab	0.009 [a]	608.3	0.003	0.009
4,4'-DDD (72-54-8)	Batch/Weekly	Grab	1.10 [l]	608.3	0.011	0.033
4,4'-DDE (72-55-9)	Batch/Weekly	Grab	1.10 [l]	608.3	0.004	0.012
4,4'-DDT (50-29-3)	Batch/Weekly	Grab	130 ng/L [e]	608.3	12 ng/L	36 ng/L
Aldrin (309-00-2)	Batch/Weekly	Grab	12 ng/L [a, k]	608.3	4.0 ng/L	12 ng/L
Carbaryl (63-25-2)	Batch/Weekly	Grab	1.6 [m]	EPA 531.1	1.5	6.5
Delta-BHC (319-86-8)	Batch/Weekly	Grab	27 ng/L [a]	608.3	9.0 ng/L	27 ng/L
Dieldrin (60-57-1)	Batch/Weekly	Grab	0.71 [e]	608.3	0.002	0.006
Endosulfan II (33213-65-9)	Batch/Weekly	Grab	0.034 [m]	608.3	4.0 ng/L	12 ng/L
Gamma-Chlordane (5103-74-2)	Batch/Weekly	Grab	42 ng/L [a]	608.3	14 ng/L	42 ng/L
Endosulfan sulfate (1031-07-8)	Batch/Weekly	Grab	198 ng/L [a]	608.3	66 ng/L	198 ng/L
Endrin Aldehyde (7421-93-4)	Batch/Weekly	Grab	70 ng/L [a]	608.3	23 ng/L	70 ng/L
Methoxychlor (72-43-5)	Batch/Weekly	Grab	0.03 [n]	608.3	0.007	0.02
DIOXIN/FURAN CONGENERS						
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin (HxCDD) (57653-85-7)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.43 pg/L	50 pg/L
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin (HxCDD) (19408-74-3)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.29 pg/L	50 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin (HpCDD) (35822-46-9)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	0.982 pg/L	50 pg/L

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (3268-87-9)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	3.14 pg/L	100 pg/L
2,3,7,8-Tetrachlorodibenzofuran (TCDF) (51207-31-9)	Batch/Weekly	Grab	5.0 pg/L [a]	1613/8290A	1.3 pg/L	5.0 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (67562-39-4)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.28 pg/L	50 pg/L
Octachlorodibenzofuran (OCDF) (39001-02-0)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	2.59 pg/L	100 pg/L

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency***	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly	Grab	25 NTU	SM2130 [o]
pH	Batch/Weekly	Grab	6.5 - 8.5 SU	SM4500-H^+ B

NOTES	
a	No applicable surface water criterion, value is laboratory quantitation level.
b	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile (“diesel”) for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
c	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.
d	Acute Freshwater Criteria from “Final Aquatic Life Ambient Water Quality Criteria for Aluminum, Table K-1”; United States Environmental Protection Agency; December 2018. Based on pH 7.0 and Total Hardness of 50 mg/L.
e	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
f	Applicable surface water criterion does not exist for barium. The indicator level of 1,000 µg/L for barium is based on groundwater quality standards to be protective of human health and the environment.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
g	Indicator Level total chromium is actually for hexavalent chromium using Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) because there is no water quality standard for total chromium.					
h	Organoleptic Effect Criteria, National Recommended Water Quality Criteria, United States Environmental Protection Agency.					
i	The human health criteria for consumption of water+ organism from National Recommended Water Quality Criteria - Human Health Criteria Table (1993)/ Criteria for domestic water supply from the Quality Criteria for Water, 1986 ("Gold Book").					
j	Total PCBs are the sum of all congener or all isomer or homolog or Aroclor analyses. Value is the Lowest Level of Quantitation (LLOQ) for water samples for PCBs by EPA Method 8082A, Update V.					
l	Acute – Freshwater Toxic Substances Criteria (WAC 173-201A-240).					
k	Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.					
m	Acute Aquatic Life Criteria-Saltwater from EPA National Recommended WQ Criteria (2012).					
n	Chronic Aquatic Life Criteria -Saltwater from Toxic Substances Criteria (WAC 173-201A-240) 2016.					
o	Or equivalent.					
*	If permission granted for flow-through, sampling will then be weekly.					

2. Failure to Comply With This Order

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

3. Your Right to Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt. The appeal process is governed by RCW 43.21B and WAC 371-08. “Date of receipt” is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within 30 days of the date of receipt of this Order:

- File your notice of appeal and a copy of this Order with the PCHB (see filing information below). “Filing” means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. “Notice of appeal” is defined in WAC 371-08-340.
- Serve a copy of your notice of appeal and this Order on the Department of Ecology mail, in person, or by email (see addresses below).

You must also comply with other applicable requirements in RCW 43.21B and WAC 371-08.

Filing with the PCHB

For the most current information regarding filing with the PCHB, visit: https://eluho.wa.gov/ or call: 360-664-9160.

Service on Ecology

Street Address:
Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:
ecologyappeals@ecy.wa.gov

4. Contact Information

Please direct all questions about this Administrative Order to:

Sylvia Graham
Department of Ecology
Northwest Region Office
P.O. Box 330316
Shoreline, WA 98133-9716

Phone: (360) 927-4900
Email: sylvia.graham@ecy.wa.gov

5. More Information

- **Pollution Control Hearings Board Website:**
  https://www.eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental and Land Use Hearings Office – Pollution Control Hearings Board:**
  https://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure**
  https://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  https://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules, & Rulemaking Website**
  https://ecology.wa.gov/Footer/rulemaking

6. Signature

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

March 31, 2025

Date

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

April 30, 2025

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Re: Amended Administrative Order

Amended Order Docket #	23633
Original Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill
	9663 March's Point Rd
	Anacortes, WA 98221

Dear Margo Gillaspy:

The Department of Ecology (Ecology) is issuing the enclosed Administrative Order (Order) requiring Skagit County Public Works to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

If you have questions, please contact Sylvia Graham at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Sincerely,

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

Enclosure: Amended Order Docket #23633

By Certified Mail #9171 9690 0935 0233 1454 45

ecc: Koorus Tahghighi, WSP USA Environment & Infrastructure Inc., koorus.tahghighi@wsp.com
David Horne, Ecology Toxics Cleanup Program, hoda461@ecy.wa.gov
PARIS Permit No. WAR313996

State of Washington
Department of Ecology

In the Matter of an Amended Administrative Order Against Skagit County Public Works Margo Gillaspy Amended Administrative Order #23633 Administrative Order Docket #23530

To: Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Amended Order Docket #	23633
Original Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill
	9663 March's Point Rd
	Anacortes, WA 98221

The Department of Ecology (Ecology) has issued this Amended Administrative Order (Order) Docket #23633 to amend Order Docket #23530, dated March 31, 2025, issued to Skagit County Public Works:

This Order describes the corrective actions required at the location known as March Point (Whitmarsh) Landfill, located at 9663 March's Point Rd, Anacortes, WA 98221.

1. Order to Comply

Background and associated corrective actions are described in full in the original Administrative Order #23530.

Skagit County Public Works submitted additional information to Ecology regarding the inability to meet certain laboratory analysis required in Table 1 of Order #23530. After reviewing the laboratory analysis provided by their lab, Ecology has revised Table 1 to reflect available options. Table 1 below includes new Indicator Levels, Detection Limits, and Quantitation Levels for certain analytes, and removal of three analytes: carbaryl, 4-methylphenol, and benzo(j)fluoranthene. All other corrective actions and monitoring requirements from Order #23530 are unchanged and remain in effect.

Table 1 from Administrative Order #23530, effective March 31, 2025, is fully replaced by the Table 1 below. No other condition or requirement of Order #23530, including the monitoring requirements, is hereby affected by this amendment.

Table 1. Marine/Brackish Water Parameters

Skagit County Public Works must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Skagit County Public Works uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
PETROLEUM HYDROCARBONS						
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/Weekly	Grab	2.0 [a]	SW 846 8021/ 8260	1.0	2.0
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/Weekly	Grab	250 [a]	NWTPH-Gx	250	250
METALS						
Aluminum, Total (7429-90-5)	Batch/Weekly	Grab	240 [d]	200.8	19.3	100
Arsenic, Total (7440-38-2)	Batch/Weekly	Grab	69 [e]	200.8	0.153	1.0
Barium, Total (7440-39-3)	Batch/Weekly	Grab	1,000 [f]	200.8	0.369	5.0
Beryllium, Total (7440-41-7)	Batch/Weekly	Grab	1 [a]	200.8	0.213	1.0
Cadmium, Total (7440-43-9)	Batch/Weekly	Grab	42.25 [e]	200.8	0.05	0.25
Chromium, Total (7440-47-3)	Batch/Weekly	Grab	1100 [g]	200.8	5.6	20.0
Copper, Total (7440-50-8)	Batch/Weekly	Grab	5.78 [e]	200.8	0.4	2.0
Iron, Total (7439-89-6)	Batch/Weekly	Grab	300 [h]	200.7	12.5	50
Lead, Total (7439-92-1)	Batch/Weekly	Grab	220.82 [e]	200.8	0.212	2.0
Manganese, total (7439-96-5)	Batch/Weekly	Grab	100 [i]	200.8	0.378	5.0
Mercury, Total (7439-97-6)	Batch/Weekly	Grab	2118 ng/L [e]	1631E	0.2 ng/L	0.5 ng/L
Molybdenum, total (7439-98-7)	Batch/Weekly	Grab	5.0 [a]	200.8	0.351	5.0
Nickel, Total (7440-02-0)	Batch/Weekly	Grab	74.75 [e]	200.8	0.165	2.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Selenium, Total (7782-49-2)	Batch/Weekly	Grab	290.58 [e]	200.8	1.0	1.0
Silver, Total (7440-22-4)	Batch/Weekly	Grab	2.24 [e]	200.8	0.119	1.0
Strontium (7440-24-6)	Batch/Weekly	Grab	10.0 [a]	200.7	1.1	10.0
Thallium, Total (7440-28-0)	Batch/Weekly	Grab	1.0 [a]	200.8	0.195	1.0
Titanium (7440-32-6)	Batch/Weekly	Grab	10.0 [a]	200.8	1.33	10.0
Vanadium (7440-62-2)	Batch/Weekly	Grab	12.5 [a]	200.8	0.408	5.0
Zinc, Total (7440-66-6)	Batch/Weekly	Grab	95.14 [e]	200.8	2.19	20.0
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) AND CARCINOGENIC PAHs						
Acenaphthene (83-32-9)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Acenaphthylene (208-96-8)	Batch/Weekly	Grab	10.5 [a]	625.1	3.5	10.5
Benzo(a)anthracene (56-55-3)	Batch/Weekly	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(a)pyrene (50-32-8)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(b)fluoranthene (205-99-2)	Batch/Weekly	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(g,h,i)perylene (191-24-2)	Batch/Weekly	Grab	12.3 [a]	610/625.1	4.1	12.3
Benzo(k)fluoranthene (207-08-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Fluoranthene (206-44-0)	Batch/Weekly	Grab	6.6 [a]	625.1	2.2	6.6
Fluorene (86-73-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Indeno(1,2,3-cd)pyrene (193-39-5)	Batch/Weekly	Grab	11.1 [a]	610/625.1	3.7	11.1
1-Methylnaphthalene (90-12-0)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
2-Methylnaphthalene (91-57-6)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
Naphthalene (91-20-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/Weekly	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
VOLATILE ORGANIC COMPOUNDS (VOC), SEMI-VOCs AND HALOGENATED VOCs						
Acetone (67-64-1)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Benzoic Acid (65-85-0)	Batch/Weekly	Grab	50 [a]	8270	10	50
2-Butanone (MEK) (78-93-3)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
n-Butylbenzene (104-51-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
sec-Butylbenzene (135-98-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Butylbenzylphthalate (85-68-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Carbazole (86-74-8)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Carbon Disulfide (75-15-0)	Batch/Weekly	Grab	10.0 [a]	624.1/8260	10	10
Chlorobenzene (108-90-7)	Batch/Weekly	Grab	18.0 [a]	624.1	6.0	18.0
Chloroethane (75-00-3)	Batch/Weekly	Grab	2 [a]	624.1/601	1	2
Chloroform (67-66-3)	Batch/Weekly	Grab	4.8 [a]	624.1 or SM6210B	1.6	4.8
Dibenzofuran (132-64-9)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Diethylphthalate (84-66-2)	Batch/Weekly	Grab	1.9 [a]	625.1	1.9	5.7
1,2-Dichlorobenzene (95-50-1)	Batch/Weekly	Grab	7.6 [a]	624.1	1.9	7.6
1,4-Dichlorobenzene (106-46-7)	Batch/Weekly	Grab	17.6 [a]	624.1	4.4	17.6
Cis-1,2-Dichloroethene (156-59-2)	Batch/Weekly	Grab	4.8 [a]	624.1	1.6	4.8
2,4-Dimethylphenol (105-67-9)	Batch/Weekly	Grab	8.1 [a]	625.1	2.7	8.1
bis(2-ethylhexyl)phthalate (117-81-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Isopropylbenzene (98-82-8)	Batch/Weekly	Grab	1.0 [a]	624/8260	1.0	1.0
2-Methylphenol (o-Cresol) (95-48-7)	Batch/Weekly	Grab	10 [a]	625.1	3.5	10
(3+4) Methyphenol (m,p-cresol) (65794-96-9)	Batch/Weekly	Grab	20 [a]	625.1/8270E	7	20
4-Methyl-2-pentanone (MIBK) (108-10-1)	Batch/Weekly	Grab	5.0 [a]	624.1	1.9	5.0
N-Nitrosodiphenylamine (86-30-6)	Batch/Weekly	Grab	2.0 [a]	625.1	1.0	2.0
Pentachlorophenol (87-86-5)	Batch/Weekly	Grab	13 [e]	625.1	3.6	10.8
Phenol (108-95-2)	Batch/Weekly	Grab	4.5 [a]	625.1	1.5	4.5

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
n-propylbenzene (103-65-1)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Tetrachloroethylene (127-18-4)	Batch/Weekly	Grab	12.3 [a]	624.1	4.1	12.3
2,3,4,6-Tetrachlorophenol (58-90-2)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.38	2.5
2,4,5-Trichlorophenol (95-95-4)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.57	2.5
1,2,4 –Trimethylbenzene (95-63-6)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
1,3,5 –Trimethylbenzene (108-67-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
POLYCHLORINATED BIPHENYLS (PCBs)						
PCBs, Total [j]	Batch/Weekly	Grab	10.0 [e]	608.3	0.192	0.5
PESTICIDES						
Alpha-BHC (319-84-6)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0277	0.05
4,4'-DDD (72-54-8)	Batch/Weekly	Grab	1.10 [l]	608.3	0.011	0.033
4,4'-DDE (72-55-9)	Batch/Weekly	Grab	1.10 [l]	608.3	0.004	0.012
4,4'-DDT (50-29-3)	Batch/Weekly	Grab	130 ng/L [e]	608.3	0.0211	0.05
Aldrin (309-00-2)	Batch/Weekly	Grab	0.71 [k]	608.3	0.0249	0.05
Delta-BHC (319-86-8)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0403	0.05
Dieldrin (60-57-1)	Batch/Weekly	Grab	0.71 [e]	608.3	0.0298	0.05
Endosulfan II (33213-65-9)	Batch/Weekly	Grab	0.05 [m]	608.3	0.0311	0.05
Gamma-Chlordane (5103-74-2)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0137	0.05
Endosulfan sulfate (1031-07-8)	Batch/Weekly	Grab	198 ng/L [a]	608.3	0.0306	0.05
Endrin Aldehyde (7421-93-4)	Batch/Weekly	Grab	70 ng/L [a]	608.3	0.0358	0.05
Methoxychlor (72-43-5)	Batch/Weekly	Grab	0.05 [n]	608.3	0.04	0.05
DIOXIN/FURAN CONGENERS						
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin (HxCDD) (57653-85-7)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.43 pg/L	50 pg/L
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin (HxCDD) (19408-74-3)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.29 pg/L	50 pg/L

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin (HpCDD) (35822-46-9)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	0.982 pg/L	50 pg/L
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (3268-87-9)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	3.14 pg/L	100 pg/L
2,3,7,8-Tetrachlorodibenzofuran (TCDF) (51207-31-9)	Batch/Weekly	Grab	5.0 pg/L [a]	1613/8290A	1.3 pg/L	5.0 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (67562-39-4)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.28 pg/L	50 pg/L
Octachlorodibenzofuran (OCDF) (39001-02-0)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	2.59 pg/L	100 pg/L

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency***	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly	Grab	25 NTU	SM2130 [o]
pH	Batch/Weekly	Grab	6.5 - 8.5 SU	SM4500-H^+ B

NOTES	
a	No applicable surface water criterion, value is laboratory quantitation level.
b	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile (“diesel”) for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
c	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.
d	Acute Freshwater Criteria from “Final Aquatic Life Ambient Water Quality Criteria for Aluminum, Table K-1”; United States Environmental Protection Agency; December 2018. Based on pH 7.0 and Total Hardness of 50 mg/L.
e	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
f	Applicable surface water criterion does not exist for barium. The indicator level of 1,000 µg/L for barium is based on groundwater quality standards to be protective of human health and the environment.
g	Indicator Level total chromium is actually for hexavalent chromium using Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) because there is no water quality standard for total chromium.
h	Organoleptic Effect Criteria, National Recommended Water Quality Criteria, United States Environmental Protection Agency.
i	The human health criteria for consumption of water+ organism from National Recommended Water Quality Criteria - Human Health Criteria Table (1993)/ Criteria for domestic water supply from the Quality Criteria for Water, 1986 ("Gold Book").
j	Total PCBs are the sum of all congener or all isomer or homolog or Aroclor analyses.
l	Acute – Freshwater Toxic Substances Criteria (WAC 173-201A-240).
k	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) 2016. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.
m	Acute Aquatic Life Criteria-Saltwater from EPA National Recommended WQ Criteria (2012).
n	Chronic Aquatic Life Criteria -Saltwater from Toxic Substances Criteria (WAC 173-201A-240) 2016.
o	Or equivalent.
*	If permission granted for flow-through, sampling will then be weekly.

2. Failure to Comply With This Order

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

3. Your Right to Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within thirty (30) days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within thirty (30) days of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see address below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology by mail or in person or by email (see addresses below).

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Filing with the PCHB

For the most current information regarding filing with the PCHB, visit: https://eluho.wa.gov/ or call: 360-664-9160.

Service on Ecology

Street Address:
Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:
ecologyappeals@ecy.wa.gov

4. Contact Information

Please direct all questions about this Amended Administrative Order to:

Sylvia Graham
Department of Ecology
Bellingham Field Office
913 Squalicum Way #101
Bellingham, WA 98225-2078

Phone: (360) 927-4900
Email: sylvia.graham@ecy.wa.gov

5. More Information

- **Pollution Control Hearings Board Website:**
  https://www.eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental and Land Use Hearings Office – Pollution Control Hearings Board:**
  https://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure**
  https://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  https://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules, & Rulemaking Website**
  https://ecology.wa.gov/Footer/rulemaking

6. Signature

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

April 30, 2025

Date

WAC 173-240-130

Engineering report.

(1) The engineering report for an industrial wastewater facility must be sufficiently complete so that plans and specifications can be developed from it without substantial changes. Two copies of the report must be submitted to the department for approval.

(2) The engineering report shall include the following information together with any other relevant data as requested by the department:

(a) Type of industry or business;

(b) The kind and quantity of finished product;

(c) The quantity and quality of water used by the industry and a description of how it is consumed or disposed of, including:

(i) The quantity and quality of all process wastewater and method of disposal;

(ii) The quantity of domestic wastewater and how it is disposed of;

(iii) The quantity and quality of noncontact cooling water (including air conditioning) and how it is disposed of; and

(iv) The quantity of water consumed or lost to evaporation.

(d) The amount and kind of chemicals used in the treatment process, if any;

(e) The basic design data and sizing calculations of the treatment units;

(f) A discussion of the suitability of the proposed site for the facility;

(g) A description of the treatment process and operation, including a flow diagram;

(h) All necessary maps and layout sketches;

(i) Provisions for bypass, if any;

(j) Physical provision for oil and hazardous material spill control or accidental discharge prevention or both;

(k) Results to be expected from the treatment process including the predicted wastewater characteristics, as shown in the waste discharge permit, where applicable;

(l) A description of the receiving water, location of the point of discharge, applicable water quality standards, and how water quality standards will be met outside of any applicable dilution zone;

(m) Detailed outfall analysis;

(n) The relationship to existing treatment facilities, if any;

(o) Where discharge is to a municipal sewerage system, a discussion of that system's ability to transport and treat the proposed industrial waste discharge without exceeding the municipality's allocated industrial capacity. Also, a discussion on the effects of the proposed industrial discharge on the use or disposal of municipal sludge;

(p) Where discharge is through land application, including seepage lagoons, irrigation, and subsurface disposal, a geohydrologic evaluation of factors such as:

(i) Depth to groundwater and groundwater movement during different times of the year;

(ii) Water balance analysis of the proposed discharge area;

(iii) Overall effects of the proposed facility upon the groundwater in conjunction with any other land application facilities that may be present;

(q) A statement expressing sound engineering justification through the use of pilot plant data, results from other similar installations, or scientific evidence from the literature, or both, that the effluent from the proposed facility will meet applicable permit effluent limitations or pretreatment standards or both;

(r) A discussion of the method of final sludge disposal selected and any alternatives considered with reasons for rejection;

(s) A statement regarding who will own, operate, and maintain the system after construction;

(t) A statement regarding compliance with any state or local water quality management plan or any plan adopted under the Federal Water Pollution Control Act as amended;

(u) Provisions for any committed future plans;

(v) A discussion of the various alternatives evaluated, if any, and reasons they are unacceptable;

(w) A timetable for final design and construction;

(x) A statement regarding compliance with the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA), if applicable;

(y) Additional items to be included in an engineering report for a solid waste leachate treatment system are:

(i) A vicinity map and also a site map that shows topography, location of utilities, and location of the leachate collection network, treatment systems, and disposal;

(ii) Discussion of the solid waste site, working areas, soil profile, rainfall data, and groundwater movement and usage;

(iii) A statement of the capital costs and the annual operation and maintenance costs;

(iv) A description of all sources of water supply within two thousand feet of the proposed disposal site. Particular attention should be given to showing impact on usable or potentially usable aquifers.

[Statutory Authority: RCW **90.48.110**. WSR 00-15-021 (Order 00-09), § 173-240-130, filed 7/11/00, effective 8/11/00. Statutory Authority: Chapters **43.21A** and **90.48** RCW. WSR 83-23-063 (Order DE 83-30), § 173-240-130, filed 11/16/83. Statutory Authority: RCW **90.48.110**. WSR 79-02-033 (Order DE 78-10), § 173-240-130, filed 1/23/79. Formerly chapter 372-20 WAC.]

APPENDIX B

TECHNICAL INFORMATION

TABLE B-1: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Dissolved Metals (µg/L)																			
Arsenic	0.20	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**3.5**	**3.7**	**3.5**	**7.3**	3.0 U	3.0 U
Barium	NA	**47**	**73**	**57**	**36**	**150**	**140**	**190**	**190**	25 U	25 U	**68**	**52**	25 U	25 U	25 U	25 U	25 U	**44**
Cadmium	NA	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Chromium	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	1,000	**430**	**4,800**	**62,000**	**32,000**	**800**	**2,200**	**540**	**620**	**4,400**	**2,700**	**570**	**930 J**	56 U	56 U	56 U	**330**	56 U	**540 J**
Lead	2.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Mercury	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	1.9	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (µg/L)																			
Arsenic	0.20	3.3 U	**6.0**	3.3 U	3.3 U	3.3 U	3.3 U	**6.1**	3.3 U	**5.6**	3.3 U	**4.2**	3.3 U	**4.1**	**4.1**	**3.8**	**8.6**	3.3 U	3.3 U
Barium	NA	**83**	**110**	**96**	**93**	**250**	**250**	**270**	**290**	**64**	**31**	**150**	**120**	28 U	28 U	28 U	**29**	28 U	**130**
Cadmium	NA	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
Chromium	NA	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	**12**	11 U	11 U
Iron	1,000	**12,000**	**17,000**	**85,000**	**79,000**	**20,000**	**22,000**	**17,000**	**14,000**	**16,000**	**9,000**	**17,000**	**17,000**	**900 J**	56 U	**630 J**	**4,600**	56 U	**16,000**
Lead	2.5	**6.5**	1.1 U	**2.8**	1.1 U	**5.0**	1.1 U	**9.4**	1.1 U	**42**	**2.1**	**16**	1.1 U	1.1 U	1.1 U	1.1 U	**1.4**	1.1 U	1.1 U
Mercury	0.20	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	NA	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
Silver	1.9	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
PCBs (µg/L)																			
PCB-aroclor 1016	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1221	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1232	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1242	0.014	0.050 U	0.053 U	**0.057**	**0.11**	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1248	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	5.0 UJ	5.6 UJ	4.8 UJ	4.9 UJ	5.0 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1254	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	0.56 UJ	0.96 UJ	0.49 UJ	0.25 UJ	0.52 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.53 UJ
PCB-aroclor 1260	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 UJ	0.056 U	0.048 UJ	0.049 U	0.050 UJ	0.052 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.053 U
Pesticides (µg/L)																			
4,4'-DDD	0.0013	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.59**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
4,4'-DDE	0.0013	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	**0.0073**	**0.23 J**	**0.20**	**0.70**	**0.49 J**	**0.32 J**	**0.67 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.68 J**
4,4'-DDT	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.01 J**	**0.014 J**	0.048 U	**0.38**	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.17 J**
Aldrin	NA	0.0020 U	0.0021 U	0.0020 U	0.0021 U	0.0020 U	0.0020 U	**0.33 J**	**0.43 J**	**0.22 J**	**0.68 J**	**3.2 J**	**2.1 J**	**0.0022 J**	**0.0028**	0.0020 U	0.0020 U	0.0020 U	**2.5 J**
alpha-BHC	0.00060	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.0073**	0.048 U	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
alpha-Chlordane	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.28 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
beta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.058**	0.049 U	**0.10 J**	0.10 U	0.0053 U	**0.0061 J**	0.0051 U	0.0050 U	0.0049 U	0.11 U
delta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.0061 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.067**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Dieldrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.086 J**	**0.086 J**	0.050 U	**0.22 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.26 J**
Endosulfan I	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.052 J**	0.0056 U	**0.21 J**	0.049 U	**0.44 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Endosulfan II	NA	0.0050 U	**0.0058**	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.048**	**0.048 J**	**0.83**	**0.27 J**	0.050 U	**0.27 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.23 J**
Endosulfan Sulfate	NA	0.0050 U	0.0053 U	0.0050 U	**0.0074 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.060 J**	**0.12**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.13 J**
Endrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.061 J**	0.048 U	**0.34 J**	0.050 U	**0.61**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.63**
Endrin Aldehyde	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.011**	**0.19 J**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.11 J**
Endrin Ketone	NA	0.020 U	0.021 U	0.020 U	0.021 U	0.020 U	0.020 U	0.020 U	0.022 U	0.19 U	0.20 U	0.20 U	0.41 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.42 U
gamma-BHC (Lindane)	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.056**	0.049 U	**0.069 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
gamma-Chlordane	NA	0.0050 U	0.0053 U	**0.011**	**0.012**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**1.1 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.054 J**	1.0 UJ	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor Epoxide	NA	0.0030 U	0.0032 U	0.0030 U	0.0032 U	0.0031 U	0.0030 U	0.0030 U	**0.089 J**	**0.14 J**	**0.093 J**	**0.37 J**	**0.29 J**	0.0032 U	0.0030 U	0.0030 U	0.0030 U	0.0029 U	**0.34 J**
Methoxychlor	NA	0.0099 U	0.011 U	0.0099 U	0.011 U	0.01 U	0.01 U	**0.014 J**	0.011 U	0.097 U	**0.11 J**	0.10 U	0.21 U	0.011 U	0.0099 U	0.01 U	0.01 U	0.0098 U	0.21 U
Toxaphene	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 U	0.056 U	0.48 U	0.49 U	0.50 U	1.0 U	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	1.1 U

TABLE B-1: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Semivolatile Organic Compounds (µg/L)																			
(3+4)-Methylphenol (m,p-Cresol)	NA	1.0 U	1.0 U	0.98 U	**1.0**	**1.5**	0.99 U	1.0 U	1.0 U	**11**	**28**	**1,700**	**56**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**70**
1,2,4-Trichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Diphenylhydrazine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dichlorobenzene	NA	1.0 U	**1.2**	**3.5**	**3.1**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1-Methylnaphthalene	1.51	--	--	**10**	**9.0**	--	--	--	--	**3.4**	--	**14**	**3.5 J**	--	--	--	--	--	**5.4 J**
2,3,4,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**5.7**	1.3 UJ	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.6 UJ
2,3,5,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,3-Dichloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4,5-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.4**	**2.3**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**3.2**
2,4,6-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dimethylphenol	380	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**130**	**140**	**3,100**	**470**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**590**
2,4-Dinitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	8.0 U	5.1 U	4.8 U	4.9 U	8.1 U	5.0 U	4.8 U	5.1 U
2,4-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,6-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chloronaphthalene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Methylnaphthalene	NA	--	--	**5.6**	**4.5**	--	--	--	--	**2.6**	**1.1**	**16**	**3.7 J**	--	--	--	--	--	**6.6 J**
2-Methylphenol (o-Cresol)	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**7.2**	**20**	**1,300**	**51**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**60**
2-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Nitrophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3,3'-Dichlorobenzidine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4,6-Dinitro-2-methylphenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	7.3 U	5.1 U	4.8 U	4.9 U	7.4 U	5.0 U	4.8 U	5.1 U
4-Bromophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloro-3-methylphenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chlorophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Acenaphthene	NA	--	--	**2.1**	**1.6**	--	--	--	--	--	--	**1.0**	--	--	--	--	--	--	--
Acenaphthylene	NA	--	--	--	--	--	--	--	--	**1.4**	--	--	--	--	--	--	--	--	--
Aniline	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Benzidine	NA	5.0 U	--	4.9 U	--	5.1 U	--	5.0 U	--	5.0 U	--	5.0 U	--	4.8 U	--	5.1 U	5.0 U	--	--
Benzyl alcohol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethoxy)methane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroisopropyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Ethylhexyl)phthalate	1.2	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
bis-2-Ethylhexyladipate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Butylbenzylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Carbazole	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dibenzofuran	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Diethylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dimethylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-butylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-octylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Fluorene	NA	--	--	**1.5**	**1.0**	--	--	--	--	--	--	**1.6**	**1.0**	--	--	--	--	--	**1.3**
Hexachlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorobutadiene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorocyclopentadiene	NA	1.0 U	1.3 U	0.98 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.3 U	1.3 U	0.96 U	1.3 U	1.3 U	1.0 U	1.2 U	1.3 U
Hexachloroethane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Isophorone	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Naphthalene	NA	--	--	--	--	--	--	--	--	**1.4**	--	**19**	**4.9 J**	--	--	--	--	--	**9.5 J**
Nitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodimethylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitroso-di-n-propylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodiphenylamine	NA	1.0 U	1.0 U	1.8 UJ	**1.3**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pentachlorophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	**80**	**21 J**	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	**26**
Phenanthrene	NA	--	--	**1.4**	**1.1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	**1.8**	**7.8**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pyridine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U

TABLE B-1: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Polycyclic Aromatic Hydrocarbons (µg/L)																			
1-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	**0.23**	**0.33**	--	**0.78**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
2-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	--	--	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Acenaphthene	NA	**0.23**	**0.45**	--	--	**0.15**	**0.14**	**0.23**	**0.28**	0.21 UJ	0.097 U	--	**0.43 J**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.68 J**
Acenaphthylene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	--	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.12 UJ
Anthracene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Benz[a]anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.031**	0.015 UJ	**0.057**	0.014 UJ	0.0096 UJ	0.0098 U	**0.011 J**	**0.013**	0.0095 U	0.01 U
Benzo(a)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.028**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.012 J**	**0.014**	0.0095 U	0.01 U
Benzo(b)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.034**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.016 J**	**0.015**	0.0095 U	0.01 U
Benzo(ghi)perylene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.016**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.011 J**	0.01 U	0.0095 U	0.01 U
Benzo(j,k)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.011**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Chrysene	0.01	0.01 U	0.01 U	**0.011**	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.16**	0.0097 U	**0.057**	0.01 U	0.0096 UJ	0.0098 U	**0.021 J**	**0.015**	0.0095 U	0.01 U
Dibenzo(a,h)anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	0.01 U	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Fluoranthene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 UJ	0.19 UJ	0.62 U	0.23 UJ	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.29 UJ
Fluorene	NA	**0.27**	**0.34**	--	--	0.10 U	0.099 U	**0.14**	0.10 U	**0.31**	0.097 U	--	--	0.096 U	0.098 U	0.10 U	**0.11**	0.095 U	--
Indeno(1,2,3-cd)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.014**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Naphthalene	NA	**0.10**	0.10 U	**0.33**	**0.22**	0.10 U	0.099 U	0.10 U	0.10 U	--	**0.69**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Phenanthrene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	**0.25**	0.097 U	0.50 U	**0.33**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.35**
Pyrene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Total cPAHs TEQ	NA	0.00755	0.00755	**0.00801**	0.00755	0.00755	0.00747	0.00755	0.00755	**0.0550**	0.00997	**0.0730**	0.00955	0.00725	0.00740	**0.0170**	**0.0185**	0.00717	0.00755
Volatile Organic Compounds (µg/L)																			
Benzene	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.3**	**7.8**	**4.3**	1.0 U	4.0 U	**18**	**8.6 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**14 J**
Miscellaneous																			
Conductivity (µmhos/cm)	NA	--	**2,000**	--	**590**	--	**610**	--	**630**	--	**330**	--	**510**	--	**520**	--	--	**540**	**520**
Salinity (g/kg)	NA	--	**0.95**	--	**0.27**	--	**0.28**	--	**0.29**	--	**0.15**	--	**0.24**	--	**0.24**	--	--	**0.25**	**0.24**
pH (SU)	NA	**6.9**	**6.6**	**8.6**	**6.4**	**7.2**	**6.9**	**7.0**	**7.2**	**6.5**	**6.6**	**7.1**	**7.1**	**7.0**	**6.8**	**6.9**	**6.5**	**8.2**	**7.1**

Notes
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = Reported value is an estimate.
   UJ = The analyte was not detected at the estimated reporting limit indicated.
2. **Bolded** values are detections, yellow highlighted cells are PQLs exceedances

Abbreviations
-- = analyte was not detected
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter
BHC = benzene hexachloride
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
DUP = duplicate
g/kg = grams per kilogram
NA = not available
PCBs = polychlorinated biphenyls
PCL = practical quantitation limit
SU = standard units
TEQ = toxic equivalency quotient

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

November 18, 2021

Koorus Tahghighi
Wood Environment and Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA 98101

Re: Analytical Data for Project Whitmarsh Landfill
Laboratory Reference No. 2110-289

Dear Koorus:

Enclosed are the analytical results and associated quality control data for samples submitted on October 29, 2021.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

Case Narrative

Samples were collected on October 27 and 28, 2021 and received by the laboratory on October 29, 2021. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Total Lead EPA 6010D Analysis

Sample MW-21-1-102721 (10-289-01) was the quality control sample instead of sample MW-21-1-102821 (10-289-08) because of insufficient sample remaining for digestion.

Any other QA/QC issues associated with this extraction and analysis will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**0.10**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.27**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*34*	*10 - 82*				
Phenol-d6	*27*	*10 - 92*				
Nitrobenzene-d5	*53*	*32 - 105*				
2-Fluorobiphenyl	*65*	*38 - 105*				
2,4,6-Tribromophenol	*86*	*25 - 124*				
Terphenyl-d14	*73*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
n-Nitrosodimethylamine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**3.5**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**0.33**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**5.6**	0.98	EPA 8270E	11-2-21	11-3-21	
1-Methylnaphthalene	**10**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorocyclopentadiene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**2.1**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Nitrophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Fluorene	**1.5**	0.98	EPA 8270E	11-2-21	11-3-21	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.8	EPA 8270E	11-2-21	11-3-21	U1
1,2-Diphenylhydrazine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**1.4**	0.98	EPA 8270E	11-2-21	11-3-21	
Anthracene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.098	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.011**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	0.98	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.0098	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*31*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*71*	*38 - 105*				
2,4,6-Tribromophenol	*92*	*25 - 124*				
Terphenyl-d14	*81*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.11**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.013**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.015**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.015**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.014**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*29*	*10 - 92*				
Nitrobenzene-d5	*60*	*32 - 105*				
2-Fluorobiphenyl	*64*	*38 - 105*				
2,4,6-Tribromophenol	*86*	*25 - 124*				
Terphenyl-d14	*60*	*42 - 116*				

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**1.5**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.15**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*40*	*10 - 82*				
Phenol-d6	*30*	*10 - 92*				
Nitrobenzene-d5	*63*	*32 - 105*				
2-Fluorobiphenyl	*68*	*38 - 105*				
2,4,6-Tribromophenol	*89*	*25 - 124*				
Terphenyl-d14	*73*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**0.23**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.14**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*37*	*10 - 82*				
Phenol-d6	*29*	*10 - 92*				
Nitrobenzene-d5	*64*	*32 - 105*				
2-Fluorobiphenyl	*67*	*38 - 105*				
2,4,6-Tribromophenol	*88*	*25 - 124*				
Terphenyl-d14	*74*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**7.2**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**11**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**130**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**1.4**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**2.6**	1.0	EPA 8270E	11-2-21	11-3-21	
1-Methylnaphthalene	**3.4**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**1.4**	1.0	EPA 8270E	11-2-21	11-3-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.21	EPA 8270E/SIM	11-2-21	11-2-21	U1
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**0.31**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**0.25**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.031**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.16**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.034**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.028**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**0.014**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**0.016**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*31*	*10 - 82*				
Phenol-d6	*25*	*10 - 92*				
Nitrobenzene-d5	*60*	*32 - 105*				
2-Fluorobiphenyl	*60*	*38 - 105*				
2,4,6-Tribromophenol	*84*	*25 - 124*				
Terphenyl-d14	*78*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**7.8**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**1300**	100	EPA 8270E	11-2-21	11-4-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**1700**	100	EPA 8270E	11-2-21	11-4-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	13	EPA 8270E	11-2-21	11-4-21	
Isophorone	**ND**	13	EPA 8270E	11-2-21	11-4-21	
2-Nitrophenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2,4-Dimethylphenol	**3100**	200	EPA 8270E	11-2-21	11-4-21	
bis(2-Chloroethoxy)methane	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2,4-Dichlorophenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
1,2,4-Trichlorobenzene	**ND**	10	EPA 8270E	11-2-21	11-4-21	
Naphthalene	**19**	10	EPA 8270E	11-2-21	11-4-21	
4-Chloroaniline	**ND**	10	EPA 8270E	11-2-21	11-4-21	
Hexachlorobutadiene	**ND**	10	EPA 8270E	11-2-21	11-4-21	
4-Chloro-3-methylphenol	**ND**	10	EPA 8270E	11-2-21	11-4-21	
2-Methylnaphthalene	**16**	10	EPA 8270E	11-2-21	11-4-21	
1-Methylnaphthalene	**14**	10	EPA 8270E	11-2-21	11-4-21	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**2.4**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
2,4-Dinitrophenol	**ND**	8.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**1.0**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**2.0**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**5.7**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**1.6**	1.0	EPA 8270E	11-2-21	11-3-21	
4,6-Dinitro-2-methylphenol	**ND**	7.3	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**80**	50	EPA 8270E	11-2-21	11-4-21	
Phenanthrene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Anthracene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Carbazole	**2.0**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.62	EPA 8270E/SIM	11-2-21	11-3-21	U1
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.50	EPA 8270E/SIM	11-2-21	11-3-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.057**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Chrysene	**0.057**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo(j,k)fluoranthene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo[a]pyrene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Dibenz[a,h]anthracene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Benzo[g,h,i]perylene	**ND**	0.050	EPA 8270E/SIM	11-2-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*41*	*10 - 82*				
Phenol-d6	*13*	*10 - 92*				
Nitrobenzene-d5	*63*	*32 - 105*				
2-Fluorobiphenyl	*65*	*38 - 105*				
2,4,6-Tribromophenol	*82*	*25 - 124*				
Terphenyl-d14	*74*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
n-Nitrosodimethylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
2,4-Dinitrophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.096	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	4.8	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	0.96	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.0096	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*34*	*10 - 82*				
Phenol-d6	*25*	*10 - 92*				
Nitrobenzene-d5	*57*	*32 - 105*				
2-Fluorobiphenyl	*60*	*38 - 105*				
2,4,6-Tribromophenol	*76*	*25 - 124*				
Terphenyl-d14	*64*	*42 - 116*				

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Aniline	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	11-2-21	11-3-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dimethylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
2,4-Dinitrophenol	**ND**	8.1	EPA 8270E	11-2-21	11-3-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	7.4	EPA 8270E	11-2-21	11-3-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Pentachlorophenol	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[a]anthracene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**0.021**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	11-2-21	11-3-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-3-21	
Benzo[b]fluoranthene	**0.016**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**0.012**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**0.011**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*43*	*10 - 82*				
Phenol-d6	*32*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*68*	*38 - 105*				
2,4,6-Tribromophenol	*60*	*25 - 124*				
Terphenyl-d14	*70*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Pyridine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Phenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Aniline	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Chlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzyl alcohol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachloroethane	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Nitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Isophorone	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Nitrophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Chloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Hexachlorocyclopentadiene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Dimethylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
3-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1102W1					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4-Nitrophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Dibenzofuran	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Diethylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Nitroaniline	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Fluorene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Pentachlorophenol	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Anthracene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Carbazole	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Benzidine	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Pyrene	**ND**	0.10	EPA 8270E/SIM	11-2-21	11-2-21	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Chrysene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	11-2-21	11-2-21	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	11-2-21	11-2-21	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	11-2-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*26*	*10 - 82*				
Phenol-d6	*22*	*10 - 92*				
Nitrobenzene-d5	*40*	*32 - 105*				
2-Fluorobiphenyl	*55*	*38 - 105*				
2,4,6-Tribromophenol	*80*	*25 - 124*				
Terphenyl-d14	*72*	*42 - 116*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Phenol	**12.9**	**14.2**	38.6	38.4	ND	33	37	20 - 108	10	24	
2-Chlorophenol	**27.7**	**29.6**	38.6	38.4	ND	72	77	24 - 105	7	32	
1,4-Dichlorobenzene	**12.1**	**12.6**	19.3	19.2	ND	63	66	24 - 100	4	36	
n-Nitroso-di-n-propylamine	**14.9**	**16.0**	19.3	19.2	ND	77	83	21 - 143	7	30	
1,2,4-Trichlorobenzene	**13.1**	**14.4**	19.3	19.2	ND	68	75	34 - 105	9	34	
4-Chloro-3-methylphenol	**30.0**	**32.1**	38.6	38.4	ND	78	84	44 - 113	7	21	
Acenaphthene	**14.6**	**15.5**	19.3	19.2	ND	76	81	47 - 106	6	19	
4-Nitrophenol	**20.7**	**22.8**	38.6	38.4	ND	54	59	20 - 127	10	37	
2,4-Dinitrotoluene	**15.6**	**16.5**	19.3	19.2	ND	81	86	45 - 106	6	19	
Pentachlorophenol	**39.4**	**44.8**	38.6	38.4	ND	102	117	20 - 136	13	39	
Pyrene	**15.6**	**16.2**	19.3	19.2	ND	81	84	47 - 112	4	23	
Surrogate:											
2-Fluorophenol						*37*	*40*	*10 - 82*			
Phenol-d6						*27*	*30*	*10 - 92*			
Nitrobenzene-d5						*60*	*66*	*32 - 105*			
2-Fluorobiphenyl						*63*	*67*	*38 - 105*			
2,4,6-Tribromophenol						*77*	*85*	*25 - 124*			
Terphenyl-d14						*65*	*67*	*42 - 116*			

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Project: Whitmarsh Landfill

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS										
Laboratory ID:	SB1102W1									
	SB	SBD	SB	SBD	SB	SBD				
Phenol	**16.1**	**16.3**	40.0	40.0	40	41	21 - 53	1	26	
2-Chlorophenol	**30.8**	**31.3**	40.0	40.0	77	78	38 - 92	2	28	
1,4-Dichlorobenzene	**14.3**	**14.0**	20.0	20.0	72	70	30 - 88	2	32	
n-Nitroso-di-n-propylamine	**16.3**	**16.2**	20.0	20.0	82	81	40 - 103	1	27	
1,2,4-Trichlorobenzene	**15.4**	**15.0**	20.0	20.0	77	75	37 - 95	3	29	
4-Chloro-3-methylphenol	**34.9**	**34.9**	40.0	40.0	87	87	50 - 101	0	17	
Acenaphthene	**16.4**	**17.0**	20.0	20.0	82	85	46 - 97	4	19	
4-Nitrophenol	**26.3**	**25.8**	40.0	40.0	66	65	23 - 64	2	34	I,I
2,4-Dinitrotoluene	**18.2**	**18.1**	20.0	20.0	91	91	46 - 100	1	17	
Pentachlorophenol	**45.6**	**46.3**	40.0	40.0	114	116	39 - 123	2	29	
Pyrene	**18.1**	**18.0**	20.0	20.0	91	90	52 - 107	1	19	
Surrogate:										
2-Fluorophenol					*46*	*45*	*10 - 82*			
Phenol-d6					*33*	*33*	*10 - 92*			
Nitrobenzene-d5					*65*	*66*	*32 - 105*			
2-Fluorobiphenyl					*67*	*68*	*38 - 105*			
2,4,6-Tribromophenol					*85*	*87*	*25 - 124*			
Terphenyl-d14					*72*	*72*	*42 - 116*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*98*	*42-140*				
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1242	**0.057**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*86*	*42-140*				
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Aroclor 1016	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*104*	*42-140*				
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Aroclor 1016	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	5.0	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*104*	*42-140*				
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Aroclor 1016	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	4.8	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.96	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.048	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Project: Whitmarsh Landfill

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Aroclor 1016	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1221	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1232	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1242	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1248	**ND**	5.0	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1254	**ND**	0.25	EPA 8082A	11-1-21	11-9-21	U1
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-9-21	U1
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*99*	*42-140*				
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Aroclor 1016	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.053	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*103*	*42-140*				
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Aroclor 1016	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1221	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1232	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1242	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1248	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1254	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Aroclor 1260	**ND**	0.051	EPA 8082A	11-1-21	11-9-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*93*	*42-140*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

PCBs EPA 8082A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*98*	*42-140*				
Laboratory ID:	MB1103W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1221	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1232	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1242	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1248	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1254	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Aroclor 1260	**ND**	0.050	EPA 8082A	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*99*	*42-140*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Aroclor 1260	**0.427**	**0.432**	0.493	0.483	ND	**87**	**89**	80-119	1	17	
Surrogate:											
DCB						*104*	*108*	*42-140*			
SPIKE BLANKS											
Laboratory ID:	SB1101W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.402**	**0.385**	0.500	0.500	N/A	**80**	**77**	73-131	4	12	
Surrogate:											
DCB						*95*	*94*	*42-140*			
Laboratory ID:	SB1103W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.489**	**0.486**	0.500	0.500	N/A	**98**	**97**	73-131	1	12	
Surrogate:											
DCB						*112*	*108*	*42-140*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.0099	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*47*	*25-114*				
DCB	*68*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-3-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-3-21	
gamma-Chlordane	**0.011**	0.0050	EPA 8081B	11-3-21	11-3-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Methoxychlor	**ND**	0.0099	EPA 8081B	11-3-21	11-3-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-3-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*47*	*25-114*				
DCB	*62*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-8-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-8-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-3-21	11-8-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-8-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-8-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*60*	*25-114*				
DCB	*59*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
alpha-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0031	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.051	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*54*	*25-114*				
DCB	*75*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**0.33**	0.020	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**0.23**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endosulfan I	**0.052**	0.0050	EPA 8081B	11-1-21	11-2-21	P
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**0.048**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**0.010**	0.0050	EPA 8081B	11-1-21	11-2-21	P
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**0.014**	0.010	EPA 8081B	11-1-21	11-2-21	P
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*52*	*25-114*				
DCB	*75*	*30-137*				

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
alpha-BHC	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
gamma-BHC (Lindane)	**0.056**	0.048	EPA 8081B	11-1-21	11-8-21	
beta-BHC	**0.058**	0.048	EPA 8081B	11-1-21	11-8-21	
delta-BHC	**0.067**	0.048	EPA 8081B	11-1-21	11-8-21	
Heptachlor	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Aldrin	**0.22**	0.019	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**0.14**	0.029	EPA 8081B	11-1-21	11-8-21	P
gamma-Chlordane	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
alpha-Chlordane	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDE	**0.70**	0.048	EPA 8081B	11-1-21	11-8-21	
Endosulfan I	**0.21**	0.048	EPA 8081B	11-1-21	11-8-21	P
Dieldrin	**0.086**	0.048	EPA 8081B	11-1-21	11-8-21	P
Endrin	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDD	**0.59**	0.048	EPA 8081B	11-1-21	11-8-21	
Endosulfan II	**0.83**	0.048	EPA 8081B	11-1-21	11-8-21	
4,4'-DDT	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Endrin Aldehyde	**0.19**	0.048	EPA 8081B	11-1-21	11-8-21	P
Methoxychlor	**ND**	0.097	EPA 8081B	11-1-21	11-8-21	
Endosulfan Sulfate	**ND**	0.048	EPA 8081B	11-1-21	11-8-21	
Endrin Ketone	**ND**	0.19	EPA 8081B	11-1-21	11-8-21	
Toxaphene	**ND**	0.48	EPA 8081B	11-1-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
alpha-BHC	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
gamma-BHC (Lindane)	**0.069**	0.050	EPA 8081B	11-1-21	11-8-21	P
beta-BHC	**0.10**	0.050	EPA 8081B	11-1-21	11-8-21	P
delta-BHC	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Heptachlor	**0.054**	0.050	EPA 8081B	11-1-21	11-8-21	P
Aldrin	**3.2**	0.020	EPA 8081B	11-1-21	11-8-21	P
Heptachlor Epoxide	**0.37**	0.030	EPA 8081B	11-1-21	11-8-21	P
gamma-Chlordane	**1.1**	0.050	EPA 8081B	11-1-21	11-8-21	P
alpha-Chlordane	**0.28**	0.050	EPA 8081B	11-1-21	11-8-21	P
4,4'-DDE	**0.32**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endosulfan I	**0.44**	0.050	EPA 8081B	11-1-21	11-8-21	P
Dieldrin	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endrin	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
4,4'-DDD	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endosulfan II	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
4,4'-DDT	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Endrin Aldehyde	**ND**	0.050	EPA 8081B	11-1-21	11-8-21	
Methoxychlor	**ND**	0.10	EPA 8081B	11-1-21	11-8-21	
Endosulfan Sulfate	**0.060**	0.050	EPA 8081B	11-1-21	11-8-21	P
Endrin Ketone	**ND**	0.20	EPA 8081B	11-1-21	11-8-21	
Toxaphene	**ND**	0.50	EPA 8081B	11-1-21	11-8-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
alpha-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Aldrin	**0.0022**	0.0021	EPA 8081B	11-1-21	11-2-21	P
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.011	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0053	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.021	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.053	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*50*	*25-114*				
DCB	*75*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
alpha-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0051	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.051	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*46*	*25-114*				
DCB	*83*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-1-21	11-2-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-1-21	11-2-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-1-21	11-2-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-1-21	11-2-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-1-21	11-2-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-1-21	11-2-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*45*	*25-114*				
DCB	*86*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1103W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
beta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
delta-BHC	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Heptachlor	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Aldrin	**ND**	0.0020	EPA 8081B	11-3-21	11-3-21	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	11-3-21	11-3-21	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDE	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan I	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Dieldrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDD	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endosulfan II	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
4,4'-DDT	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Methoxychlor	**ND**	0.010	EPA 8081B	11-3-21	11-3-21	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	11-3-21	11-3-21	
Endrin Ketone	**ND**	0.020	EPA 8081B	11-3-21	11-3-21	
Toxaphene	**ND**	0.050	EPA 8081B	11-3-21	11-3-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*60*	*25-114*				
DCB	*91*	*30-137*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
alpha-BHC	**0.0694**	**0.0695**	0.102	0.102	ND	**68**	**68**	50-130	0	15	
gamma-BHC (Lindane)	**0.0712**	**0.0711**	0.102	0.102	ND	**70**	**70**	50-130	0	15	
beta-BHC	**0.0646**	**0.0633**	0.102	0.102	ND	**63**	**62**	50-130	2	15	
delta-BHC	**0.0780**	**0.0753**	0.102	0.102	ND	**76**	**74**	50-130	4	15	
Heptachlor	**0.0747**	**0.0769**	0.102	0.102	ND	**73**	**76**	50-130	3	15	
Aldrin	**0.0631**	**0.0659**	0.102	0.102	0.00217	**59**	**63**	50-130	4	15	
Heptachlor Epoxide	**0.0732**	**0.0717**	0.102	0.102	ND	**71**	**71**	50-130	2	15	
gamma-Chlordane	**0.0629**	**0.0621**	0.102	0.102	ND	**61**	**61**	50-130	1	15	
alpha-Chlordane	**0.0632**	**0.0616**	0.102	0.102	ND	**62**	**61**	50-130	3	15	
4,4'-DDE	**0.0737**	**0.0712**	0.102	0.102	ND	**72**	**70**	50-130	3	15	
Endosulfan I	**0.0730**	**0.0716**	0.102	0.102	ND	**71**	**71**	50-130	2	15	
Dieldrin	**0.0756**	**0.0722**	0.102	0.102	ND	**74**	**71**	50-130	5	15	
Endrin	**0.0824**	**0.0815**	0.102	0.102	ND	**80**	**80**	50-130	1	15	
4,4'-DDD	**0.0870**	**0.0794**	0.102	0.102	ND	**85**	**78**	50-130	9	15	
Endosulfan II	**0.0718**	**0.0679**	0.102	0.102	ND	**70**	**67**	50-130	6	15	
4,4'-DDT	**0.0886**	**0.0819**	0.102	0.102	ND	**86**	**81**	50-130	8	15	
Endrin Aldehyde	**0.0683**	**0.0649**	0.102	0.102	ND	**67**	**64**	50-130	5	15	
Methoxychlor	**0.0775**	**0.0734**	0.102	0.102	ND	**76**	**72**	50-130	5	15	
Endosulfan Sulfate	**0.0710**	**0.0683**	0.102	0.102	ND	**69**	**67**	50-130	4	15	
Endrin Ketone	**0.0789**	**0.0753**	0.102	0.102	ND	**77**	**74**	50-130	5	15	
Surrogate:											
TCMX						*48*	*54*	*25-114*			
DCB						*80*	*77*	*30-137*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	Spike Level	Source Result	Percent Recovery	Recovery Limits	Flags
SPIKE BLANK						
Laboratory ID:	SB1101W2					
alpha-BHC	**0.0723**	0.100	N/A	**72**	42-113	
gamma-BHC (Lindane)	**0.0726**	0.100	N/A	**73**	45-114	
beta-BHC	**0.0703**	0.100	N/A	**70**	40-118	
delta-BHC	**0.0746**	0.100	N/A	**75**	20-125	
Heptachlor	**0.0727**	0.100	N/A	**73**	41-120	
Aldrin	**0.0671**	0.100	N/A	**67**	35-115	
Heptachlor Epoxide	**0.0717**	0.100	N/A	**72**	50-118	
gamma-Chlordane	**0.0647**	0.100	N/A	**65**	46-110	
alpha-Chlordane	**0.0646**	0.100	N/A	**65**	38-112	
4,4'-DDE	**0.0810**	0.100	N/A	**81**	41-127	
Endosulfan I	**0.0716**	0.100	N/A	**72**	45-119	
Dieldrin	**0.0752**	0.100	N/A	**75**	46-115	
Endrin	**0.0802**	0.100	N/A	**80**	52-124	
4,4'-DDD	**0.0828**	0.100	N/A	**83**	52-121	
Endosulfan II	**0.0685**	0.100	N/A	**69**	44-114	
4,4'-DDT	**0.0902**	0.100	N/A	**90**	48-123	
Endrin Aldehyde	**0.0642**	0.100	N/A	**64**	45-114	
Methoxychlor	**0.113**	0.100	N/A	**113**	49-130	
Endosulfan Sulfate	**0.0692**	0.100	N/A	**69**	39-117	
Endrin Ketone	**0.0724**	0.100	N/A	**72**	53-119	
Surrogate:						
TCMX				*60*	*25-114*	
DCB				*86*	*30-137*	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB1103W2										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0736**	**0.0697**	0.100	0.100	N/A	**74**	**70**	42-113	5	19	
gamma-BHC (Lindane)	**0.0738**	**0.0701**	0.100	0.100	N/A	**74**	**70**	45-114	5	15	
beta-BHC	**0.0725**	**0.0683**	0.100	0.100	N/A	**73**	**68**	40-118	6	15	
delta-BHC	**0.0729**	**0.0710**	0.100	0.100	N/A	**73**	**71**	20-125	3	15	
Heptachlor	**0.0759**	**0.0719**	0.100	0.100	N/A	**76**	**72**	41-120	5	16	
Aldrin	**0.0707**	**0.0656**	0.100	0.100	N/A	**71**	**66**	35-115	7	15	
Heptachlor Epoxide	**0.0725**	**0.0687**	0.100	0.100	N/A	**73**	**69**	50-118	5	15	
gamma-Chlordane	**0.0666**	**0.0632**	0.100	0.100	N/A	**67**	**63**	46-110	5	15	
alpha-Chlordane	**0.0666**	**0.0628**	0.100	0.100	N/A	**67**	**63**	38-112	6	15	
4,4'-DDE	**0.0831**	**0.0787**	0.100	0.100	N/A	**83**	**79**	41-127	5	15	
Endosulfan I	**0.0737**	**0.0695**	0.100	0.100	N/A	**74**	**70**	45-119	6	15	
Dieldrin	**0.0777**	**0.0728**	0.100	0.100	N/A	**78**	**73**	46-115	7	15	
Endrin	**0.0796**	**0.0737**	0.100	0.100	N/A	**80**	**74**	52-124	8	15	
4,4'-DDD	**0.0848**	**0.0782**	0.100	0.100	N/A	**85**	**78**	52-121	8	15	
Endosulfan II	**0.0709**	**0.0660**	0.100	0.100	N/A	**71**	**66**	44-114	7	15	
4,4'-DDT	**0.0894**	**0.0834**	0.100	0.100	N/A	**89**	**83**	48-123	7	15	
Endrin Aldehyde	**0.0687**	**0.0643**	0.100	0.100	N/A	**69**	**64**	45-114	7	15	
Methoxychlor	**0.103**	**0.0975**	0.100	0.100	N/A	**103**	**97**	49-130	5	15	
Endosulfan Sulfate	**0.0712**	**0.0647**	0.100	0.100	N/A	**71**	**65**	39-117	10	15	
Endrin Ketone	**0.0748**	**0.0701**	0.100	0.100	N/A	**75**	**70**	53-119	6	15	
Surrogate:											
TCMX						*56*	*56*	*25-114*			
DCB						*70*	*83*	*30-137*			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**83**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**6.5**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**96**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**2.8**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Arsenic	**8.6**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**29**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**12**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**1.4**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**250**	69	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**5.0**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Arsenic	**6.1**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**270**	69	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**9.4**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Arsenic	**5.6**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**64**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**42**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Arsenic	**4.2**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**150**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**16**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Arsenic	**4.1**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Arsenic	**3.8**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1103WM1					
Arsenic	**ND**	3.3	EPA 200.8	11-3-21	11-3-21	
Barium	**ND**	28	EPA 200.8	11-3-21	11-3-21	
Cadmium	**ND**	4.4	EPA 200.8	11-3-21	11-3-21	
Chromium	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Lead	**ND**	1.1	EPA 200.8	11-3-21	11-3-21	
Selenium	**ND**	5.6	EPA 200.8	11-3-21	11-3-21	
Silver	**ND**	11	EPA 200.8	11-3-21	11-3-21	
Laboratory ID:	MB1103W1					
Mercury	**ND**	0.50	EPA 7470A	11-3-21	11-3-21	

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	10-289-08									
	ORIG	DUP								
Arsenic	**4.09**	**4.24**	NA	NA		NA	NA	4	20	
Barium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Laboratory ID:	10-289-08									
Mercury	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	10-289-08									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**112**	**116**	111	111	4.09	**97**	**100**	75-125	3	20
Barium	**121**	**124**	111	111	13.9	**97**	**99**	75-125	2	20
Cadmium	**108**	**108**	111	111	ND	**97**	**97**	75-125	0	20
Chromium	**107**	**108**	111	111	ND	**96**	**98**	75-125	1	20
Lead	**107**	**108**	111	111	ND	**96**	**97**	75-125	1	20
Selenium	**104**	**115**	111	111	ND	**94**	**104**	75-125	10	20
Silver	**106**	**108**	111	111	ND	**95**	**97**	75-125	2	20
Laboratory ID:	10-289-08									
Mercury	**12.1**	**12.0**	12.5	12.5	ND	**96**	**96**	75-125	0	20
SPIKE BLANK										
Laboratory ID:	SB1103WM1									
Arsenic	**122**		111		N/A	**110**	85-115			
Barium	**122**		111		N/A	**110**	85-115			
Cadmium	**117**		111		N/A	**105**	85-115			
Chromium	**119**		111		N/A	**108**	85-115			
Lead	**121**		111		N/A	**109**	85-115			
Selenium	**123**		111		N/A	**111**	85-115			
Silver	**125**		111		N/A	**113**	85-115			
Laboratory ID:	SB1103W1									
Mercury	**12.4**		12.5		N/A	**99**	80-120			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*99*	*66-117*				
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*99*	*66-117*				
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Benzene	**7.8**	5.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*101*	*66-117*				
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*98*	*66-117*				
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Benzene	**18**	10	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*101*	*66-117*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

BENZENE
EPA 8021B
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1101W2					
Benzene	**ND**	1.0	EPA 8021B	11-1-21	11-1-21	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*100*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Benzene	**ND**	**ND**	NA	NA		NA		NA	NA	30	
Surrogate:											
Fluorobenzene						*100*	*100*	*66-117*			
SPIKE BLANKS											
Laboratory ID:	SB1101W1										
	SB	SBD	SB	SBD		SB	SBD				
Benzene	**51.9**	**51.1**	50.0	50.0		**104**	**102**	80-116	2	11	
Surrogate:											
Fluorobenzene						*104*	*105*	*66-117*			

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Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

pH
SM 4500-H B

Matrix: Water
Units: pH (@ 25ºC)

Analyte	Result	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**				
Laboratory ID:	10-289-01				
pH	**6.9**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-2-102821**				
Laboratory ID:	10-289-02				
pH	**8.6**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MWD-21-1-102821**				
Laboratory ID:	10-289-03				
pH	**6.5**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-3-102821**				
Laboratory ID:	10-289-04				
pH	**7.2**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-4-102821**				
Laboratory ID:	10-289-05				
pH	**7.0**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-5-102821**				
Laboratory ID:	10-289-06				
pH	**6.5**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-6-102821**				
Laboratory ID:	10-289-07				
pH	**7.1**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**MW-21-7-102821**				
Laboratory ID:	10-289-08				
pH	**7.0**	SM 4500-H B	10-29-21	10-29-21	
Client ID:	**DUP-1-102821**				
Laboratory ID:	10-289-09				
pH	**6.9**	SM 4500-H B	10-29-21	10-29-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**47**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**57**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Arsenic	**7.3**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

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Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**150**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**190**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**68**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Arsenic	**3.5**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Arsenic	**3.5**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029F1					
Arsenic	**ND**	3.0	EPA 200.8	10-29-21	11-3-21	
Barium	**ND**	25	EPA 200.8	10-29-21	11-3-21	
Cadmium	**ND**	4.0	EPA 200.8	10-29-21	11-3-21	
Chromium	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Lead	**ND**	1.0	EPA 200.8	10-29-21	11-3-21	
Selenium	**ND**	5.0	EPA 200.8	10-29-21	11-3-21	
Silver	**ND**	10	EPA 200.8	10-29-21	11-3-21	
Laboratory ID:	MB1029F1					
Mercury	**ND**	0.50	EPA 7470A	10-29-21	11-3-21	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Arsenic	**3.46**	**3.80**	NA	NA		NA		NA	9	20	
Barium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	10-289-08										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**86.8**	**86.2**	80.0	80.0	3.46	**104**	**103**	75-125	1	20	
Barium	**91.8**	**91.4**	80.0	80.0	11.9	**100**	**99**	75-125	0	20	
Cadmium	**79.6**	**80.0**	80.0	80.0	ND	**100**	**100**	75-125	1	20	
Chromium	**74.8**	**75.8**	80.0	80.0	ND	**94**	**95**	75-125	1	20	
Lead	**79.0**	**79.6**	80.0	80.0	ND	**99**	**100**	75-125	1	20	
Selenium	**94.8**	**93.4**	80.0	80.0	ND	**119**	**117**	75-125	1	20	
Silver	**80.6**	**79.6**	80.0	80.0	ND	**101**	**100**	75-125	1	20	
Laboratory ID:	10-289-08										
Mercury	**11.8**	**11.5**	12.5	12.5	ND	**94**	**92**	75-125	3	20	
SPIKE BLANK											
Laboratory ID:	SB1029F1										
Arsenic	**81.0**		80.0		N/A	**101**		85-115			
Barium	**82.4**		80.0		N/A	**103**		85-115			
Cadmium	**78.4**		80.0		N/A	**98**		85-115			
Chromium	**75.6**		80.0		N/A	**95**		85-115			
Lead	**83.0**		80.0		N/A	**104**		85-115			
Selenium	**88.0**		80.0		N/A	**110**		85-115			
Silver	**83.0**		80.0		N/A	**104**		85-115			
Laboratory ID:	SB1029F1										
Mercury	**12.1**		12.5		N/A	**97**		80-120			

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Iron	**12000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Iron	**85000**	250	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Iron	**4600**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Iron	**20000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Iron	**17000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Iron	**16000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Iron	**17000**	50	EPA 6010D	11-15-21	11-16-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Iron	**900**	50	EPA 6010D	11-15-21	11-16-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Iron	**630**	50	EPA 6010D	11-15-21	11-16-21	

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

TOTAL IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1115WH3					
Iron	**ND**	50	EPA 6010D	11-15-21	11-16-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-01										
	ORIG	DUP									
Iron	**12500**	**12100**	NA	NA		NA		NA	3	20	
MATRIX SPIKES											
Laboratory ID:	10-289-01										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**35100**	**35800**	20000	20000	12500	**113**	**117**	75-125	2	20	
SPIKE BLANK											
Laboratory ID:	SB1115WH3										
Iron	**22000**		20000		N/A	**110**		80-120			

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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-102721**					
Laboratory ID:	10-289-01					
Iron	**430**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-2-102821**					
Laboratory ID:	10-289-02					
Iron	**62000**	500	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MWD-21-1-102821**					
Laboratory ID:	10-289-03					
Iron	**330**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-3-102821**					
Laboratory ID:	10-289-04					
Iron	**800**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-4-102821**					
Laboratory ID:	10-289-05					
Iron	**540**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-5-102821**					
Laboratory ID:	10-289-06					
Iron	**4400**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-6-102821**					
Laboratory ID:	10-289-07					
Iron	**570**	56	EPA 6010D	10-29-21	11-17-21	
Client ID:	**MW-21-7-102821**					
Laboratory ID:	10-289-08					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**DUP-1-102821**					
Laboratory ID:	10-289-09					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

This report pertains to the samples analyzed in accordance with the chain of custody,
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Date of Report: November 18, 2021
Samples Submitted: October 29, 2021
Laboratory Reference: 2110-289
Project: Whitmarsh Landfill

DISSOLVED IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB1029F1					
Iron	**ND**	56	EPA 6010D	10-29-21	11-17-21	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	10-289-08										
	ORIG	DUP									
Iron	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	10-289-08										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**24800**	**24600**	22200	22200	ND	**112**	**111**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB1029F1										
Iron	**24600**		22200		N/A	**111**		80-120			

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OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z -

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Nov 16 2021
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your WHITMARSH LANDFILL project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-21-1-102721	Water	21-A016741	CONV
MW-21-2-102821	Water	21-A016742	CONV
MWD-21-1-102821	Water	21-A016743	CONV
MW-21-3-102821	Water	21-A016744	CONV
MW-21-4-102821	Water	21-A016745	CONV
MW-21-5-102821	Water	21-A016746	CONV
MW-21-6-102821	Water	21-A016747	CONV
MW-21-7-102821	Water	21-A016748	CONV
DUP-1-102821	Water	21-A016749	CONV

Your samples were received on Monday, November 1, 2021. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

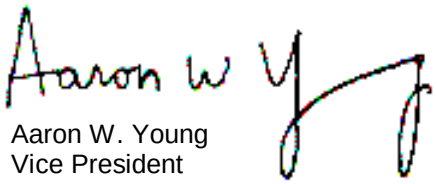
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Vice President

SDG #: 2121700
PO Number: 10-289

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
Project Name: WHITMARSH LANDFILL
SDG Number: 2121700
PO Number: 10-289
All results reported on an as received basis.

Date Received: 11/01/21
Date Reported: 11/16/21

AMTEST Identification Number **21-A016741**
Client Identification **MW-21-1-102721**
Sampling Date **10/27/21, 11:47**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.85	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016742**
Client Identification **MW-21-2-102821**
Sampling Date **10/28/21, 09:15**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.31	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016743**
Client Identification **MWD-21-1-102821**
Sampling Date **10/28/21, 10:55**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016744**
Client Identification **MW-21-3-102821**
Sampling Date **10/28/21, 12:28**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.26	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016745**
Client Identification **MW-21-4-102821**
Sampling Date **10/28/21, 13:58**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.29	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016746**
Client Identification **MW-21-5-102821**
Sampling Date **10/28/21, 15:05**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016747**
Client Identification **MW-21-6-102821**
Sampling Date **10/28/21, 16:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.25	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016748**
Client Identification **MW-21-7-102821**
Sampling Date **10/28/21, 17:30**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.24	g/kg		0.05	SM 2520B	KW	11/03/21

AMTEST Identification Number **21-A016749**
Client Identification **DUP-1-102821**
Sampling Date **10/28/21, 17:30**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Salinity	0.24	g/kg		0.05	SM 2520B	KW	11/03/21

Aaron W. Young
Vice President

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 10-289

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other:

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: Whitmarsh Landfill

Project Name:

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
	MW-21-1-102721 16741	10/27/21	11:47	W	1	Salinity SM2520D
	MW-21-2-102821 42	10/28/21	9:15	W	1	Salinity SM2520D
	MW-21-1-102821 43	10/28/21	10:55	W	1	Salinity SM2520D
	MW-21-3-102821 44	10/28/21	12:28	W	1	Salinity SM2520D
	MW-21-4-102821 45	10/28/21	13:58	W	1	Salinity SM2520D
	MW-21-5-102821 46	10/28/21	15:05	W	1	Salinity SM2520D
	MW-21-6-102821 47	10/28/21	16:20	W	1	Salinity SM2520D
	MW-21-7-102821 48	10/28/21	17:30	W	1	Salinity SM2520D
	DUP-1-102821 49	10/28/21	17:30	W	1	Salinity SM2520D

	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	11/1/21	1208	
Received by:	AMTEST T=4.4	11/1/21	1208	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

P.6

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Company: Wood E&I
Project Number:
Project Name: Whitmarsh Landfill
Project Manager: Kaorus Tahghighi
Sampled by: Cheyenne Ginther

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Laboratory Number: 10-289

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers
1	MW-21-1-102721	10/27/21	1147		11
2	MW-21-2-102821	10/28/21	915		11
3	MW-21-1-102821		1055		11
4	MW-21-3-102821		1228		11
5	MW-21-4-102821		1359		11
6	MW-21-5-102821		1505		11
7	MW-21-6-102821		1620		11
8	MW-21-7-102821		1730		20
9	DUP-1-102821		1730		11

Lab ID	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	Total ~~MTCA~~ Metals IRON	~~TCLP Metals~~ DISSOLVED IRON	HEM (oil and grease) 1664A	Benzene EPA 8021B	Salinity + pH	Dissolved RCRA Metals EPA 200.8/ 7470A	% Moisture
1								2		2	2			1	X	X		3			
2															X	X			X		
3															X	X					
4															X	X					
5															X	X					
6															X	X					
7															X	X					
8															X	X					
9															X	X					

	Signature	Company	Date	Time
Relinquished	Cheyenne Ginther	Wood E&I	10/29/21	1412
Received		OSE	10/29/21	1412
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
Call Kaorus Tahghighi 206-641-6301 if questions. (X) Added 11/10/21, DB (ST4)

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

OnSite Environmental Inc.
14648 NE 95th Street, Redmond, WA 98052 • (425) 883-3881

February 15, 2022

Koorus Tahghighi
Wood Environment and Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA 98101

Re: Analytical Data for Project PS21204410.02.****
Laboratory Reference No. 2201-245

Dear Koorus:

Enclosed are the analytical results and associated quality control data for samples submitted on January 28, 2022.

The standard policy of OnSite Environmental, Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

Case Narrative

Samples were collected on January 28, 2022 and received by the laboratory on January 28, 2022. They were maintained at the laboratory at a temperature of 2°C to 6°C.

Please note that any and all soil sample results are reported on a dry-weight basis, unless otherwise noted below.

General QA/QC issues associated with the analytical data enclosed in this laboratory report will be indicated with a reference to a comment or explanation on the Data Qualifier page. More complex and involved QA/QC issues will be discussed in detail below.

Semivolatiles EPA 8270E/SIM Analysis

The matrix spike duplicate had one recovery above control limits, which is believed to be caused by the sample matrix. The spike blank/spike blank duplicate pair extracted with this batch had all parameters in control, no further action was deemed necessary.

PCBs EPA 8082A Analysis

Sample MW-21-6-012722 was used as the MS/MSD. The percent recovery values (%R) for Aroclor 1260 were below the quality control limits of 80-119%. This is attributed to the matrix effects of the sample on the instrument and no further action was performed.

Organochlorine Pesticides by EPA 8081B Analysis

Sample MW-21-6-012722 was used as the MS/MSD. Due to severe effects of the matrix on the instrument, the percent recovery value (%R) for delta-BHC was below the quality control limits of 50-130% in the MS. As a result, the RPD (24%) was above the quality control limit of 15%. The Spike Blank and Spike Blank Duplicate were within quality control limits and no further action was performed.

Please note that any other QA/QC issues associated with these extractions and analyses will be indicated with a footnote reference and discussed in detail on the Data Qualifier page.

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**1.2**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
2,4-Dinitrophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.45**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**0.34**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.2	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*36*	*10 - 92*				
Nitrobenzene-d5	*81*	*32 - 105*				
2-Fluorobiphenyl	*82*	*38 - 105*				
2,4,6-Tribromophenol	*105*	*25 - 124*				
Terphenyl-d14	*85*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**3.1**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**1.0**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**0.22**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**4.5**	1.0	EPA 8270E	2-1-22	2-2-22	
1-Methylnaphthalene	**9.0**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**1.6**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**1.0**	1.0	EPA 8270E	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**1.3**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**1.1**	1.0	EPA 8270E	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*49*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*77*	*32 - 105*				
2-Fluorobiphenyl	*79*	*38 - 105*				
2,4,6-Tribromophenol	*100*	*25 - 124*				
Terphenyl-d14	*84*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
n-Nitrosodimethylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.2	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
2,4-Dinitrophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.095	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.8	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.95	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0095	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*46*	*10 - 82*				
Phenol-d6	*33*	*10 - 92*				
Nitrobenzene-d5	*73*	*32 - 105*				
2-Fluorobiphenyl	*75*	*38 - 105*				
2,4,6-Tribromophenol	*96*	*25 - 124*				
Terphenyl-d14	*92*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
n-Nitrosodimethylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.14**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.099	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.99	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0099	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*80*	*32 - 105*				
2-Fluorobiphenyl	*78*	*38 - 105*				
2,4,6-Tribromophenol	*101*	*25 - 124*				
Terphenyl-d14	*83*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**0.33**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**0.28**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*49*	*10 - 82*				
Phenol-d6	*34*	*10 - 92*				
Nitrobenzene-d5	*79*	*32 - 105*				
2-Fluorobiphenyl	*80*	*38 - 105*				
2,4,6-Tribromophenol	*100*	*25 - 124*				
Terphenyl-d14	*88*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
n-Nitrosodimethylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Phenol	**1.8**	0.97	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**20**	0.97	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**28**	0.97	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**140**	9.7	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**0.69**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**1.1**	0.97	EPA 8270E	2-1-22	2-2-22	
1-Methylnaphthalene	**0.78**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.19	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.097	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.015	EPA 8270E/SIM	2-1-22	2-2-22	U1
Chrysene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	0.97	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0097	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*50*	*10 - 82*				
Phenol-d6	*35*	*10 - 92*				
Nitrobenzene-d5	*83*	*32 - 105*				
2-Fluorobiphenyl	*84*	*38 - 105*				
2,4,6-Tribromophenol	*104*	*25 - 124*				
Terphenyl-d14	*112*	*42 - 116*				

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Date of Report: February 15, 2022
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Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**51**	20	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**56**	20	EPA 8270E	2-1-22	2-4-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**470**	20	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**4.9**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**3.7**	1.0	EPA 8270E	2-1-22	2-3-22	
1-Methylnaphthalene	**3.5**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**2.3**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**0.43**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	U1
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Fluorene	**1.0**	1.0	EPA 8270E	2-1-22	2-3-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**21**	5.1	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**0.33**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.23	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.014	EPA 8270E/SIM	2-1-22	2-2-22	U1
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*31*	*10 - 82*				
Phenol-d6	*24*	*10 - 92*				
Nitrobenzene-d5	*32*	*32 - 105*				
2-Fluorobiphenyl	*59*	*38 - 105*				
2,4,6-Tribromophenol	*79*	*25 - 124*				
Terphenyl-d14	*89*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
n-Nitrosodimethylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroisopropyl)ether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
n-Nitroso-di-n-propylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethoxy)methane	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
2,4-Dinitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Diethylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Fluorene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.098	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	4.9	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	0.98	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.0098	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*44*	*10 - 82*				
Phenol-d6	*32*	*10 - 92*				
Nitrobenzene-d5	*73*	*32 - 105*				
2-Fluorobiphenyl	*77*	*38 - 105*				
2,4,6-Tribromophenol	*99*	*25 - 124*				
Terphenyl-d14	*88*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Aniline	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylphenol (o-Cresol)	**60**	21	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
(3+4)-Methylphenol (m,p-Cresol)	**70**	21	EPA 8270E	2-1-22	2-4-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dimethylphenol	**590**	21	EPA 8270E	2-1-22	2-4-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Naphthalene	**9.5**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Methylnaphthalene	**6.6**	1.0	EPA 8270E	2-1-22	2-3-22	
1-Methylnaphthalene	**5.4**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-3-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,4,5-Trichlorophenol	**3.2**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dimethylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Acenaphthylene	**ND**	0.12	EPA 8270E/SIM	2-1-22	2-2-22	U1
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
2,4-Dinitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Acenaphthene	**0.68**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.6	EPA 8270E	2-1-22	2-3-22	U1
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Fluorene	**1.3**	1.0	EPA 8270E	2-1-22	2-3-22	
4,6-Dinitro-2-methylphenol	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Pentachlorophenol	**26**	5.1	EPA 8270E	2-1-22	2-3-22	
Phenanthrene	**0.35**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Di-n-butylphthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Fluoranthene	**ND**	0.29	EPA 8270E/SIM	2-1-22	2-2-22	U1
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
bis-2-Ethylhexyladipate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.1	EPA 8270E	2-1-22	2-3-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-3-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*51*	*10 - 82*				
Phenol-d6	*37*	*10 - 92*				
Nitrobenzene-d5	*48*	*32 - 105*				
2-Fluorobiphenyl	*91*	*38 - 105*				
2,4,6-Tribromophenol	*109*	*25 - 124*				
Terphenyl-d14	*66*	*42 - 116*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 1 of 2

Matrix: Water
Units: ug/L

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
n-Nitrosodimethylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pyridine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Phenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Aniline	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzyl alcohol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylphenol (o-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroisopropyl)ether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
(3+4)-Methylphenol (m,p-Cresol)	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
n-Nitroso-di-n-propylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachloroethane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Nitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Isophorone	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitrophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dimethylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis(2-Chloroethoxy)methane	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2,4-Trichlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Naphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Chloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobutadiene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chloro-3-methylphenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
1-Methylnaphthalene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Hexachlorocyclopentadiene	**ND**	1.3	EPA 8270E	2-1-22	2-2-22	
2,4,6-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3-Dichloroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,4,5-Trichlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Chloronaphthalene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,4-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dimethylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
1,3-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,6-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Dinitrobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthylene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
3-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL
page 2 of 2

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
2,4-Dinitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Acenaphthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4-Nitrophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
2,4-Dinitrotoluene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Dibenzofuran	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,5,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
2,3,4,6-Tetrachlorophenol	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Diethylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Chlorophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Nitroaniline	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Fluorene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
4,6-Dinitro-2-methylphenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
n-Nitrosodiphenylamine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
1,2-Diphenylhydrazine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
4-Bromophenyl-phenylether	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Hexachlorobenzene	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Pentachlorophenol	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Phenanthrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Anthracene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Carbazole	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Di-n-butylphthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Fluoranthene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Pyrene	**ND**	0.10	EPA 8270E/SIM	2-1-22	2-2-22	
Butylbenzylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
bis-2-Ethylhexyladipate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
3,3'-Dichlorobenzidine	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[a]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Chrysene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
bis(2-Ethylhexyl)phthalate	**ND**	5.0	EPA 8270E	2-1-22	2-2-22	
Di-n-octylphthalate	**ND**	1.0	EPA 8270E	2-1-22	2-2-22	
Benzo[b]fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo(j,k)fluoranthene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[a]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Indeno[1,2,3-cd]pyrene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Dibenz[a,h]anthracene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Benzo[g,h,i]perylene	**ND**	0.010	EPA 8270E/SIM	2-1-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
2-Fluorophenol	*38*	*10 - 82*				
Phenol-d6	*30*	*10 - 92*				
Nitrobenzene-d5	*65*	*32 - 105*				
2-Fluorobiphenyl	*71*	*38 - 105*				
2,4,6-Tribromophenol	*92*	*25 - 124*				
Terphenyl-d14	*91*	*42 - 116*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

SEMIVOLATILE ORGANICS EPA 8270E/SIM
QUALITY CONTROL

Matrix: Water
Units: ug/L

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Phenol	**13.4**	**15.4**	40.7	39.9	ND	33	39	20 - 108	14	24	
2-Chlorophenol	**26.2**	**29.8**	40.7	39.9	ND	64	75	24 - 105	13	32	
1,4-Dichlorobenzene	**12.7**	**14.5**	20.3	19.9	ND	63	73	24 - 100	13	36	
n-Nitroso-di-n-propylamine	**18.2**	**19.7**	20.3	19.9	ND	90	99	21 - 143	8	30	
1,2,4-Trichlorobenzene	**13.8**	**16.1**	20.3	19.9	ND	68	81	34 - 105	15	34	
4-Chloro-3-methylphenol	**28.0**	**30.8**	40.7	39.9	ND	69	77	44 - 113	10	21	
Acenaphthene	**14.7**	**16.5**	20.3	19.9	ND	72	83	47 - 106	12	19	
4-Nitrophenol	**19.3**	**21.6**	40.7	39.9	ND	47	54	20 - 127	11	37	
2,4-Dinitrotoluene	**16.0**	**17.2**	20.3	19.9	ND	79	86	45 - 106	7	19	
Pentachlorophenol	**74.0**	**81.7**	40.7	39.9	21.4	129	151	20 - 136	10	39	V
Pyrene	**18.4**	**19.4**	20.3	19.9	ND	91	97	47 - 112	5	23	
Surrogate:											
2-Fluorophenol						*43*	*55*	*10 - 82*			
Phenol-d6						*33*	*38*	*10 - 92*			
Nitrobenzene-d5						*40*	*47*	*32 - 105*			
2-Fluorobiphenyl						*79*	*87*	*38 - 105*			
2,4,6-Tribromophenol						*90*	*102*	*25 - 124*			
Terphenyl-d14						*101*	*115*	*42 - 116*			
SPIKE BLANKS											
Laboratory ID:	SB0201W2										
	SB	SBD	SB	SBD		SB	SBD				
Phenol	**14.5**	**15.3**	40.0	40.0		36	38	21 - 53	5	26	
2-Chlorophenol	**30.1**	**30.7**	40.0	40.0		75	77	38 - 92	2	28	
1,4-Dichlorobenzene	**13.8**	**13.3**	20.0	20.0		69	67	30 - 88	4	32	
n-Nitroso-di-n-propylamine	**15.3**	**13.6**	20.0	20.0		77	68	40 - 103	12	27	
1,2,4-Trichlorobenzene	**16.1**	**16.0**	20.0	20.0		81	80	37 - 95	1	29	
4-Chloro-3-methylphenol	**38.5**	**39.8**	40.0	40.0		96	100	50 - 101	3	17	
Acenaphthene	**15.3**	**15.2**	20.0	20.0		77	76	46 - 97	1	19	
4-Nitrophenol	**21.3**	**22.2**	40.0	40.0		53	56	23 - 64	4	34	
2,4-Dinitrotoluene	**16.1**	**16.1**	20.0	20.0		81	81	46 - 100	0	17	
Pentachlorophenol	**47.1**	**49.1**	40.0	40.0		118	123	39 - 123	4	29	
Pyrene	**19.4**	**18.0**	20.0	20.0		97	90	52 - 107	7	19	
Surrogate:											
2-Fluorophenol						*58*	*57*	*10 - 82*			
Phenol-d6						*39*	*40*	*10 - 92*			
Nitrobenzene-d5						*90*	*81*	*32 - 105*			
2-Fluorobiphenyl						*82*	*85*	*38 - 105*			
2,4,6-Tribromophenol						*104*	*106*	*25 - 124*			
Terphenyl-d14						*97*	*93*	*42 - 116*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Aroclor 1016	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Aroclor 1016	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**0.11**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.054	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*78*	*42-140*				
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Aroclor 1016	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*87*	*42-140*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Aroclor 1016	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.050	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*95*	*42-140*				
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Aroclor 1016	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.6	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.56	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.056	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*93*	*42-140*				
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Aroclor 1016	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	4.9	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.49	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*91*	*42-140*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Aroclor 1016	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.2	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.52	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.052	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*101*	*42-140*				
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Aroclor 1016	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1221	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1232	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1242	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1248	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1254	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Aroclor 1260	**ND**	0.049	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*101*	*42-140*				
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Aroclor 1016	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1221	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1232	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1242	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1248	**ND**	5.3	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1254	**ND**	0.53	EPA 8082A	1-31-22	2-8-22	U1
Aroclor 1260	**ND**	0.053	EPA 8082A	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*92*	*42-140*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

PCBs EPA 8082A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131W1					
Aroclor 1016	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1221	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1232	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1242	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1248	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1254	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Aroclor 1260	**ND**	0.050	EPA 8082A	1-31-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
DCB	*94*	*42-140*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Aroclor 1260	**0.394**	**0.393**	0.505	0.568	ND	**78**	**69**	80-119	0	17	I,I
Surrogate:											
DCB						*84*	*96*	*42-140*			
SPIKE BLANKS											
Laboratory ID:	SB0131W1										
	SB	SBD	SB	SBD		SB	SBD				
Aroclor 1260	**0.430**	**0.417**	0.500	0.500	N/A	**86**	**83**	73-131	3	12	
Surrogate:											
DCB						*90*	*84*	*42-140*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
alpha-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0021	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**0.0058**	0.0053	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0053	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.021	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.053	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*62*	*25-114*				
DCB	*72*	*30-137*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
alpha-BHC	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**0.017**	0.0054	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**0.0061**	0.0054	EPA 8081B	1-31-22	2-2-22	P
Heptachlor	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0021	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0032	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**0.012**	0.0054	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.017**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0054	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**0.0074**	0.0054	EPA 8081B	1-31-22	2-2-22	P
Endrin Ketone	**ND**	0.021	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.054	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*64*	*25-114*				
DCB	*71*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
alpha-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0029	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.0098	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0049	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.049	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*75*	*25-114*				
DCB	*77*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
alpha-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	2-2-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	2-2-22	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.0073**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endosulfan I	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDD	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
4,4'-DDT	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.010	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.050	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*65*	*25-114*				
DCB	*82*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
alpha-BHC	**0.0073**	0.0056	EPA 8081B	1-31-22	2-2-22	
gamma-BHC (Lindane)	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
beta-BHC	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
delta-BHC	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Heptachlor	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Aldrin	**0.43**	0.022	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.089**	0.0033	EPA 8081B	1-31-22	2-2-22	P
gamma-Chlordane	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
alpha-Chlordane	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
4,4'-DDE	**0.20**	0.056	EPA 8081B	1-31-22	2-8-22	
Endosulfan I	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Dieldrin	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endrin	**0.061**	0.0056	EPA 8081B	1-31-22	2-2-22	P
4,4'-DDD	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endosulfan II	**0.048**	0.0056	EPA 8081B	1-31-22	2-2-22	P
4,4'-DDT	**0.014**	0.0056	EPA 8081B	1-31-22	2-2-22	P
Endrin Aldehyde	**0.011**	0.0056	EPA 8081B	1-31-22	2-2-22	
Methoxychlor	**ND**	0.011	EPA 8081B	1-31-22	2-2-22	
Endosulfan Sulfate	**ND**	0.0056	EPA 8081B	1-31-22	2-2-22	
Endrin Ketone	**ND**	0.022	EPA 8081B	1-31-22	2-2-22	
Toxaphene	**ND**	0.056	EPA 8081B	1-31-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*64*	*25-114*				
DCB	*88*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
alpha-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Aldrin	**0.68**	0.020	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.093**	0.030	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.49**	0.049	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.086**	0.049	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.34**	0.049	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDD	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.27**	0.049	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**0.38**	0.049	EPA 8081B	1-31-22	2-8-22	
Endrin Aldehyde	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Methoxychlor	**0.11**	0.099	EPA 8081B	1-31-22	2-8-22	P
Endosulfan Sulfate	**ND**	0.049	EPA 8081B	1-31-22	2-8-22	
Endrin Ketone	**ND**	0.20	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	0.49	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
alpha-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	1.0	EPA 8081B	1-31-22	2-8-22	U1
Aldrin	**2.1**	0.041	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.29**	0.062	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.67**	0.10	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.22**	0.10	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.61**	0.10	EPA 8081B	1-31-22	2-8-22	
4,4'-DDD	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.27**	0.10	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Endrin Aldehyde	**ND**	0.10	EPA 8081B	1-31-22	2-8-22	
Methoxychlor	**ND**	0.21	EPA 8081B	1-31-22	2-8-22	
Endosulfan Sulfate	**0.12**	0.10	EPA 8081B	1-31-22	2-8-22	
Endrin Ketone	**ND**	0.41	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	1.0	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	---	*25-114*				S
DCB	---	*30-137*				S

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
alpha-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
gamma-BHC (Lindane)	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
beta-BHC	**0.0061**	0.0049	EPA 8081B	1-31-22	2-7-22	P
delta-BHC	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Heptachlor	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Aldrin	**0.0028**	0.0020	EPA 8081B	1-31-22	2-7-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	2-7-22	
gamma-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
alpha-Chlordane	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDE	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endosulfan I	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Dieldrin	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDD	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endosulfan II	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
4,4'-DDT	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin Aldehyde	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Methoxychlor	**ND**	0.0099	EPA 8081B	1-31-22	2-7-22	
Endosulfan Sulfate	**ND**	0.0049	EPA 8081B	1-31-22	2-7-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	2-7-22	
Toxaphene	**ND**	0.049	EPA 8081B	1-31-22	2-7-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*52*	*25-114*				
DCB	*56*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
alpha-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
gamma-BHC (Lindane)	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
beta-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
delta-BHC	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Heptachlor	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Aldrin	**2.5**	0.042	EPA 8081B	1-31-22	2-8-22	P
Heptachlor Epoxide	**0.34**	0.063	EPA 8081B	1-31-22	2-8-22	P
gamma-Chlordane	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
alpha-Chlordane	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
4,4'-DDE	**0.68**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endosulfan I	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Dieldrin	**0.26**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin	**0.63**	0.11	EPA 8081B	1-31-22	2-8-22	
4,4'-DDD	**ND**	0.11	EPA 8081B	1-31-22	2-8-22	
Endosulfan II	**0.23**	0.11	EPA 8081B	1-31-22	2-8-22	P
4,4'-DDT	**0.17**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin Aldehyde	**0.11**	0.11	EPA 8081B	1-31-22	2-8-22	P
Methoxychlor	**ND**	0.21	EPA 8081B	1-31-22	2-8-22	
Endosulfan Sulfate	**0.13**	0.11	EPA 8081B	1-31-22	2-8-22	P
Endrin Ketone	**ND**	0.42	EPA 8081B	1-31-22	2-8-22	
Toxaphene	**ND**	1.1	EPA 8081B	1-31-22	2-8-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*0*	*25-114*				
DCB	*0*	*30-137*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131W1					
alpha-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
gamma-BHC (Lindane)	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
beta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
delta-BHC	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Heptachlor	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Aldrin	**ND**	0.0020	EPA 8081B	1-31-22	1-31-22	
Heptachlor Epoxide	**ND**	0.0030	EPA 8081B	1-31-22	1-31-22	
gamma-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
alpha-Chlordane	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDE	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endosulfan I	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Dieldrin	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDD	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endosulfan II	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
4,4'-DDT	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin Aldehyde	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Methoxychlor	**ND**	0.010	EPA 8081B	1-31-22	1-31-22	
Endosulfan Sulfate	**ND**	0.0050	EPA 8081B	1-31-22	1-31-22	
Endrin Ketone	**ND**	0.020	EPA 8081B	1-31-22	1-31-22	
Toxaphene	**ND**	0.050	EPA 8081B	1-31-22	1-31-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
TCMX	*56*	*25-114*				
DCB	*100*	*30-137*				

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
alpha-BHC	**0.0713**	**0.0653**	0.103	0.0981	ND	**69**	**67**	50-130	9	15	
gamma-BHC (Lindane)	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
beta-BHC	**0.121**	**0.111**	0.103	0.0981	ND	**118**	**113**	50-130	9	15	
delta-BHC	**0.0461**	**0.0585**	0.103	0.0981	ND	**45**	**60**	50-130	24	15	I,L
Heptachlor	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Aldrin	**NA**	**NA**	0.103	0.0981	2.14	**NA**	**NA**	50-130	NA	15	Z
Heptachlor Epoxide	**NA**	**NA**	0.103	0.0981	0.292	**NA**	**NA**	50-130	NA	15	Z
gamma-Chlordane	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
alpha-Chlordane	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDE	**NA**	**NA**	0.103	0.0981	0.670	**NA**	**NA**	50-130	NA	15	Z
Endosulfan I	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Dieldrin	**NA**	**NA**	0.103	0.0981	0.215	**NA**	**NA**	50-130	NA	15	Z
Endrin	**NA**	**NA**	0.103	0.0981	0.609	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDD	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endosulfan II	**NA**	**NA**	0.103	0.0981	0.271	**NA**	**NA**	50-130	NA	15	Z
4,4'-DDT	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endrin Aldehyde	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Methoxychlor	**NA**	**NA**	0.103	0.0981	ND	**NA**	**NA**	50-130	NA	15	Z
Endosulfan Sulfate	**0.104**	**0.0695**	0.103	0.0981	0.124	**NA**	**NA**	50-130	NA	15	A
Endrin Ketone	**0.0723**	**0.0839**	0.103	0.0981	ND	**70**	**86**	50-130	15	15	
Surrogate:											
TCMX						*55*	*64*	*25-114*			
DCB						*114*	*81*	*30-137*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

ORGANOCHLORINE PESTICIDES EPA 8081B QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
SPIKE BLANKS											
Laboratory ID:	SB0131W2										
	SB	SBD	SB	SBD		SB	SBD				
alpha-BHC	**0.0789**	**0.0816**	0.100	0.100	N/A	**79**	**82**	42-113	3	19	
gamma-BHC (Lindane)	**0.0754**	**0.0785**	0.100	0.100	N/A	**75**	**78**	45-114	4	15	
beta-BHC	**0.0863**	**0.0869**	0.100	0.100	N/A	**86**	**87**	40-118	1	15	
delta-BHC	**0.0880**	**0.0801**	0.100	0.100	N/A	**88**	**80**	20-125	9	15	
Heptachlor	**0.0786**	**0.0739**	0.100	0.100	N/A	**79**	**74**	41-120	6	16	
Aldrin	**0.0742**	**0.0741**	0.100	0.100	N/A	**74**	**74**	35-115	0	15	
Heptachlor Epoxide	**0.0809**	**0.0810**	0.100	0.100	N/A	**81**	**81**	50-118	0	15	
gamma-Chlordane	**0.0783**	**0.0792**	0.100	0.100	N/A	**78**	**79**	46-110	1	15	
alpha-Chlordane	**0.0805**	**0.0807**	0.100	0.100	N/A	**80**	**81**	38-112	0	15	
4,4'-DDE	**0.0926**	**0.0922**	0.100	0.100	N/A	**93**	**92**	41-127	0	15	
Endosulfan I	**0.0901**	**0.0904**	0.100	0.100	N/A	**90**	**90**	45-119	0	15	
Dieldrin	**0.0890**	**0.0897**	0.100	0.100	N/A	**89**	**90**	46-115	1	15	
Endrin	**0.0862**	**0.0852**	0.100	0.100	N/A	**86**	**85**	52-124	1	15	
4,4'-DDD	**0.0885**	**0.0873**	0.100	0.100	N/A	**89**	**87**	52-121	1	15	
Endosulfan II	**0.0849**	**0.0811**	0.100	0.100	N/A	**85**	**81**	44-114	5	15	
4,4'-DDT	**0.0915**	**0.0865**	0.100	0.100	N/A	**91**	**87**	48-123	6	15	
Endrin Aldehyde	**0.0894**	**0.0870**	0.100	0.100	N/A	**89**	**87**	45-114	3	15	
Methoxychlor	**0.0850**	**0.0800**	0.100	0.100	N/A	**85**	**80**	49-130	6	15	
Endosulfan Sulfate	**0.0859**	**0.0849**	0.100	0.100	N/A	**86**	**85**	39-117	1	15	
Endrin Ketone	**0.0823**	**0.0820**	0.100	0.100	N/A	**82**	**82**	53-119	0	15	
Surrogate:											
TCMX						*59*	*58*	*25-114*			
DCB						*98*	*95*	*30-137*			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Arsenic	**6.0**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**110**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**93**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**250**	69	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**290**	69	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**31**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**2.1**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**120**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Arsenic	**4.1**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**130**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0131WM1					
Arsenic	**ND**	3.3	EPA 200.8	1-31-22	2-1-22	
Barium	**ND**	28	EPA 200.8	1-31-22	2-1-22	
Cadmium	**ND**	4.4	EPA 200.8	1-31-22	2-1-22	
Chromium	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Lead	**ND**	1.1	EPA 200.8	1-31-22	2-1-22	
Selenium	**ND**	5.6	EPA 200.8	1-31-22	2-1-22	
Silver	**ND**	11	EPA 200.8	1-31-22	2-1-22	
Laboratory ID:	MB0201W1					
Mercury	**ND**	0.50	EPA 7470A	2-1-22	2-1-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Arsenic	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Barium	**125**	**127**	NA	NA		NA		NA	2	20	
Cadmium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA		NA	NA	20	
Laboratory ID:	01-245-07										
Mercury	**ND**	**ND**	NA	NA		NA		NA	NA	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Arsenic	**113**	**109**	111	111	ND	**102**	**98**	75-125	4	20	
Barium	**237**	**233**	111	111	125	**101**	**97**	75-125	2	20	
Cadmium	**115**	**108**	111	111	ND	**104**	**97**	75-125	6	20	
Chromium	**114**	**108**	111	111	ND	**103**	**97**	75-125	5	20	
Lead	**107**	**103**	111	111	ND	**97**	**93**	75-125	4	20	
Selenium	**109**	**101**	111	111	ND	**98**	**91**	75-125	7	20	
Silver	**110**	**105**	111	111	ND	**99**	**94**	75-125	5	20	
Laboratory ID:	01-245-07										
Mercury	**12.1**	**12.0**	12.5	12.5	ND	**97**	**96**	75-125	0	20	
SPIKE BLANK											
Laboratory ID:	SB0131WM1										
Arsenic	**109**		111		N/A	**98**		85-115			
Barium	**111**		111		N/A	**100**		85-115			
Cadmium	**110**		111		N/A	**99**		85-115			
Chromium	**111**		111		N/A	**100**		85-115			
Lead	**111**		111		N/A	**100**		85-115			
Selenium	**96.0**		111		N/A	**87**		85-115			
Silver	**111**		111		N/A	**100**		85-115			
Laboratory ID:	SB0201W1										
Mercury	**12.1**		12.5		N/A	**96**		80-120			

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*66-117*				
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Benzene	**3.3**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*94*	*66-117*				
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Benzene	**4.3**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*102*	*66-117*				
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Benzene	**ND**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*104*	*66-117*				
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Benzene	**8.6**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*85*	*66-117*				

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Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Benzene	**ND**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*93*	*66-117*				
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Benzene	**14**	4.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*105*	*66-117*				

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

BENZENE
EPA 8021B
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201W2					
Benzene	**ND**	1.0	EPA 8021B	2-1-22	2-1-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*106*	*66-117*				
Laboratory ID:	MB0202W2					
Benzene	**ND**	1.0	EPA 8021B	2-2-22	2-2-22	
Surrogate:	*Percent Recovery*	*Control Limits*				
Fluorobenzene	*92*	*66-117*				

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Benzene	**8.64**	**8.47**	NA	NA		NA		NA	2	30	
Surrogate:											
Fluorobenzene						*85*	*85*	*66-117*			
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Benzene	**59.6**	**56.5**	50.0	50.0	8.64	**102**	**96**	77-114	5	14	
Surrogate:											
Fluorobenzene						*98*	*94*	*66-117*			
SPIKE BLANKS											
Laboratory ID:	SB0201W1										
	SB		SB			SB					
Benzene	**54.4**		50.0			**109**		80-116	NA	NA	
Surrogate:											
Fluorobenzene						*113*		*66-117*			

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

pH
SM 4500-H B

Matrix: Water
Units: pH (@ 25ºC)

Analyte	Result	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**				
Laboratory ID:	01-245-01				
pH	**6.6**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-2-012622**				
Laboratory ID:	01-245-02				
pH	**6.4**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MWD-21-1-012622**				
Laboratory ID:	01-245-03				
pH	**8.2**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-3-012622**				
Laboratory ID:	01-245-04				
pH	**6.9**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-4-012722**				
Laboratory ID:	01-245-05				
pH	**7.2**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-5-012722**				
Laboratory ID:	01-245-06				
pH	**6.6**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-6-012722**				
Laboratory ID:	01-245-07				
pH	**7.1**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-7-012722**				
Laboratory ID:	01-245-08				
pH	**6.8**	SM 4500-H B	1-28-22	1-28-22	
Client ID:	**MW-21-DUP-012722**				
Laboratory ID:	01-245-09				
pH	**7.1**	SM 4500-H B	1-28-22	1-28-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**73**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**36**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**140**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**190**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**52**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Arsenic	**3.7**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**44**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	

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Project: PS21204410.02.****

DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0128F1					
Arsenic	**ND**	3.0	EPA 200.8	1-28-22	1-31-22	
Barium	**ND**	25	EPA 200.8	1-28-22	1-31-22	
Cadmium	**ND**	4.0	EPA 200.8	1-28-22	1-31-22	
Chromium	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Lead	**ND**	1.0	EPA 200.8	1-28-22	1-31-22	
Selenium	**ND**	5.0	EPA 200.8	1-28-22	2-2-22	
Silver	**ND**	10	EPA 200.8	1-28-22	1-31-22	
Laboratory ID:	MB0128F1					
Mercury	**ND**	0.50	EPA 7470A	1-28-22	2-1-22	

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DISSOLVED METALS
EPA 200.8/7470A
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result		Spike Level		Source Result	Percent Recovery	Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE										
Laboratory ID:	01-245-07									
	ORIG	DUP								
Arsenic	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Barium	**52.2**	**52.0**	NA	NA		NA	NA	0	20	
Cadmium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Chromium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Lead	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Selenium	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Silver	**ND**	**ND**	NA	NA		NA	NA	NA	20	
Laboratory ID:	01-245-07									
Mercury	**ND**	**ND**	NA	NA		NA	NA	NA	20	
MATRIX SPIKES										
Laboratory ID:	01-245-07									
	MS	MSD	MS	MSD		MS	MSD			
Arsenic	**92.2**	**92.0**	80.0	80.0	ND	**115**	**115**	75-125	0	20
Barium	**127**	**126**	80.0	80.0	52.2	**93**	**93**	75-125	0	20
Cadmium	**90.0**	**89.4**	80.0	80.0	ND	**113**	**112**	75-125	1	20
Chromium	**73.6**	**73.2**	80.0	80.0	ND	**92**	**92**	75-125	1	20
Lead	**74.8**	**75.0**	80.0	80.0	ND	**94**	**94**	75-125	0	20
Selenium	**96.2**	**94.8**	80.0	80.0	ND	**120**	**119**	75-125	1	20
Silver	**68.8**	**69.2**	80.0	80.0	ND	**86**	**87**	75-125	1	20
Laboratory ID:	01-245-07									
Mercury	**11.8**	**12.2**	12.5	12.5	ND	**95**	**98**	75-125	3	20
SPIKE BLANK										
Laboratory ID:	SB0128F1									
Arsenic	**77.2**		80.0		N/A	**97**	85-115			
Barium	**80.4**		80.0		N/A	**101**	85-115			
Cadmium	**79.0**		80.0		N/A	**99**	85-115			
Chromium	**78.0**		80.0		N/A	**98**	85-115			
Lead	**75.2**		80.0		N/A	**94**	85-115			
Selenium	**70.8**		80.0		N/A	**89**	85-115			
Silver	**79.6**		80.0		N/A	**100**	85-115			
Laboratory ID:	SB0128F1									
Mercury	**12.2**		12.5		N/A	**98**	80-120			

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Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Iron	**17000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Iron	**79000**	280	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Iron	**ND**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Iron	**22000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Iron	**14000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Iron	**9000**	56	EPA 6010D	2-1-22	2-10-11	
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Iron	**17000**	56	EPA 6010D	2-1-22	2-1-11	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Iron	**ND**	56	EPA 6010D	2-1-22	2-10-11	

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Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

TOTAL IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Iron	**16000**	56	EPA 6010D	2-1-22	2-14-11	

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Project: PS21204410.02.****

TOTAL IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0201WM1					
Iron	**ND**	56	EPA 6010D	2-1-22	2-1-11	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Iron	**16900**	**16800**	NA	NA		NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**36600**	**36900**	22200	22200	16900	**88**	**90**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0201WM1										
Iron	**21900**		22200		N/A	**99**		80-120			

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Project: PS21204410.02.****

DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-1-012622**					
Laboratory ID:	01-245-01					
Iron	**4800**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-2-012622**					
Laboratory ID:	01-245-02					
Iron	**32000**	250	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MWD-21-1-012622**					
Laboratory ID:	01-245-03					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-3-012622**					
Laboratory ID:	01-245-04					
Iron	**2200**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-4-012722**					
Laboratory ID:	01-245-05					
Iron	**620**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-5-012722**					
Laboratory ID:	01-245-06					
Iron	**2700**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-6-012722**					
Laboratory ID:	01-245-07					
Iron	**930**	56	EPA 6010D	1-28-22	2-10-22	
Client ID:	**MW-21-7-012722**					
Laboratory ID:	01-245-08					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	

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DISSOLVED IRON
EPA 6010D

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
Client ID:	**MW-21-DUP-012722**					
Laboratory ID:	01-245-09					
Iron	**540**	56	EPA 6010D	1-28-22	2-10-22	

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

Date of Report: February 15, 2022
Samples Submitted: January 28, 2022
Laboratory Reference: 2201-245
Project: PS21204410.02.****

DISSOLVED IRON
EPA 6010D
QUALITY CONTROL

Matrix: Water
Units: ug/L (ppb)

Analyte	Result	PQL	Method	Date Prepared	Date Analyzed	Flags
METHOD BLANK						
Laboratory ID:	MB0128F1					
Iron	**ND**	56	EPA 6010D	1-28-22	2-10-22	

Analyte	Result		Spike Level		Source Result	Percent Recovery		Recovery Limits	RPD	RPD Limit	Flags
DUPLICATE											
Laboratory ID:	01-245-07										
	ORIG	DUP									
Iron	**930**	**918**	NA	NA		NA		NA	1	20	
MATRIX SPIKES											
Laboratory ID:	01-245-07										
	MS	MSD	MS	MSD		MS	MSD				
Iron	**22600**	**22800**	22200	22200	930	**98**	**99**	75-125	1	20	
SPIKE BLANK											
Laboratory ID:	SB0128F1										
Iron	**22000**		22200		N/A	**99**		80-120			

This report pertains to the samples analyzed in accordance with the chain of custody,
and is intended only for the use of the individual or company to whom it is addressed.

OnSite Environmental Inc.

Data Qualifiers and Abbreviations

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

E - The value reported exceeds the quantitation range and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeneity. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range are impacting the diesel range result.

M1 - Hydrocarbons in the gasoline range (toluene-naphthalene) are present in the sample.

N - Hydrocarbons in the lube oil range are impacting the diesel range result.

N1 - Hydrocarbons in diesel range are impacting lube oil range results.

O - Hydrocarbons indicative of heavier fuels are present in the sample and are impacting the gasoline result.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

U1 - The practical quantitation limit is elevated due to interferences present in the sample.

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a mercury cleanup procedure.

X1- Sample extract treated with a sulfuric acid/silica gel cleanup procedure.

Y - The calibration verification for this analyte exceeded the 20% drift specified in methods 8260 & 8270, and therefore the reported result should be considered an estimate. The overall performance of the calibration verification standard met the acceptance criteria of the method.

Y1 - Negative effects of the matrix from this sample on the instrument caused values for this analyte in the bracketing continuing calibration verification standard (CCVs) to be outside of 20% acceptance criteria. Because of this, quantitation limits and sample concentrations should be considered estimates.

Z - Sample contained high levels of interferences that rendered this analyte unquantifiable.

ND - Not Detected at PQL
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

This report pertains to the samples analyzed in accordance with the chain of custody, and is intended only for the use of the individual or company to whom it is addressed.

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664

Professional Analytical Services

Feb 4 2022
On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister

Dear David Baumeister:

Enclosed please find the analytical data for your project.

The following is a cross correlation of client and laboratory identifications for your convenience.

CLIENT ID	MATRIX	AMTEST ID	TEST
MW-21-1-012622	Water	22-A001385	CONV
MW-21-2-012622	Water	22-A001386	CONV
MWD-21-1-012622	Water	22-A001387	CONV
MW-21-3-012622	Water	22-A001388	CONV
MW-21-4-012622	Water	22-A001389	CONV
MW-21-5-012622	Water	22-A001390	CONV
MW-21-6-012622	Water	22-A001391	CONV
MW-21-7-012622	Water	22-A001392	CONV
MW-21-DUP-012622	Water	22-A001393	CONV

Your samples were received on Monday, January 31, 2022. At the time of receipt, the samples were logged in and properly maintained prior to the subsequent analysis.

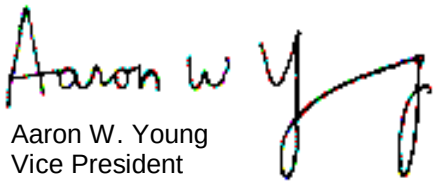
The analytical procedures used at AmTest are well documented and are typically derived from the protocols of the EPA, USDA, FDA or the Army Corps of Engineers.

Following the analytical data you will find the Quality Control (QC) results.

Please note that the detection limits that are listed in the body of the report refer to the Practical Quantitation Limits (PQL's), as opposed to the Method Detection Limits (MDL's).

If you should have any questions pertaining to the data package, please feel free to contact me.

Sincerely,



Aaron W. Young
Vice President

Project #: PS21204410.02.*
SDG #: 2222590
PO Number: 01-245

BACT = Bacteriological
CONV = Conventionals
MET = Metals
ORG = Organics
NUT=Nutrients
DEM=Demand
MIN=Minerals

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

ANALYSIS REPORT

On-Site Environmental
14648 NE 95th ST
Redmond, WA 98052
Attention: David Baumeister
SDG Number: 2222590
Project #: PS21204410.02.*
PO Number: 01-245
All results reported on an as received basis.

Date Received: 01/31/22
Date Reported: 2/ 4/22

AMTEST Identification Number **22-A001385**
Client Identification **MW-21-1-012622**
Sampling Date **01/26/22, 12:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	2000	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.95	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001386**
Client Identification **MW-21-2-012622**
Sampling Date **01/26/22, 13:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	590	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.27	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001387**
Client Identification **MWD-21-1-012622**
Sampling Date **01/26/22, 14:20**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	540	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.25	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001388**
Client Identification **MW-21-3-012622**
Sampling Date **01/26/22, 15:43**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	610	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.28	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001389**
Client Identification **MW-21-4-012622**
Sampling Date **01/27/22, 10:15**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	630	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.29	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001390**
Client Identification **MW-21-5-012622**
Sampling Date **01/27/22, 11:37**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	330	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.15	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001391**
Client Identification **MW-21-6-012622**
Sampling Date **01/27/22, 13:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	510	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001392**
Client Identification **MW-21-7-012622**
Sampling Date **01/27/22, 14:38**

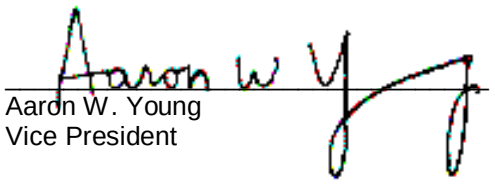
Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	520	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22

AMTEST Identification Number **22-A001393**
Client Identification **MW-21-DUP-012622**
Sampling Date **01/27/22, 13:12**

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Conductivity	520	umhos/cm		0.5	SM 2510B	KF	02/01/22
Salinity	0.24	g/kg		0.05	SM 2520B	KF	02/01/22



Aaron W. Young
Vice President

Am Test Inc.
13600 NE 126th PL
Suite C
Kirkland, WA, 98034
(425) 885-1664
www.amtestlab.com

Professional Analytical Services

QC Summary for sample numbers: 22-A001385 to 22-A001393

DUPLICATES

SAMPLE #	ANALYTE	UNITS	SAMPLE VALUE	DUP VALUE	RPD
22-A001441	Conductivity	umhos/cm	64.	64.	0.00
22-A001445	Conductivity	umhos/cm	310	310	0.00
22-A001391	Conductivity	umhos/cm	510	510	0.00
22-a001391	Salinity	g/kg	0.24	0.24	0.00

STANDARD REFERENCE MATERIALS

ANALYTE	UNITS	TRUE VALUE	MEASURED VALUE	RECOVERY
Conductivity	umhos/cm	200	200	100. %
Conductivity	umhos/cm	200	210	105. %
Conductivity	umhos/cm	200	200	100. %
Salinity	g/kg	0.10	0.10	100. %

BLANKS

ANALYTE	UNITS	RESULT
Conductivity	umhos/cm	< 0.5
Conductivity	umhos/cm	< 0.5
Conductivity	umhos/cm	< 0.5
Salinity	g/kg	< 0.05

OnSite Environmental Inc.

14648 NE 95th Street, Redmond, WA 98052 · (425) 883-3881

Laboratory Reference #: 01-245

Laboratory: AmTest Laboratories

Attention: Aaron Young

13600 NE 126th Pl Kirkland, WA 98034

Phone Number: (425) 885-1664

Turnaround Request

1 Day 2 Day 3 Day

Standard

Other: _____

Project Manager: David Baumeister

email: dbaumeister@onsite-env.com

Project Number: PS21204410.02.****

Project Name: _____

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	Requested Analyses
85	MW-21-1-012622	1/26/22	12:12	W	1	Salinity SM 2520D
86	MW-21-2-012622	1/26/22	13:20	W	1	Salinity SM 2520D
87	MWD-21-1-012622	1/26/22	14:20	W	1	Salinity SM 2520D
88	MW-21-3-012622	1/26/22	15:43	W	1	Salinity SM 2520D
89	MW-21-4-012622	1/27/22	10:15	W	1	Salinity SM 2520D
90	MW-21-5-012622	1/27/22	11:37	W	1	Salinity SM 2520D
91	MW-21-6-012622	1/27/22	13:12	W	1	Salinity SM 2520D (Client QA/QC)
92	MW-21-7-012622	1/27/22	14:38	W	1	Salinity SM 2520D
93	MW-21-DUP-012622	1/27/22	13:12	W	1	Salinity SM 2520D

	Company	Date	Time	Comments/Special Instructions
Relinquished by:	OSE	1/31/22	1220	EIM
Received by:	AmTest	1/31/22	1220	
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

13

P.7

5.4°C

Chain of Custody

Page 1 of 1

OnSite Environmental Inc.
Analytical Laboratory Testing Services
14648 NE 95th Street • Redmond, WA 98052
Phone: (425) 883-3881 • www.onsite-env.com

Laboratory Number: 01-245

Company: Wood E&I
Project Number: 8# PS21204410.02.****
Project Name: Skagit County (Whitmarsh) Landfill
Project Manager: Koorus Taghighi
Sampled by: Cheyenne G. & Cherie H.

Turnaround Request (in working days)
(Check One)
☐ Same Day ☐ 1 Day
☐ 2 Days ☐ 3 Days
☒ Standard (7 Days)
☐ _____ (other)

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	Number of Containers
1	MW-21-1-01 26 22	1/26/22	1212	W	9
2	MW-21-2-01 26 22		1320		9
3	MW-21-1-01 26 22		1420		9
4	MW-21-3-01 26 22		1543		9
5	MW-21-4-01 27 22	1/27/22	1015		9
6	MW-21-5-01 27 22		1137		9
7	MW-21-6-01 27 22		1312		17
8	MW-21-7-01 27 22		1435		9
9	MW-21-DUP-01 27 22		1312		9

Lab ID	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Gx	NWTPH-Dx (☐ Acid / SG Clean-up)	Volatiles 8260D	Halogenated Volatiles 8260D	EDB EPA 8011 (Waters Only)	Semivolatiles 8270E/SIM (with low-level PAHs)	PAHs 8270E/SIM (low-level)	PCBs 8082A	Organochlorine Pesticides 8081B	Organophosphorus Pesticides 8270E/SIM	Chlorinated Acid Herbicides 8151A	Total RCRA Metals	~~Total MTCA Metals~~ TOTAL IRON	~~TCLP Metals~~ DISSOLVED IRON	HEM (oil and grease) 1664A	Benzene EPA 8021B	Salinity + pH	Dissolved RCRA *	Metals EPA 200.8 / 7470A	% Moisture
1															X	X						
2															X	X						
3															X	X						
4															X	X						
5															X	X						
6															X	X						
7															X	X						
8															X	X						
9															X	X						

client QA/QC

X

	Signature	Company	Date	Time
Relinquished	Cheyenne Ginther	Wood E&I	1/28/22	1130
Received		CDE	1/28/22	1130
Relinquished				
Received				
Relinquished				
Received				
Reviewed/Date		Reviewed/Date		

Comments/Special Instructions
*lab filter
Call Koorus Taghighi 206-641-6301 if any questions
(Added 2/9/22. DB (STA))

Data Package: Standard ☐ Level III ☐ Level IV ☐

Chromatograms with final report ☐ Electronic Data Deliverables (EDDs) ☐

Memo

To:	Koorus Tahghighi, Project Manager	Project:	PS21204410.02
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	February 25, 2022		

Subject: Summary Data Quality Review
Whitmarsh Landfill Groundwater Sampling
OnSite Laboratory Reference: 2110-289 and 2201-245

This memo presents the summary data quality review of eight primary groundwater samples and one groundwater field duplicate sample collected on October 27 and 28, 2021, as well as eight primary groundwater samples and one groundwater field duplicate sample collected on January 26 and 27, 2022. The samples were submitted to OnSite Environmental Inc. (OnSite), located in Redmond, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for the following:

- Semivolatile organic compounds (SVOCs) by U.S. Environmental Protection Agency (EPA) Method 8270E with selected ion monitoring;
- Benzene by EPA Method 8021B;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082A;
- Organochlorine pesticides by EPA Method 8021B;
- Total and dissolved metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by EPA Methods 200.8 and 7470A;
- Total and dissolved iron by EPA Method 6010D;
- pH by Standard Method (SM) 4500-H B;
- Conductivity by SM 2510B; and
- Salinity by SM 2520B.

The samples and the analyses conducted on the samples are listed below.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Sample ID	OnSite Laboratory Sample ID	Requested Analyses
October 2021 Samples – Work Order No. 2110-289		
MW-21-1-102721	10-289-01 / 21-A016741	All
MW-21-2-102821	10-289-02 / 21-A016742	All
MWD-21-1-102821	10-289-03 / 21-A016743	All
MW-21-3-102821	10-289-04 / 21-A016744	All
MW-21-4-102821	10-289-05 / 21-A016745	All
MW-21-5-102821	10-289-06 / 21-A016746	All
MW-21-6-102821	10-289-07 / 21-A016747	All
MW-21-7-102821	10-289-08 / 21-A016748	All
DUP-1-102821	10-289-09 / 21-A016749	All
January 2022 Samples – Work Order No. 2201-245		
MW-21-1-012622	01-245-01 / 22-A001385	All
MW-21-2-012622	01-245-02 / 22-A001386	All
MWD-21-1-012622	01-245-03 / 22-A001387	All
MW-21-3-012622	01-245-04 / 22-A001388	All
MW-21-4-012622	22-A001389	Conductivity and salinity
MW-21-4-012722	01-245-05	All except conductivity and salinity
MW-21-5-012622	22-A001390	Conductivity and salinity
MW-21-5-012722	01-245-06	All except conductivity and salinity
MW-21-6-012622	22-A001391	Conductivity and salinity
MW-21-6-012722	01-245-07	All except conductivity and salinity
MW-21-7-012622	22-A001392	Conductivity and salinity
MW-21-7-012722	01-245-08	All except conductivity and salinity
MW-21-DUP-012622	22-A001393	Conductivity and salinity
MW-21-DUP-012722	01-245-09	All except conductivity and salinity

Data were reviewed in accordance with the appropriate procedures and criteria per the method documention. The most current control limits provided by the laboratory were used to evaluate the quality control data.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014a and b).

OnSite received the samples on October 29, 2021, and January 28, 2022. The temperatures of the coolers were recorded upon receipt and were below the maximum acceptable temperature of 6 degrees Celsius.

Organic analyses

Samples were analyzed for SVOCs and benzene. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable as noted:

   For the October 2021 samples, 4-nitrophenol was recovered above the 23–64 percent control limits in the LCS and LCSD. There were no detections of 4-nitrophenol in the associated samples, and the high bias had no effect on the data.

5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was above recovery limits for pentachlorophenol in the MSD, and the concentration in the unspiked native sample was less than four times the amount of spike added. Associated sample MW-21-6-012722 should be flagged with a "J" when reporting to indicate the value is an estimate.

6. Field Duplicates – Acceptable as noted:

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate relative percent differences (RPDs) is 30 percent for concentrations greater than five times the reporting limit. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC." In these cases, the absolute value of the difference between the primary and duplicate result should not exceed the value of the reporting limit. The analytes listed in the table below for the October 2021 samples were detected in the duplicate sample, but not the primary sample. These results should be flagged with a "J" for detected and "UJ" for non-detects when reporting to indicate the value is an estimate. The field duplicate RPDs for the January 2022 samples were within the control limits, with the exception of naphthalene, 2-mehtylnaphthalene, 1-methylnaphthalene, acenaphthene, and benzene. The RPD for the results of these analytes exceeded the RPD and should be flagged with a "J" when reporting to indicate the value is an estimate.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	PQL[1] (µg/L)	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	Benzo[a]anthracene	ND	0.011	0.0096/0.010	NC
	Chrysene	ND	0.021	0.0096/0.010	NC
	Benzo[b]fluoranthene	ND	0.016	0.0096/0.010	NC
	Benzo[a]pyrene	ND	0.012	0.0096/0.010	NC
	Benzo[g,h,i]perylene	ND	0.011	0.0096/0.010	NC
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	(o-Cresol)	51	60	20/21	16
	(m,p-Cresol)	56	70	20/21	22
	2,4-Dimethylphenol	470	590	20/21	23
	Naphthalene	4.9	9.5	1.0/1.0	64
	2-Methylnaphthalene	3.7	6.6	1.0/1.0	56
	1-Methylnaphthalene	3.5	5.4	1.0/1.0	43
	2,4,5-Trichlorophenol	2.3	3.2	1.0/1.0	NC
	Acenaphthene	0.43	0.68	0.10/0.10	45
	Fluorene	1.0	1.3	1.0/1.0	NC
	Pentachlorophenol	21	26	5.1/5.1	21
	Phenanthrene	0.33	0.35	0.10/0.10	NC
	Benzene	8.6	14	1.0/4.0	48

Note:
1. The first number in the PQL column is the PQL for the primary sample, the second is the PQL for the duplicate sample.

Abbreviations:
µg/L = micrograms per liter
NC = not calculated
PQL = practical quantitation limit
RPD = relative percent difference

7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For the January 2022 samples, the reporting limits for numerous SVOCs were elevated due to interfences present in the sample. The U1 on the laboratory results should be converted to a "UJ" flag for reporting purposes.

Polychlorinated Biphenyl Analysis

Samples were analyzed for PCB Aroclors. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was below control limits for Aroclor 1260 in the MS and MSD, and the concentration in the unspiked native sample was less than four times the amount of spike added. Associated sample MW-21-6-012722 should be flagged with a "UJ" when reporting to indicate the value is an estimate.
6. Field Duplicates – Acceptable as noted:

   For both sample events, all Aroclors were below detection limits for both the parent and duplicate sample. The RPD is not calculated for non-detect results. The field duplicate is assumed to be within control limits and results are not flagged for use.
7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For both sample events, reporting limits for numerous Aroclors were elevated due to interfences present in the sample. The U1 on the laboratory results should be converted to a "UJ" flag for reporting purposes.

Pesticides Analysis

Samples were analyzed for organochlorine pesticides. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable as noted:

   For the October 2021 samples, surrogates were below control limits for samples MW-21-5-102821 and MW-21-6-102821 due to the high dilution necessary to analyze the sample.

   For the January 2022 samples, surrogates were below control limits for samples MW-21-5-012722, MW-21-6-012722, and MW-21-DUP-012722, due to the high dilution necessary to analyze the sample.

   Wood does not assess surrogate recoveries for samples that were analyzed at a dilution higher than 1:5.
4. LCS – Acceptable

5. MS/MSD – Acceptable as noted:

   For the January 2022 samples, percent recovery was below control limits for multiple analytes in the MS. This is likely due to the high dilution necessary to analyze the sample and results are not flagged for use.

6. Laboratory Duplicates – Acceptable

7. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit.

   For the October 2021 samples, all analytes were below detection limits for both the primary and duplicate sample, except aldrin in the primary sample. The RPD is not calculated for non-detect results. The difference between the reporting limit for the two results is 0.0001 µg/L with the detection just above the reporting limit. These results are not qualified for use.

   For the January 2022 samples, the field duplicate RPDs were within the control limits.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	PQL[1] (µg/L)	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	Aldrin	0.0022	ND	0.0021/0.0020	NC
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	Aldrin	2.1	2.5	0.041/0.042	17
	Heptachlor Epoxide	0.29	0.34	0.062/0.063	16
	4,4'-DDE	0.67	0.68	0.10/0.11	1
	Dieldrin	0.22	0.26	0.10/0.11	NC
	Endrin	0.61	0.63	0.10/0.11	3
	Endosulfan II	0.27	0.23	0.10/0.11	NC
	Endosulfan Sulfate	0.12	0.13	0.10/0.11	NC

Note:
1. The first number in the PQL column is the PQL for the primary sample, the second is the PQL for the duplicate sample.

Abbreviations:
µg/L = micrograms per liter
4,4'-DDE = 4,4'-dichlorodiphenyldichloroethylene
NC = not calculated
PQL = practical quantitation limit
RPD = relative percent difference

8. Reporting Limits and Laboratory Flags – Acceptable as noted:

   For both October 2021 and January 2022 samples, the RPDs for detected concentrations between the two columns were greater than 40 percent in numerous pesticides. The "P" on the laboratory results should be changed to a "J" flag for reporting purposes.

Inorganic analyses

Samples were analyzed for total and dissolved metals, pH, conductivity, and salinity. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS – Acceptable
4. MS/MSD – Acceptable
5. Laboratory Duplicates – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during both sampling events, meeting the project frequency requirement of five percent, or one for every 20 samples. Detected primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit. The field duplicate RPDs were within the control limits with the exception of total iron in October 2021 and dissolved iron in January 2022; these results should be flagged with a "J" when reporting to indicate the results are an estimate.

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	PQL	RPD (%)
October 2021 Samples – Work Order No. 2110-289					
MW-21-7-102821/ DUP-1-102821	pH	7.0 SU	6.9 SU	NA	1.4
	Arsenic (total)	4.1 µg/L	3.8 µg/L	3.3 µg/L	7.6
	Arsenic (dissolved)	3.5 µg/L	3.5 µg/L	3.0 µg/L	0
	Iron (total)	900 µg/L	630 µg/L	50 µg/L	35
	Iron (dissolved)	ND	ND	56 µg/L	NC
	Salinity	0.24 g/kg	0.24 g/kg	0.05 g/kg[1]	0
January 2022 Samples – Work Order No. 2201-245					
MW-21-6-012722/ MW-21-DUP-012722	pH	7.1 SU	7.1 SU	NA	0
	Barium (total)	120 µg/L	130 µg/L	28	8
	Barium (dissolved)	52 µg/L	44 µg/L	25	17
	Iron (total)	17,000	16,000	56	6
	Iron (dissolved)	930	540	56	53
MW-21-6-012622/ MW-21-DUP-012622	Conductivity	510 µmhos/cm	520 µmhos/cm	0.5[1]	1.9
	Salinity	0.24 g/kg	0.24 g/kg	0.05[1]	0

Note:
1. Salinity and conductivity have detection limits rather than PQLs.

Abbreviations:
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter
g/kg = grams per kilogram
NA = not applicable
ND = not detected
PQL = practical quantitation limit
RPD = relative percent difference
SU = Standard Units

7. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order numbers 2110-289 and 2201-245 is 100 percent. The usefulness of these data was evaluated based on the EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
October 2021 Samples – Work Order No. 2110-289				
MW-21-2-102821	n-Nitrosodiphenylamine	Elevated PQL	1.8 µg/L	UJ
MW-21-4-102821	PCB-Aroclor 1016	Elevated PQL	0.25 µg/L	UJ
	PCB-Aroclor 1221		0.25 µg/L	
	PCB-Aroclor 1232		0.25 µg/L	
	PCB-Aroclor 1242		0.25 µg/L	
	PCB-Aroclor 1248		5.0 µg/L	
	PCB-Aroclor 1254		0.25 µg/L	
	PCB-Aroclor 1260		0.050 µg/L	
	Aldrin	Dual column RPD > 40%	0.33 µg/L	J
	4,4'-DDE		0.23 µg/L	
	Endosulfan I		0.052 µg/L	
	4,4'-DDT		0.010 µg/L	
	Methoxychlor		0.014 µg/L	
MW-21-5-102821	Acenaphthene	Elevated PQL	0.21 µg/L	UJ
	PCB-Aroclor 1016	Elevated PQL	0.96 µg/L	UJ
	PCB-Aroclor 1221		0.96 µg/L	
	PCB-Aroclor 1232		0.96 µg/L	
	PCB-Aroclor 1242		0.96 µg/L	
	PCB-Aroclor 1248		4.8 µg/L	
	PCB-Aroclor 1254		0.96 µg/L	
	PCB-Aroclor 1260		0.048 µg/L	
	Aldrin	Dual column RPD > 40%	0.22 µg/L	J
	Heptachlor Epoxide		0.14 µg/L	
	Endosulfan I		0.21 µg/L	
	Dieldrin		0.086 µg/L	
	Endrin Aldehyde		0.19 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-6-102821	Flouranthene	Elevated PQL	0.62 µg/L	UJ
	PCB-Aroclor 1016	Elevated PQL	0.25 µg/L	UJ
	PCB-Aroclor 1221		0.25 µg/L	
	PCB-Aroclor 1232		0.25 µg/L	
	PCB-Aroclor 1242		0.25 µg/L	
	PCB-Aroclor 1248		5.0 µg/L	
	PCB-Aroclor 1254		0.25 µg/L	
	PCB-Aroclor 1260		0.050 µg/L	
	gamma-BHC (Lindane)	Dual column RPD > 40%	0.069 µg/L	J
	beta-BHC		0.10 µg/L	
	Heptachlor		0.054 µg/L	
	Aldrin		3.2 µg/L	
	Heptachlor Epoxide		0.37 µg/L	
	gamma-Chlordane		1.1 µg/L	
	alpha-Chlordane		0.28 µg/L	
	4,4'-DDE		0.32 µg/L	
	Endosulfan I		0.44 µg/L	
	Endosulfan Sulfate		0.060 µg/L	
MW-21-7-102821	Benz[a]anthracene	Absolute value difference > PQL	0.0096 µg/L	UJ
	Chrysene		0.0096 µg/L	
	Benzo(b)fluoranthene		0.0096 µg/L	
	Benzo(a)pyrene		0.0096 µg/L	
	Benzo(ghi)perylene		0.0096 µg/L	
	Iron (total)	Field Dup RPD > 30%	900 µg/L	J
	Aldrin	Dual column RPD > 40%	0.0022 µg/L	J
DUP-1-102821	Benz[a]anthracene	Absolute value difference > PQL	0.011 µg/L	J
	Chrysene		0.021 µg/L	
	Benzo(b)fluoranthene		0.016 µg/L	
	Benzo(a)pyrene		0.012 µg/L	
	Benzo(ghi)perylene		0.011 µg/L	
	Iron (total)	Field Dup RPD > 30%	630 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
January 2022 Samples – Work Order No. 2201-245				
MW-21-2-012622	delta-BHC	Dual column RPD > 40%	0.0061 µg/L	J
	Endosulfan Sulfate		0.0074 µg/L	
MW-21-4-012722	Aldrin	Dual column RPD > 40%	0.43 µg/L	J
	Heptachlor Epoxide		0.089 µg/L	
	Endrin		0.061 µg/L	
	Endosulfan II		0.048 µg/L	
	4,4'-DDT		0.014 µg/L	
	PCB-Aroclor 1016	Elevated PQL	5.6 µg/L	UJ
	PCB-Aroclor 1221		5.6 µg/L	
	PCB-Aroclor 1232		5.6 µg/L	
	PCB-Aroclor 1242		5.6 µg/L	
	PCB-Aroclor 1248		5.6 µg/L	
	PCB-Aroclor 1254		0.56 µg/L	
MW-21-5-012722	Fluoranthene	Elevated PQL	0.19 µg/L	UJ
	Benz[a]anthracene		0.015 µg/L	
	PCB-Aroclor 1016		4.9 µg/L	
	PCB-Aroclor 1221		4.9 µg/L	
	PCB-Aroclor 1232		4.9 µg/L	
	PCB-Aroclor 1242		4.9 µg/L	
	PCB-Aroclor 1248		4.9 µg/L	
	PCB-Aroclor 1254		0.49 µg/L	
	Aldrin	Dual column RPD > 40%	0.68 µg/L	J
	Heptachlor Epoxide		0.093 µg/L	
	4,4'-DDE		0.49 µg/L	
	Dieldrin		0.086 µg/L	
	Endrin		0.34 µg/L	
	Endosulfan II		0.27 µg/L	
	Methoxychlor		0.11 µg/L	

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-6-012722	2,3,4,6-Tetrachlorophenol	Elevated PQL	1.3 µg/L	UJ
	Fluoranthene		0.23 µg/L	
	Benz[a]anthracene		0.014 µg/L	
	PCB-Aroclor 1016		5.2 µg/L	
	PCB-Aroclor 1221		5.2 µg/L	
	PCB-Aroclor 1232		5.2 µg/L	
	PCB-Aroclor 1242		5.2 µg/L	
	PCB-Aroclor 1248		5.2 µg/L	
	PCB-Aroclor 1254		0.52 µg/L	
	PCB-Aroclor 1260	MS/MSD low	0.052 µg/L	UJ
	Heptachlor	Elevated PQL	1.0 µg/L	UJ
	Aldrin	Dual column RPD > 40%	2.1 µg/L	J
	Heptachlor Epoxide		0.29 µg/L	
	4,4'-DDE		0.67 µg/L	
	Dieldrin		0.22 µg/L	
	Endosulfan II		0.27 µg/L	
	Naphthalene	Field Dup RPD > 30%	4.9 µg/L	J
	2-Methylnaphthalene		3.7 µg/L	
	1-Methylnaphthalene		3.5 µg/L	
	Acenaphthene		0.43 µg/L	
	Benzene		8.6 µg/L	
	Pentachlorophenol	MSD high	21 µg/L	J
	Iron (dissolved)	Field Dup RPD > 30%	930 µg/L	J
MW-21-7-012722	beta-BHC	Dual column RPD > 40%	0.0061 µg/L	J

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result	Data Qualifier[1]
MW-21-DUP-012722	Acenaphthylene	Elevated PQL	0.12 µg/L	UJ
	2,3,4,6-Tetrachlorophenol		1.6 µg/L	
	Fluoranthene		0.29 µg/L	
	PCB-Aroclor 1016		5.3 µg/L	
	PCB-Aroclor 1221		5.3 µg/L	
	PCB-Aroclor 1232		5.3 µg/L	
	PCB-Aroclor 1242		5.3 µg/L	
	PCB-Aroclor 1248		5.3 µg/L	
	PCB-Aroclor 1254		0.53 µg/L	
	Aldrin	Dual column RPD > 40%	2.5 µg/L	J
	Heptachlor Epoxide		0.34 µg/L	
	4,4'-DDE		0.68 µg/L	
	Dieldrin		0.26 µg/L	
	Endosulfan II		0.23 µg/L	
	4,4'-DDT		0.17 µg/L	
	Endrin Aldehyde		0.11 µg/L	
	Endosulfan Sulfate		0.13 µg/L	
	Naphthalene	Field Dup RPD > 30%	9.5 µg/L	J
	2-Methylnaphthalene		6.6 µg/L	
	1-Methylnaphthalene		5.4 µg/L	
	Acenaphthene		0.68 µg/L	
	Benzene		14 µg/L	
	Iron (dissolved)		540 µg/L	

Notes:
1. Data qualifiers are as follows:
J = The value is an estimate.
UJ = The analyte was not detected at the estimated reporting limit indicated.

Abbreviations:
µg/L = micrograms per liter
Dup = duplicate
MS/MSD = matrix spike/matrix spike duplicate
PCB = polychlorinated biphenyl
PQL = practical quantitation limit
RPD = relative percent difference

References

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

C:\Users\kellie.mcbee\Documents\Whitmarsh GW 2110-289 and 2201-245 DV Memo kkm.docx

CALCULATIONS

Date:	20-Apr-25	**Made by:**	EAT
Project No.:	US0041081.0037	**Checked by:**	NTS
Subject:	Equipment Calculations	**Reviewed by:**	EJW (1/2/2026)
Project Short Title:	Whitmarsh Landfill Remediation - Temporary Groundwater Treatment	Page 1 of 1	

0.1 Process Assumptions

			Entered Engineer Value	
Maximum Inlet Flow Rate	gpm	Contractor Estimate	200	
Influent Iron	mg/L	From Analytical Data	85	Maximum detected value
Settling Tank Retention Time	min	Assumed, typical range, WSP experienc	120	Additional retention should be provided for solids settling
Aeration Tank Retention Time	min		30	
Settling/Co Precipitation Tank Retention Time	min		180	0.15-1.5 hour typical for iron, additional space provided to allow space for settled solids
Adsorptive Media EBCT Requirements	min	Supplier Recommendation	10	
CESF Sizing	-	4x48" pods		
CESF Backwash Flow	gpm	30% forward flow	60	
CESF Backwash Time	min	4 minutes per pod	16	

Key: BOD = biochemical oxygen demand
CESF = Chitosan Enhanced Sand Filtration
cfm = cubic feet per minute
EBCT = empty bed contact time
ft = feet
GAC = granular activated carbon
gal = gallon
gpm = gallons per minute
lb = pound
mg/L = mmiligram per liter

1.1 Settling Tank Total Retention Time

Flow rate	=	200	gpm							
	=	**200**	**gpm**							
Working volume	=	200	gpm	x	120	min				
	=	**24,000**	**gal**							
		3208.6	ft^3							

1.2 Aeration Tanks Total Retention Time

Flow rate	=	200	gpm									
	=	**200**	**gpm**									
Working volume	=	200	gpm	x	30	min	+	60	gpm	x	16	min
	=	**6,960**	**gal**					960				
		930.5	ft^3					86400				

1.3 Settling/Co-precipitation Tanks Total Retention Time

Flow rate	=	200	gpm							
	=	**200**	**gpm**							
Working volume	=	200	gpm	x	180	min				
	=	**36,000**	**gal**							
		4812.8	ft^3							

2.1 Adsorptive Media Sizing (HS-MT, HS-250-AC)

lbs of HS-MT, HS-250 (50/50 blend)	lbs	15000	Standard GAC column sizes to for hydraulic flow of 200 gpm at EBCT below 10
lbs of HS-MT, HS-250 (50/50 blend)	lbs	30000	GAC Column size that can meet 200gpm requirents for higher EBCT requirements
1 gal water	lbs	8.34	
Apparent Density HS/MT		0.80	
Required EBCT HS/MT	min	10	minimum*
Apparent Density HS-250-AC		0.71	
Required EBCT HS/MT	min	10	minimum*
Apparent Density HS-MT, HS-250-AC (50/50 blend)		0.76	
Apparent Density GAC		0.54	
lbs of GAC per Vessel	lbs	10000	Standard GAC vessel size (by nominal weight) for hydraulic flow of 200 gpm
lbs of HS-MT per Vessel	lbs	7011	Standard GAC vessel size (by nominal weight) for hydraulic flow of 200 gpm, adjusted for change in media density
lbs of HS-250-AC per Vessel	lbs	7011	Standard GAC vessel size (by nominal weight) for hydraulic flow of 200 gpm, adjusted for change in media density
lbs of HS-MT, HS-250-AC (50/50 blend)	lbs	14022	Standard GAC vessel size (by nominal weight) for hydraulic flow of 200 gpm, adjusted for change in media density

Key: BOD = biochemical oxygen demand
CESF = Chitosan Enhanced Sand Filtration
cfm = cubic feet per minute
EBCT = empty bed contact time
ft = feet
GAC = granular activated carbon
gal = gallon
gpm = gallons per minute
lb = pound
mg/L = mmiligram per liter

* Per Supplier (Hydrosil), since the HS-250-AC and HS-MT are treating differing contaminants of concern, volume requirements should be evaluated separately

Evaluate 1 Media Vessel for EBCT

Volume of HS-MT Media per Vessel = $\frac{7{,}011 \text{ lbs}}{1} \times \frac{1}{0.80 \text{ Density Media}} \times \frac{1 \text{ gal}}{8.34 \text{ lbs}}$

CALCULATIONS

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= **1049 gal**

EBCT = 1049 gal / 200 gal x 1 min = **5.2 minutes** Insuffienct to meet required EBCT

Volume of HS-250-AC Media per Vessel = 7,011 lbs / 1 x 1 / 0.71 Density Media x 1 gal / 8.34 lbs

= **1179 gal**

EBCT = 1179 gal / 200 gal x 1 min = **5.9 minutes** Insuffienct to meet required EBCT

Evaluate 2 Media Vessels for EBCT

Volume of HS-MT Media per 2 Vessels = 14,022 lbs / 1 x 1 / 0.80 Density Media x 1 gal / 8.34 lbs

= **2098 gal**

EBCT = 2098 gal / 200 gal x 1 min = **10.5 minutes** Suffienct to meet required EBCT

Volume of HS-250-AC Media per 2 Vessels = 14,022 lbs / 1 x 1 / 0.71 Density Media x 1 gal / 8.34 lbs

= **2358 gal**

EBCT = 2358 gal / 200 gal x 1 min = **11.8 minutes** Suffienct to meet required EBCT

Can use 2 x nominal 10,000 lb GAC vessels (actual media weight 14,000 lb) in series to meet the EBCT requirements and a third vessel to serve as a lag vessel

Verify Recommended Flow Rate Range

Typical 10,000 lb GAC vessel diameter =	8 ft	8 ft D
Cross-Sectional Area =	50 ft2	ft2 A
Recommended Hydraulic Maximum Hydraulic Loading Rate =	10 gpm/ft2	
Recommended Hydraulic Minimum Hydraulic Loading Rate =	2 gpm/ft2	
Hydraulic Loading Rate at maximum system flow rate = 200 gpm / 50 ft2 =	200 gpm	4.0 gpm/ft2

Proposed vessel diameter meets hydraulic loading rate for maximum system flow rate.

Minimum System Flow for GAC Vessel =	101 gpm	2 gpm/ft2
Maximum System Flow for GAC Vessel =	503 gpm	10 gpm/ft2

CALCULATIONS

Date:	20-Apr-25	**Made by:**	EAT
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3.1 Preliminary Aeration Sizing

Influent flow 200 gpm
Water Temperature 20 deg. Celsius
Removal of Iron

Oxygen required=Xt*(Fe)+Xm*(Mn) + R

Xt	0.1432	Iron Reaction Factor
Fe	85	Iron Concentration. Mg/L
Xm	0.2912	Manganese Reaction Factor
Mn	0	effluent BOD from the nth cell in a n cell series, mg/L
R	2.75	Final oxygen residual = 5-Initial oxygen in mg/L

Oxygen Required = 14.9 mg/L

Air Requirements

Flow	757	L/min
O_2 in Air	252	mg/L oxygen in Air
Efficiency	10%	
L air	0.0353	ft3
Air required	15.80	cfm

Key: BOD = biochemical oxygen demand
CESF = Chitosan Enhanced Sand Filtration
cfm = cubic feet per minute
EBCT = empty bed contact time
ft = feet
GAC = granular activated carbon
gal = gallon
gpm = gallons per minute
lb = pound
mg/L = mmiligram per liter

4.1 Potential Solids Removal Requirements

TSS Concentration	mg/L	2500.00	Estimated value for construction water
TSS Specific Gravity	S.G.	2.65	Assumed value for quartz
Iron Concentration	mg/L	30.00	Approximate average value from monitoring wells sampled.
Iron (III) Hydroxide Concentration	mg/L	57.32	Calculated value from reaction
Iron (III) Hydroxide Specific Gravity	S.G.	4.25	
Total Solids	mg/L	2589.97	
Total Solids Specific Gravity	S.G.	2.65	
Total Solids + Factor	mg/L	3107.97	Assume 20% safety factor for non-iron precipitated solids
Average Flow Rate	gpm	38.6	Assuming 5 million gallon (MG) total over 90 days construction period (worst case)
	liter/min	146	
Solids Removal (as 100% dry solids)	**mg/min**	**453845**	
	lb/day	**1440**	
	tons/day	**0.72**	

Solids Removal (as settled sludge)

Assumed Solids Concentration	%	20%	
Specific Gravity	S.G.	1.14	Calculated
Density	**lb/gal**	9.53	
	lb/cu.yd.	1924	
Mass Rate	**lb/day**	7198	
	tons/day	3.6	
Volumetric Rate	**gal/day**	755	
	cu.yd/day	3.74	

Solids Removal (as dewatered sludge)

Assumed Solids Concentration	%	50%	
Specific Gravity	S.G.	1.45	Calculated
Density	**lb/gal**	12.11	
	lb/cu.yd.	2446	
Mass Rate	**lb/day**	1511	
	tons/day	0.8	
Volumetric Rate	**gal/day**	125	
	cu.yd/day	0.62	

HS-250-AC

ORGANOCLAY/GRANULATED ACTIVATED CARBON

HYDROSIL INTERNATIONAL LTD.

APPLICATIONS
Groundwater
Industrial Water Reuse
Surface Water
Landfills
Emergency Spills

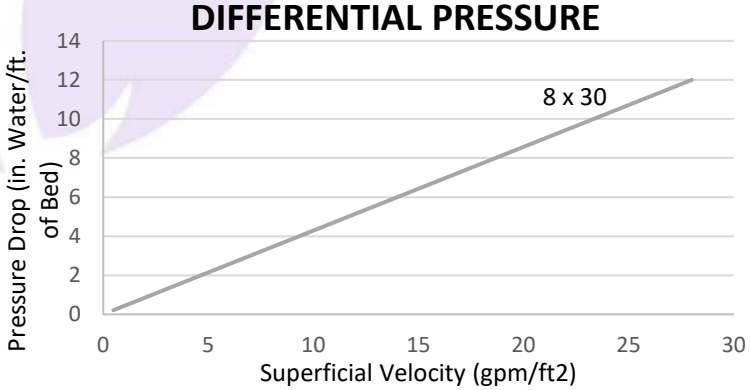
Hydrosil's HS-250-AC is a robust 50/50 blend by volume of pure organoclay, HS-200, and 8 x 30 mesh HS-AC. The HS-AC is high quality coconut shell carbon with extraordinary surface area, fine pore structure, high density, and superior hardness. The HS-200 offers high adsorption for select pollutants found groundwater from oil and gas industry and chemical industry.

By blending the two products Hydrosil introduces the HS-250-AC. The HS-250-AC is the most effective at removing oil, heavy metals, and large and small hydrocarbons from contaminated liquid.

TYPICAL PHYSICAL PROPERTIES

Apparent Density, lb./ft^3	44-45
Standard Mesh Size	8 x 30
Hardness, Min.	95
Iodine Number, Min.	1100

DIFFERENTIAL PRESSURE





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HS-MT

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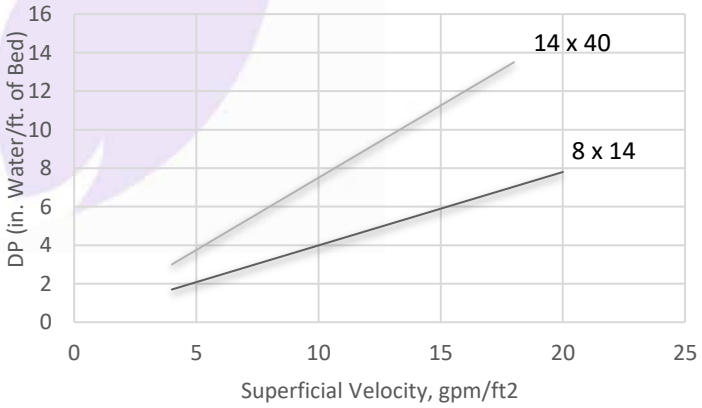
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APPENDIX F

WETLAND AND BUFFER MITIGATION PLAN

FINAL WETLAND AND BUFFER MITIGATION PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

WSP PROJECT PS21204410

Prepared for:

SKAGIT COUNTY PUBLIC WORKS

Mount Vernon, Washington

MARCH 22, 2024

FINAL WETLAND AND BUFFER MITIGATION PLAN

MARCH POINT (WHITMARSH) LANDFILL
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Prepared for:

Skagit County Public Works
Mount Vernon, Washington

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March 22, 2024

TABLE OF CONTENTS

1 Introduction....1
1.1 Project Description....1
1.2 Habitat Impacts and Restoration....2
2 Shoreline Restoration....4
3 Maintenance Requirements....5
3.1 Initial Five-Year Period....5
3.1.1 Watering....5
3.1.2 Mulching....6
3.1.3 Weeding....6
3.1.4 Tree Removal....6
3.1.5 Dead Shrubs....6
3.1.6 Debris Removal....7
3.1.7 Herbivory Control....7
3.2 Long-Term Maintenance....7
4 Monitoring Goals, Criteria, and Methods....8
4.1 Goals and Objectives....8
4.2 Success Criteria....8
4.3 Contingency Measures....8
4.4 Adaptive Management....9
4.5 Monitoring Methods....9
4.5.1 Riparian Shrub Survival and Riparian Herbaceous Plants and Marsh Vegetation Areal Coverage....9
4.5.2 Riparian Area Invasive Species Areal Coverage....9
4.5.3 Riparian Vegetation Herbivory Control....10
5 Reports....11
6 References....12

TABLES

Table 1 Maintenance and Monitoring Timing and Frequency
Table 2 Monitoring Methods, Criteria, and Contingency Measures

FIGURES

Figure 1 Vicinity Map
Figure 2 Estuarine and Palustrine Marsh Adjacent to March Point Landfill
Figure 3 Approximate Area of Estuarine and Palustrine Marsh to be Excavated
Figure 4 Riparian Shrub Habitat and New Intertidal Area
Figure 5 Plan View of Planting Area
Figure 6 Typical Section in Planting Area

APPENDICES

Appendix A Planting Plans and Specifications
Appendix B Skagit County Noxious Weed List

LIST OF ACRONYMS AND ABBREVIATIONS

Ecology	Washington State Department of Ecology
GCLL	geosynthetic clay laminated liner
HTL	high tide line
LFG	landfill gas
MLLW	mean lower low water
Site	March Point (Whitmarsh) landfill Site

1 INTRODUCTION

The former March Point (Whitmarsh) landfill (the Site) is one of the locations on Padilla Bay and the nearby Fidalgo Bay that was identified for remediation as part of the Puget Sound Initiative. The Site is located at 9663 South March Point Road in Anacortes, Washington (Figure 1), and is listed on the Washington State Department of Ecology (Ecology) Hazardous Sites List as Facility Site ID 2662. A remedial investigation/feasibility study (AMEC, 2017) was conducted, and a cleanup action plan (Ecology, 2020) was prepared for the selected alternative. Subsequently, Ecology and Skagit County signed a Consent Decree (No. 21-2 00194 29) for the cleanup of the landfill. WSP USA Environment and Infrastructure Inc. has prepared this wetland and buffer mitigation plan on behalf of Skagit County.

As part of the landfill remediation, approximately 0.39 acres of existing wetland habitat will be impacted by the construction. Ecology requested that a wetland and buffer mitigation plan be prepared that describes the habitats that will be impacted by the remedial activities, the habitats that will be restored/created to offset those impacts, and the maintenance and monitoring of the newly created habitat. This plan supersedes and replaces the maintenance plan that was included as Appendix A to the Cleanup Action Plan and that was an exhibit in the Consent Decree.

1.1 PROJECT DESCRIPTION

Several remedial alternatives were developed for the Site. The selected remedy was the installation of a geosynthetic clay laminated liner (GCLL) cap. The cleanup is comprised of the following:

- Demolition of the structures on Site.
- Installing stormwater control measures on and around the landfill.
- Moving approximately 62,000 cubic yards of solid waste (including concrete and anthropogenic debris on the shorelines) from the edges of the landfill inward, to allow construction of a permanent cap without expanding the footprint of the landfill. Approximately 2,600 of the 62,000 cubic yards of solid waste is below the high tide line (HTL[1]) at 10.27 feet mean lower low water (MLLW).
- Grading the waste to a mound per the Minimum Functional Standards in Washington Administrative Code 173-304 to promote stormwater runoff.
- Installing an approximately 3-foot-thick cap system, including an enhanced GCLL extending to the surrounding mudflats. The engineered cap will minimize infiltration of groundwater into the landfill and the GCLL will minimize discharge of groundwater from the landfill to surface waters.
- Treating wastewater generated during the construction work.
- Installing a landfill gas (LFG) collection system, which would passively vent LFG to the atmosphere.
- Providing groundwater collection/treatment as needed during construction to prevent off-site migration.
- Installation of a perimeter road for access to the wells and the LFG vent system.
- Installation of stub-outs for an irrigation system.
- Performing long-term monitoring of groundwater (quality and levels for hydraulic control purposes), leachate seepage, LFG, and the landfill closure facility.

[1] The HTL for the site was based on the highest predicted tide over a 10-year period. Under Section 404 of the Clean Water Act, the Corps regulates discharges of dredged and/or fill material at and waterward of the jurisdictional line, in tidal waters the jurisdictional line is high tide line (HTL). For determination of the HTL, the USACE lists several information sources used by the USACE, including but not limited to the annual highest predicted tides over a 10-year period into the future, and physical indicators observed at the site (USACE 2021).

- Institutional controls will be implemented when the cleanup action is complete, including deed restrictions and installation of a permanent chain link fence around the perimeter of the landfill to limit Site access.

The remediation is expected to significantly reduce or eliminate leachate seepage to the surface water, promote passive venting of LFG into the atmosphere, and limit sedimentation into the Padilla Bay Inner Lagoon from uncontrolled surface water drainage.

The work includes removal of existing concrete and anthropogenic debris from the shoreline and flattening the shoreline slope to 5H:1V (horizontal to vertical) or 4H:1V and constructing a multi-layer cap system. The upper 18 inches of the cap system will be of suitable soil to support growth of planted vegetative communities.

1.2 HABITAT IMPACTS AND RESTORATION

Portions of the shoreline along the Site consist partially of riprap, concrete, and anthropogenic debris. The shoreline is vegetated with invasive non-native plants, including Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*), and teasel (*Dipsacus fullonum),* with very little native vegetation. Native vegetation is generally restricted to patchy areas on the north, east, and south-southwest sides of the site. The native species observed include primarily red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), Douglas fir (*Pseudotsuga menziesii*), salmonberry (*Rubus spectabilis*), nettle (*Urtica dioica*), and sword fern (*Polystichum munitum*).

As part of the permitting for the implementation of the project, a critical areas assessment and wetland delineation was conducted (Hamer, 2021). The wetland delineation identified estuarine marsh along the north, east, and southeast edges of the Site (Figure 2). The estuarine marsh is dominated by herbaceous saltmarsh species such as saltmarsh bulrush (*Schoenoplectus maritimus*) and seaside arrowgrass (*Triglochin maritima*). In addition to the saltmarsh vegetated areas, there are large mudflat areas that contain no vegetation. On the southern edge of the landfill there is a small palustrine emergent marsh located in a swale between the site and South March Point Road (Figure 2). Vegetation within the palustrine emergent marsh is dominated by facultative and obligate species such as red alder (*A. rubra*), cattail (*Typha sp.*), and skunk cabbage (*Symplocarpus foetidus*).

Based on the extent of waste shown on the project drawings, a portion of the footprint of the landfill overlaps the footprint of both the estuarine and palustrine marshes and will be excavated as part of the construction. Although the exact extent of the landfill waste is not known, it is estimated that approximately 0.29 acre of estuarine marsh and 0.10 acre of palustrine emergent marsh will be excavated (Figure 3). The total affected area of the estuarine and palustrine emergent marsh is approximately 0.39 acres. The actual area of marsh that will be excavated is dependent on the extent of the landfill waste, which may vary from what is shown on the drawings. If the landfill waste does not extend as far into the marshes as currently estimated, then the affected area of existing marsh will be less than what is currently estimated.

Mitigation for the 0.39 acres impacted estuarine and palustrine emergent marsh will be accomplished through creation of approximately 1.15 acres of new intertidal habitat and establishment of 1.69 acres of riparian shrub habitat for a total of 2.84 acres (Figure 4). It is expected that restored intertidal habitat will recolonize with estuarine and palustrine vegetation naturally over time from native seed sources in the (bay/lagoon/adjacent marsh). Mitigation success is not dependent on the colonization of the intertidal area over the monitoring period.

Riparian plantings will be established from approximately the HTL (10.27 feet MLLW) to an elevation of approximately 17 feet MLLW (see Figure 5 and Figure 6). The vegetation that will be selected to be planted will include a variety of native shrubs and herbaceous plants; however, trees will not be planted to avoid the presence of root systems that could penetrate the cap system and possibly damage the GCLL. The decision to not plant trees was based on no trees being identified that would not potentially affect the integrity of GCLL. A temporary irrigation system will be installed to supplement rainfall. It is anticipated that supplemental watering will cease by Year 3 after the initial planting or sooner, if deemed appropriate. Approximately 1.69 acres of riparian shrub habitat will be created and/or restored upon completion of the project (Figure 5).

After regrading of the bank within the previous footprint of the landfill, the final surface of the regraded bank will be sand, which will be below the HTL. Approximately 1.15 acres of new intertidal habitat (below the HTL), that should be suitable for natural recruitment of marsh plants, will be created (Figure 4). Currently, the inner lagoon is a rich salt marsh that will serve as a seed source for the newly constructed intertidal area.

After the riparian buffer is planted, maintenance and monitoring will be conducted to ensure that the plants meet performance expectations. The planned maintenance and monitoring activities are described in Sections 3 and 4, respectively.

2 SHORELINE RESTORATION

As described above, riparian plantings will be established from approximately the HTL (10.27 feet MLLW) to an elevation of approximately 17 feet MLLW. The vegetation that will be selected to be planted will include a variety of native shrubs and herbaceous plants; however, trees will not be planted to avoid the presence of root systems that could penetrate the cap system and possibly damage the GCLL. A temporary irrigation system will be installed to supplement rainfall. The riparian plantings will be installed in the areas depicted in Figures 5 and 6. The detailed plans and specifications for the riparian plantings and irrigation system are provided in Appendix A. Included in Appendix A is the proposed plant schedule that shows the species that will be planted, the US Department of Agriculture Plant Wetland Indicator Status, the number of plants, and the plant spacing. The plant schedule also shows the species in the proposed herbaceous seed mix and the proposed seed mix for the upland portions of landfill. It is anticipated that the plantings will occur in the fall immediately following the landfill excavation and grading.

3 MAINTENANCE REQUIREMENTS

This section presents the maintenance requirements needed to ensure that the newly planted riparian vegetation on the Site becomes established. This wetland and buffer mitigation plan and its maintenance implementation is a key factor for establishment of the vegetation.

The initial five-year maintenance requirements have been developed to ensure that newly planted vegetation becomes established and is not out-competed by invasive species or destroyed by herbivores. The initial maintenance may include watering, mulching, weeding, and removal of trees, dead invasive shrubs, and anthropogenic debris. Dead native plants will be left on Site as a soil nutrient source and possible nesting and food source for animals.

The long-term maintenance section of this plan (Section 3.2) describes the maintenance activities that will be conducted after the initial five-year maintenance period and includes maintaining vegetation and other habitat attributes, control of invasive vegetation, and undertaking actions to address perturbations with a foreseeable probability of occurrence (e.g., rail accidents, illegal dumping, etc.), excluding force majeure events.

3.1 INITIAL FIVE-YEAR PERIOD

During the initial five-year period, Site inspections will be conducted periodically to assess whether:

- the plants are receiving sufficient water,
- the plants require additional mulching,
- the Site requires weeding,
- naturally recruited trees are colonizing the Site,
- the Site requires replanting,
- the Site requires anthropogenic debris removal, and
- herbivory is effectively controlled.

These are discussed below. The maintenance and monitoring timing and frequency is summarized in Table 1.

3.1.1 WATERING

A temporary irrigation system will be installed that can be used when rainfall is inadequate to sustain vegetation and "supplemental watering" is needed. Supplemental watering will likely be necessary for vegetation in the upland areas for a minimum of two years post-planting. Transplanted shrubs and herbaceous ground cover may require 1-inch or more of water each week during the summer months. Plants will be watered deeply, slowly, and thoroughly. Watering will be conducted to limit surface water runoff of irrigation water. Watering will occur early in the morning or evening/night to limit evaporation. The initial planting for the habitat project will occur after completion of the landfill cap in the fall. Plants will need to be watered following installation until rainfall amounts (1-inch weekly total) are sufficient to meet the requirements of the individual plants or until the plants enter dormancy. Once supplemental watering is started for the growing season, the watering system will need to be monitored to ensure it is operating correctly and effectively.

Plantings will be inspected weekly immediately after planting until they have entered dormancy or until rainfall amounts consistently reach 1-inch weekly total. The irrigation system may be controlled by moisture meters that are connected to the irrigation system. Moisture meters would allow the system to be operated based on the moisture of the soil rather than rainfall estimates. Alternatively, if soil moisture meters are not used, rainfall will be quantified by using a nearby meteorological observation station.

During the growing season (April through October) soil moisture monitoring using soil moisture meters or best professional judgment will be conducted to determine whether plants are receiving sufficient water and whether supplement watering is required each week. Supplemental watering will cease by Year 3 (or sooner, if deemed

appropriate), to assess and ensure conditions are suitable for plant survival without irrigation in the following years. See Appendix A for the design requirements for the irrigation system.

3.1.2 MULCHING

Mulching will occur during initial plant installation to help retain soil moisture by reducing evaporation and erosion, and to provide nutrients to the plants. A 3-inch-thick layer of mulch 18-inches in diameter will be applied around each plant. Supplemental mulching may occur during weeding activities, as necessary. The specifications for the much are provided in Appendix A. Mulch should be aged plant material comprising coarse-ground wood byproducts or chips ranging in size from 0.50 inch to 6 inches along the longest dimension. Mulch is typically obtained from mechanical grinding or shredding of harvested trees or portions of trees. Mulch may contain ground or shredded bark fines. Fines content of the mulch should not be greater than 20 percent.

The mulch may contain a mix of hardwood and softwood species such as hemlock and Douglas fir species. The mulch material should be free of weeds, weed seeds, deleterious materials, resins, tannins, and other materials that are detrimental to plant survival or vigor, or could lead to exceedances of hazardous substance cleanup levels at the Site. Mulch containing bark material or chips from cedar trees is unacceptable.

3.1.3 WEEDING

Weeding around upland riparian shrubs will be important to ensure establishment of the shrubs and prevent stress to the plants from competition for resources. The frequency will be determined using best professional judgment; however, weeding will be scheduled to occur as shown in Table 1. If deemed appropriate, the weeding schedule will be adjusted, or the frequency changed, to ensure that the growth or survival of the plantings are not affected by weeds.

A list of common weed species is provided in the Skagit County Noxious Weed List (Appendix B). If any of the Class "A" weeds or "Class B" and "Class C" weeds (see Appendix B) are found colonizing any portion of the site, they will be immediately controlled as required by law. If the invasive plant *Spartina* spp. (a Class "A" weed) is found colonizing any portion of the adjacent marsh, it will be controlled consistent with the Swinomish *Spartina* Control Program. If the invasive Scotch broom (*Cytisus scoparius*; Class "B" weed) or the Himalayan blackberry (*Rubus armeniacus*; Class "C" weed) is found colonizing any portion of the Site, they will be controlled.

A majority of the weeding will be performed using simple hand tools (e.g., rakes, hoes). Chemical treatment (herbicides) will be considered only if physical removal fails. Chemical treatments will only be applied after consultation and coordination with the appropriate local jurisdictions and Ecology.

3.1.4 TREE REMOVAL

Trees with deep root systems pose a potential threat to the integrity of the GCLL engineered cap and will not be planted or allowed to propagate. Research of potential tree options included shorter stature native trees that may have shallower root systems, but all species evaluated were determined to pose unacceptable risks to the cap. Additionally, large trees with shallow, but broad root systems (greater than 6 feet in diameter) also pose a threat to the engineered cap if they blow over. Volunteer tree species that recruit to the Site will be removed as needed to prevent establishment.

3.1.5 DEAD SHRUBS

Dead native plants will be left on Site as a potential soil nutrient source and possible nesting and food source for animals. Dead native plants will only be removed if the plants will potentially interfere with replanting if required. Replacement planting will be conducted and documented if shrub mortality of 30 percent or greater is observed during the first five years. If wide-scale replanting is proposed, species recommendations to maintain the desired diversity in the plant communities will be provided to the Potentially Liable Parties and Ecology. Replanting, if required, will be conducted in consultation with Ecology.

Any dead invasive shrubs will be removed from the site to limit potential invasive seed sources.

3.1.6 DEBRIS REMOVAL

Anthropogenic material that potentially impairs habitat functions will be removed from the perimeter of the Site on an as-needed basis. Small material will be removed by hand when practical.

3.1.7 HERBIVORY CONTROL

In addition to monitoring of herbivory described in Section 4.5.3, during periodic Site inspections and routine maintenance, plants will be inspected to determine if herbivory is potentially affecting riparian shrub survival. If severe cropping of plants by herbivores is observed, herbivory control measures (e.g., tree tubes or fencing) will be considered for installation.

3.2 LONG-TERM MAINTENANCE

Long-term maintenance will be conducted after the initial five-year period to ensure that habitat functions of the project are maintained. This includes maintaining vegetation and other habitat attributes, control of invasive vegetation, control and removal of trees, and undertaking actions to address perturbations with a foreseeable probability of occurrence (e.g., rail accidents, illegal dumping, etc.), excluding force majeure events. These activities will be conducted on an as-needed basis by facility maintenance or landscaping crews. Facility maintenance or landscaping crews will be instructed in recognizing and dealing with invasive species. Surveys for invasive species should occur in the spring and in late summer. These surveys will be used as the basis for determining whether maintenance is required. Visual surveys and cleanup of anthropogenic debris should occur a minimum of once per year. Large woody debris that recruits to the Site should be evaluated for stability and scour potential. Unstable logs should be anchored (if needed) to prevent damage to marsh vegetation.

This wetland and buffer mitigation plan will not cover force majeure events. Force majeure in the context of this discussion includes all physical events (e.g., storm or seismic events) that exceed the design criteria for the project (which was developed using accepted professional engineering standards) or other natural events such as wildfires.

4 MONITORING GOALS, CRITERIA, AND METHODS

4.1 GOALS AND OBJECTIVES

The goal of the construction of the riparian shrub buffer and new intertidal habitat is to create self-sustaining habitats that will restore and enhance ecosystem processes that support the array of key species groups. The construction of the habitat component of the landfill cleanup is intended to provide appropriate habitat diversity and ecological niches necessary for foraging and refuge opportunities for fish, birds, and other wildlife. The riparian shrub buffer will provide allochthonous inputs to the marsh e.g., leaves, twigs, and terrestrial insects. It is anticipated that the shrub buffer will also provide habitat for other terrestrial organisms including birds and small mammals.

The construction of the new intertidal area will provide suitable habitat for marsh colonization. It is expected that restored intertidal habitat will recolonize with estuarine and palustrine vegetation naturally over time from native seed sources in the (bay, lagoon, and adjacent marsh). The goal of intertidal habitat creation is to provide critical habitat functions, such as feeding and refuge for juvenile anadromous salmonids and other species.

Monitoring will be conducted at Years 1, 3, and 5 post-planting. In addition, an as-built survey will be prepared that will document the plants that were installed and will serve also as a "Year 0" monitoring report. The timing of the monitoring events is shown in Table 1. Table 2 provides a summary of the monitoring methods, criteria, and contingency measures which area described below.

4.2 SUCCESS CRITERIA

These success criteria are chosen because these are standards that can be measured and for which there are contingency or adaptive management measures that can be applied during the monitoring period. The following success criteria will apply to the project at Year 5:

- Planted shrub survival will be ≥ 70 percent,
- There will be ≤ 20 percent bare ground,
- There will be ≤ 10 percent cover invasive species identified on the 2024 Skagit County Noxious Weed List (Appendix B), and
- Herbivory is effectively controlled (based on obvious plant mortality due to herbivory).

Although monitoring to assess the above will be conducted during Years 1 and 3, the success criteria will only apply at Year 5. The Years 1 and 3 monitoring will be used to determine if adaptive management or contingency measures may need to be applied to meet the success criteria at Year 5. Monitoring of potential recruitment of marsh plants to the newly constructed intertidal area will be conducted in Years 1, 3, and 5; however, no success criteria for marsh plant recruitment will apply.

The above success criteria can be assessed by monitoring riparian vegetation survival and cover, invasive species cover, and plant herbivory. If the success criteria are met prior to Year 5, then monitoring may be terminated in consultation with Ecology and other applicable permitting entities.

4.3 CONTINGENCY MEASURES

Contingency measures are activities designed to help meet success criteria, such as replacing (replanting) dead plants, adding soil amendments, installing supplemental irrigation, augmenting herbivore exclusion systems, etc. Prior to any contingency measure being implemented, an investigation as to why the criterion was not met will

be conducted. In the event that a success criterion is not met because of installation flaws or lack of routine maintenance, then contingency measures will be implemented. If the success criterion is not met because of design flaws, mortality due to herbivory, or routine maintenance is not sufficient, then an adaptive management approach will be used.

4.4 ADAPTIVE MANAGEMENT

Prior to any adaptive management measures being implemented, the cause for the failure to meet a success criterion will be investigated. Adaptive management measures could include, but are not limited to, changing plant species, changing plant densities, adding fertilizer, or installing herbivore exclusion systems (e.g., netting, cages, or tubes around plants).

4.5 MONITORING METHODS

4.5.1 RIPARIAN SHRUB SURVIVAL AND RIPARIAN HERBACEOUS PLANTS AND MARSH VEGETATION AREAL COVERAGE

4.5.1.1 Monitoring Methods

An "as-planted" survey will be conducted following initial planting to serve as baseline of various cover classes (e.g., herbaceous plants and shrubs) using established photo points (fixed locations from which a time-series of photographs will be collected). Transects will be established through the riparian zone and intertidal zone to determine percent survival of planted shrubs and areal coverage for riparian herbaceous and marsh plants. Survival of planted shrubs will be evaluated during these surveys by counting dead or missing plants.

Survey techniques may include line intercept and established photo points.

4.5.1.2 Contingency Measures

Excessive failure rates (30 percent loss annually) for riparian plant survival or > 20 percent bare ground may be addressed by secondary planting if appropriate, and if causal factors of failure can be determined and corrected. Evidence of plant failure will trigger consideration of contingency measures. Depending on the hypothesized reason for failure, responses could include additional planting, soil amendments, herbivore exclusions, and/or focused stewardship efforts. Assumptions about appropriate plant species and other design factors will be reexamined and the project goals readjusted, in consultation with Ecology and other applicable permitting entities, if new information suggests adjustment is appropriate.

There are no contingency measures for colonization of the newly constructed intertidal area.

4.5.2 RIPARIAN AREA INVASIVE SPECIES AREAL COVERAGE

4.5.2.1 Monitoring Methods

Several permanent statistically based transects will be established relative to the shoreline; the number of transects will be based on habitat area and shape to adequately define the entire project. The transects will encompass portions of the project area suitable for marsh and riparian vegetation establishment. Permanent sampling locations (quadrats along transects) will be established and marked for elevation. Species composition of marsh and riparian vegetation and the occurrence of an individual invasive species that exceeds 1 percent by area will be reported. Invasive species to be identified and potentially controlled as part of this monitoring are defined as those invasive species that are on the 2024 Skagit County Noxious Weed List (Appendix B).

4.5.2.2 Contingency Measures

Any occurrence of total non-native and invasive species exceeding 10 percent by vegetated area will be controlled primarily by physical means (pulling, mowing, burning). Physical removal will occur as soon as invasive plants are identified and definitely prior to seed set. *Spartina spp.* that is found to colonize any portion of the Site

(irrespective of the areal coverage) will be immediately controlled consistent with the Swinomish *Spartina* Control Program; chemical treatment (herbicides) will only be considered if physical removal fails.

4.5.3 RIPARIAN VEGETATION HERBIVORY CONTROL

4.5.3.1 Monitoring Methods

Periodic, and initially frequent, visual inspections to determine if planted shrubs are affected by herbivory will be conducted.

4.5.3.2 Contingency Measures

Herbivory of riparian shrubs by nutria (*Myocastor coypus*) has occurred during fall and winter at another restoration site in Puget Sound. Although it is not known if nutria are present in the vicinity of the landfill, if any herbivory can be attributed to nutria, tree tubes and/or wire enclosures may be installed around the affected plants. If herbivory control devices are installed, they will be inspected periodically to ensure they are providing proper protection to the plants. If installed herbivory control devices are damaged, they will be repaired as soon as practicable.

Raccoons (*Procyon lotor*), beavers (*Castor canadensis*), and rabbits (unknown species) have been problematic at other Puget Sound restoration sites. It is unknown if these species occur at the Site; however, herbivory control for these species is similar to that of nutria (i.e., fenced enclosures) although fencing can be less effective in reducing herbivory by raccoons (they climb fences). Since the project is not installing marsh plants, it is not expected that Canada geese (*Branta canadensis*) will be a significant source of herbivory especially to the riparian shrubs. However, if Canada geese are present, they could graze the herbaceous plants that will be seeded at the Site but are unlikely to significantly affect herbaceous plant survival and coverage.

5 REPORTS

After completion of the construction of the restoration project, a restoration as-built report will be submitted that documents the acreages of the habitats that were created, number and species of shrubs that were planted, and as-built planting drawings. The planting as-built report may be included as part of the as-built report that will be submitted for the overall cleanup. The as-built report will provide the information detailed in Ecology's guidance for as-built reports.

An ecologist will prepare a draft and final monitoring report for submittal to Ecology after each monitoring event as described in Section 3.0. The following will be included in each report:

- Data tables with results from the monitoring event,
- Detailed species lists of plants and animals observed during the survey,
- Date of survey,
- Weather and tides during survey,
- A narrative description of any proposed contingency measures and reasoning,
- A narrative description of methods and contingency measures taken,
- Identification of planted and naturally recruited trees and shrubs,
- Any evidence of events such as large storms, dumping, or camping that may have affected the mitigation area,
- Interpretation of results,
- Map of photo points,
- Color photos, and
- A description of maintenance activities that were conducted.

Ecology may request that additional information be provided in the report, if needed to evaluate mitigation project conditions. The draft report will be submitted within 60 days of completion of the yearly monitoring event and will provide the information that is detailed in Ecology's guidance for monitoring reports. The final report will address Ecology's comments on the draft report and will be submitted within 30 days of comment receipt.

6 REFERENCES

AMEC Environment & Infrastructure, Inc. (AMEC). 2017. Final Remedial Investigation/Feasibility Study Report, March Point (Whitmarsh) Landfill, Skagit County, Washington. February.

Hamer Environmental, LP (Hamer). 2021. City of Anacortes, Critical Areas Assessment Report, Wetland Delineation and Marine OHWM, Whitmarsh Landfill Anacortes, WA. Prepared for Wood PLC.

US Army Corps of Engineers (USACE). 2021. Email from D. Douglas, Project Manager USACE to T. Price Wood PLC. Emailed June 16, 2021.

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TABLES

Table 1. Maintenance and Monitoring Timing and Frequency
March Point (Whitmarsh) Landfill
Skagit County, Washington

Activity	Years After Construction					
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Periodic Site Inspections	- Weekly until weekly rainfall 1-inch or plant dormancy	- Biweekly during growing season (Apr-Oct) - Monthly Nov-Mar	- Biweekly during growing season (Apr-Oct) - Monthly Nov-Mar	- Biweekly during growing season (Apr-Oct) - Monthly Nov-Mar	- Biweekly during growing season (Apr-Oct) - Monthly Nov-Mar	- Biweekly during growing season (Apr-Oct) - Monthly Nov-Mar
Maintenance/ Weeding	NC	- 2 times during spring - 1 time late summer - Additional times if needed	- 2 times during spring - 1 time late summer - Additional times if needed	- 2 times during spring - 1 time late summer - Additional times if needed	- 2 times during spring - 1 time late summer - Additional times if needed	- 2 times during spring - 1 time late summer - Additional times if needed
Riparian and Marsh Vegetation Areal Coverage (Section 4.5.1)	NC	- During peak of growing season (May-June)	NC	- During peak of growing season (May-June)	NC	- During peak of growing season (May-June)
Riparian Area Invasive Species Areal Coverage (Section 4.5.2)	NC	- During peak of growing season (May-June)	NC	- During peak of growing season (May-June)	NC	- During peak of growing season (May-June)
Riparian Vegetation Herbivory Control (Section 4.5.3)	- Weekly (Oct-Dec)	- During peak of growing season (May-June) - Late fall/early winter	- During peak of growing season (May-June) - Late fall/early winter	- During peak of growing season (May-June) - Late fall/early winter	- During peak of growing season (May-June) - Late fall/early winter NC	- During peak of growing season (May-June) - Late fall/early winter

Note:
NC = Not Conducted

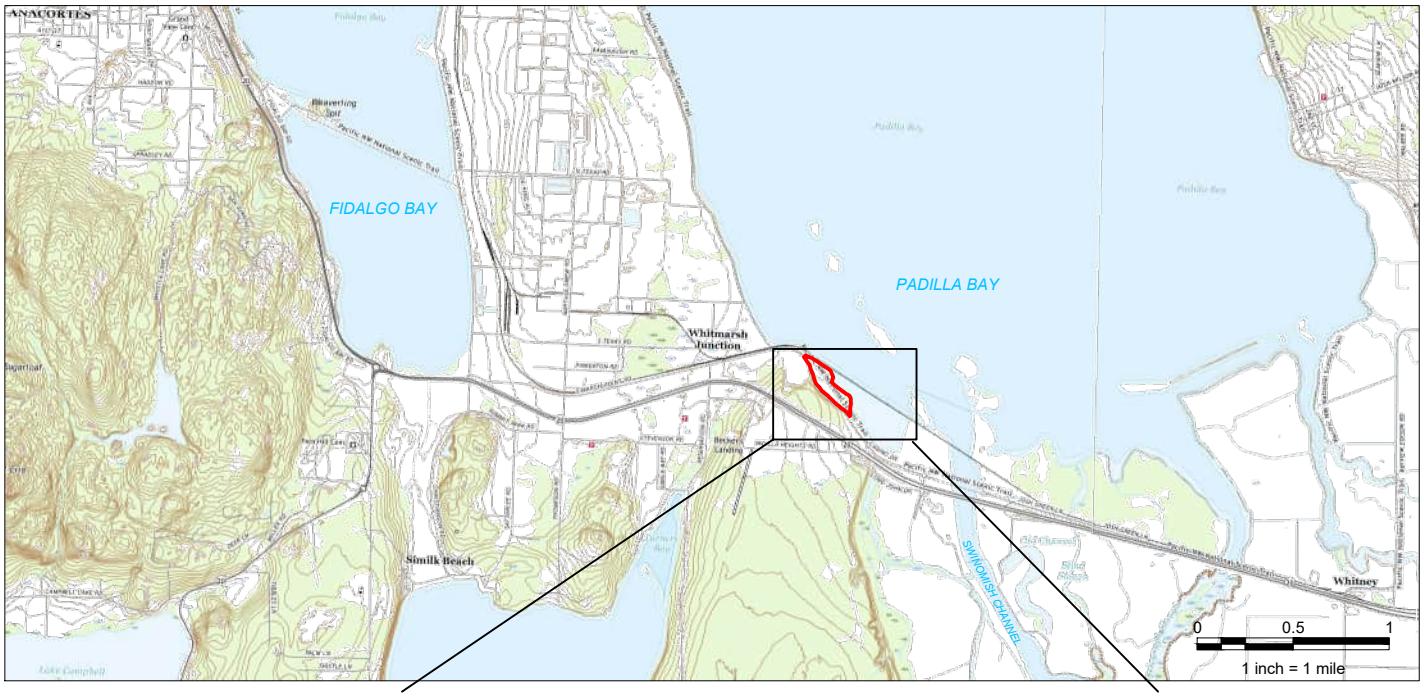
Table 2. Monitoring Methods, Criteria, and Contingency Measures
March Point (Whitmarsh) Landfill
Skagit County, Washington

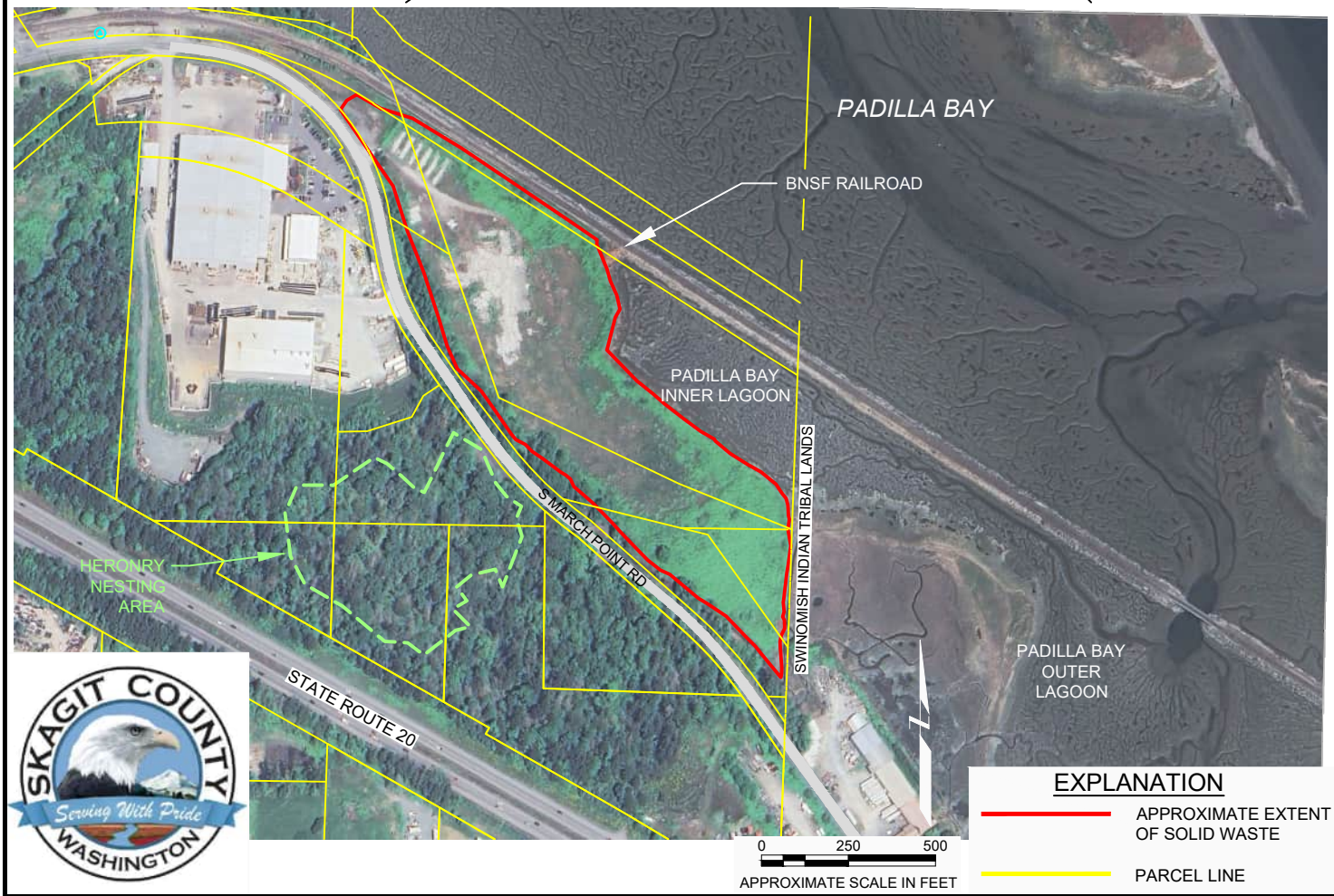
	Riparian Shrub Survival and Riparian Herbaceous Plants and Marsh Vegetation Areal Coverage [1]	Riparian Area Invasive Species Areal Coverage [2]	Riparian Vegetation Herbivory Control [3]
Description:	Percent survival of riparian shrubs should be ≥70%. Riparian herbaceous plant cover should be stable or increasing over time with percent bare ground ≤20%. These criteria apply only at Year 5.	The project should not contain more than 10% cover by area of invasive plant species identified on the 2024 Skagit County Noxious Weed List. This criterion applies only at Year 5.	Confirm herbivory does not affect plant survival.
Monitoring Tasks:	Conduct an as-built (Year 0) survey following initial plantings to serve as baseline of various cover classes using established photo points. The as-built survey will also be used to evaluate each planted shrub for survival and health/vigor. Permanent transects will be established within the planted riparian vegetation areas; the number of transects will be based on habitat area and shape to adequately define the entire project. The transects will encompass the planted portions of the project area. A general walking inspection of the full riparian vegetation area will be made to identify any specific areas of concern regarding vegetative health and any observations in changes (i.e., species composition and distribution) over time.	For riparian vegetation, permanent transects will be established relative to the shoreline and will encompass the planted portions of the project. The total number of transects will be based on habitat area and shape to adequately define the entire project. The transects will encompass the planted portions of the Site. Periodic general walking inspections of the entire project will be made to identify any specific areas of concern regarding noxious weed species and any observations in changes over time.	Riparian vegetation may need to be protected from herbivory if plant survival is significantly affected. Tree tubes or wire fencing may be installed and maintained if riparian plant survival is affected by herbivory. If herbivore exclusion devices are installed, periodic visual inspections will be made and if needed repairs made immediately. In addition, periodic general walking inspections of the entire project will be made to identify any specific areas of concern regarding herbivory. Riparian herbivory controls may be used until the plants have established.
Monitoring Methods:	Line intercept along permanent transects and established photo points will be used to record species composition and cover estimates. Permanent photo points will be established and photographs to adequately cover the Site will be collected each monitoring period. Photographs and inspections will be compared to previous monitoring events to determine change in and overall vegetative community health and survival.	Line intercept along permanent transects to record species composition and cover estimates of noxious weeds. Photographs and inspections will be compared to previous monitoring events to determine changes in noxious and invasive species presence, composition, and distribution.	Periodic visual inspections.

	Riparian Shrub Survival and Riparian Herbaceous Plants and Marsh Vegetation Areal Coverage [1]	Riparian Area Invasive Species Areal Coverage [2]	Riparian Vegetation Herbivory Control [3]
Schedule:	Years: 1, 3, and 5; see Table 1 for timing of monitoring.	Years: 1, 3, and 5; see Table 1 for timing of monitoring.	Years: 0, 1, 3, and 5; see Table 1 for timing and frequency of periodic Site inspections.
Contingency Measures:	Excessive failure rates (30% loss annually) for plant survival or >20% bare ground will be addressed by secondary planting if appropriate, and if causal factors of failure can be determined and corrected. Evidence of plant failure will trigger consideration of contingency measures. Depending on the hypothesized reason for failure, responses could include additional planting, soil amendments, herbivore exclusions, and/or focused stewardship efforts. Assumptions about appropriate plant species and other design factors will be reexamined and the project goals readjusted if new information suggests this path.	Any occurrence of total noxious species exceeding 10 percent coverage will be controlled primarily by physical means (pulling, mowing, burning). *Spartina* spp. that is found to colonize any portion of the Site (irrespective of the areal coverage) will be immediately controlled. Physical removal will occur as soon as invasive plants are identified and prior to seed set (see Table 1 for timing and frequency of maintenance/weeding). Chemical treatment (herbicides) will only be considered if physical removal fails.	Damage to herbivore exclusion devices if installed will be repaired as soon as practicable.

Notes:
[1] Section 4.5.1
[2] Section 4.5.2
[3] Section 4.5.3

FIGURES





EXPLANATION

- APPROXIMATE EXTENT OF SOLID WASTE
- PARCEL LINE

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Redmond, Washington 98052

PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
VICINITY MAP

DATE
NOVEMBER 2023

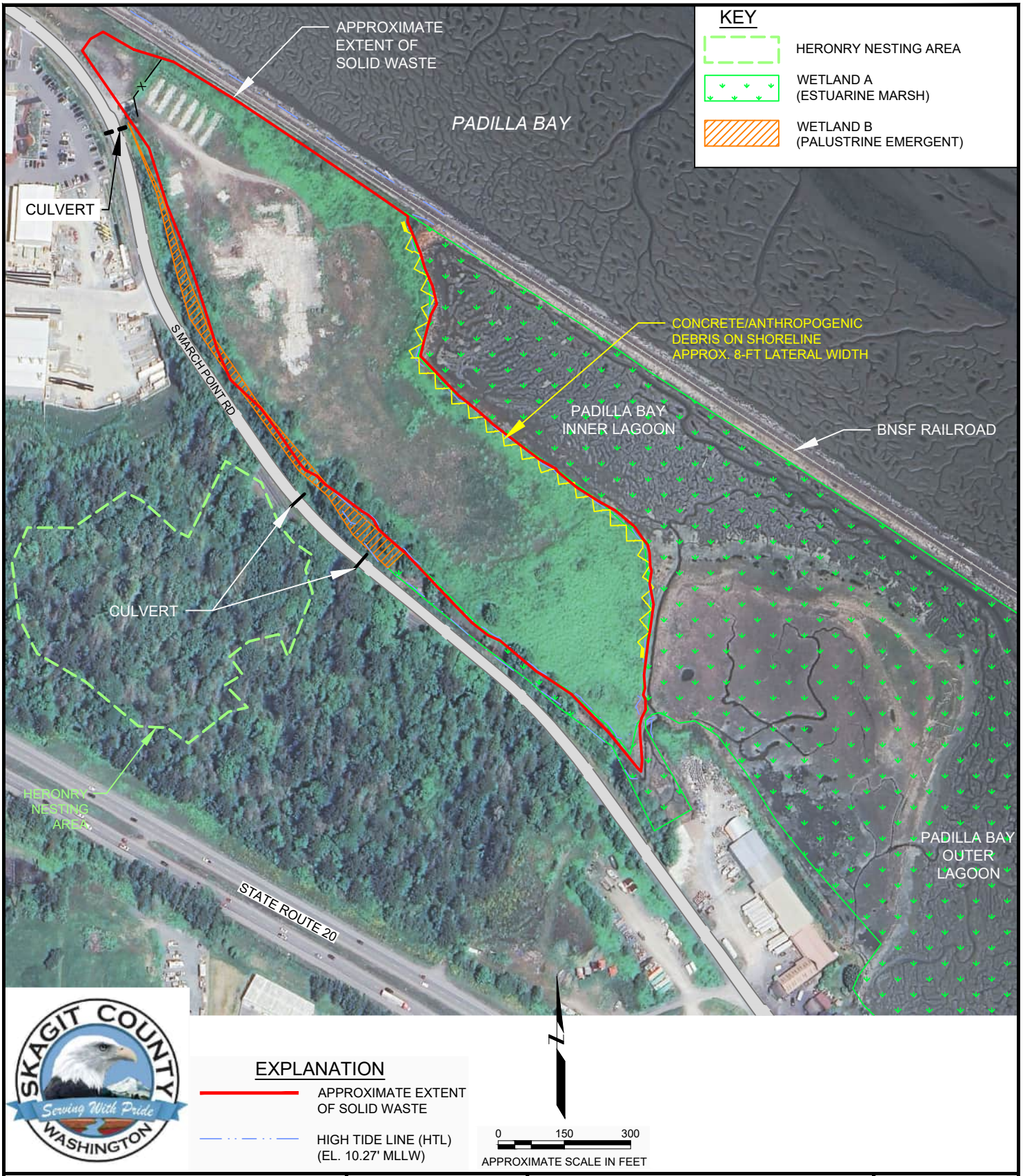
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
1

DRAWN BY: APS CHECKED BY: CW

C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\Whitmarsh-MarchPoint_Design-CoverSheet_100523.dwg - Figure 1 M&M (2) - Nov, 08, 2023 8:04am - USAS719374



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Redmond, Washington 98052

PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
ESTUARINE AND PALUSTRINE MARSH ADJACENT TO MARCH POINT LANDFILL

DATE
NOVEMBER 2023

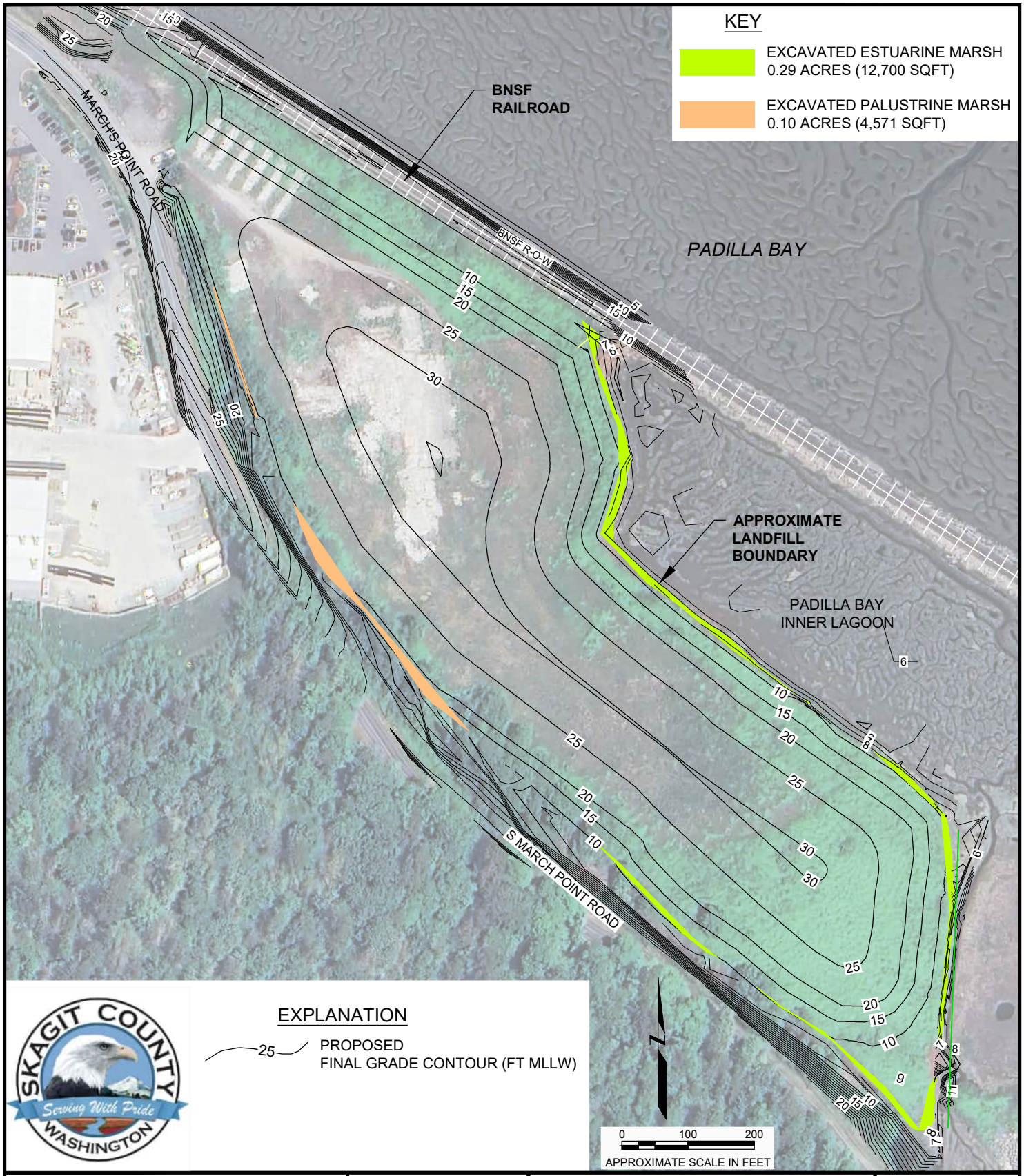
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
2

DRAWN BY: APS CHECKED BY: TLP

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Redmond, Washington 98052

PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
APPROXIMATE AREA OF ESTUARINE AND PALUSTRINE MARSH TO BE EXCAVATED

DATE
NOVEMBER 2023

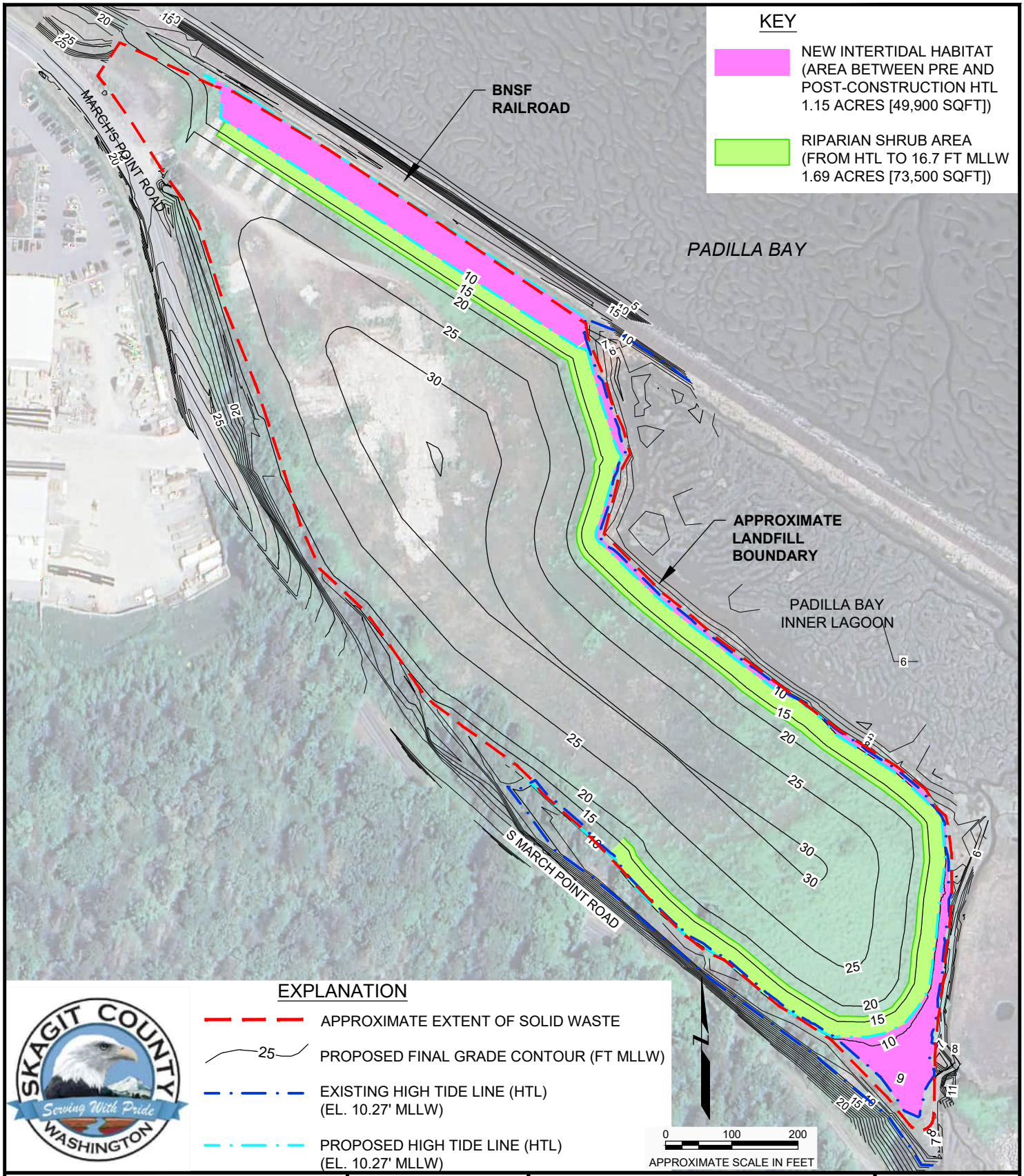
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
3

DRAWN BY: APS CHECKED BY: TLP

C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\Whitmarsh-MarchPoint_DesignDRAFT_110323-MLLW.dwg - Figure 3-M&M - Nov. 08, 2023 8:59am - USAS719374



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Redmond, Washington 98052

PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
RIPARIAN SHRUB HABITAT AND NEW INTERTIDAL AREA

DATE
FEBRUARY 2024

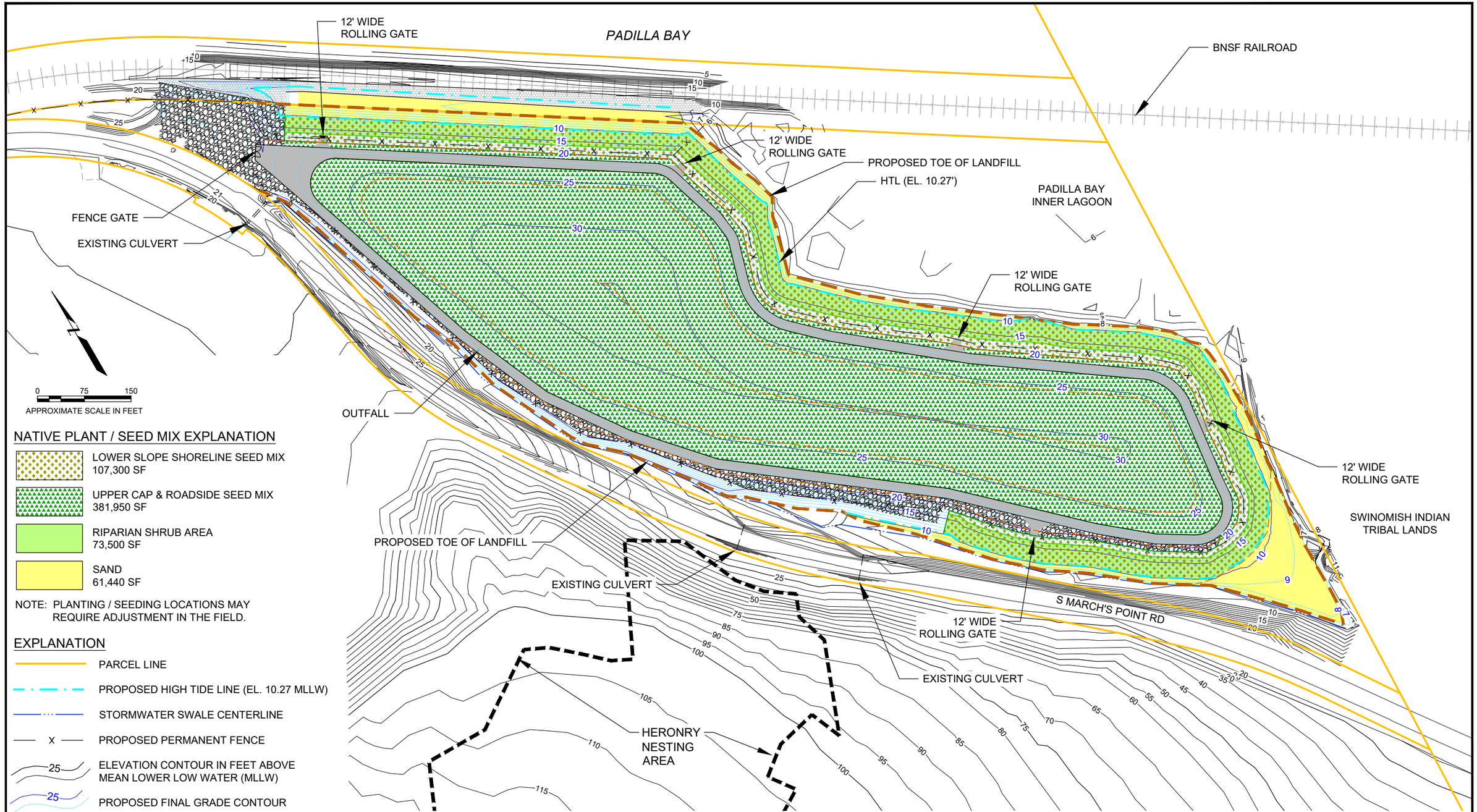
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
4

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NATIVE PLANT / SEED MIX EXPLANATION

- LOWER SLOPE SHORELINE SEED MIX
  107,300 SF
- UPPER CAP & ROADSIDE SEED MIX
  381,950 SF
- RIPARIAN SHRUB AREA
  73,500 SF
- SAND
  61,440 SF

NOTE: PLANTING / SEEDING LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27 MLLW)
- STORMWATER SWALE CENTERLINE
- PROPOSED PERMANENT FENCE
- ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RAILROAD BALLAST SURFACING AREA

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PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
PLAN VIEW OF PLANTING AREA

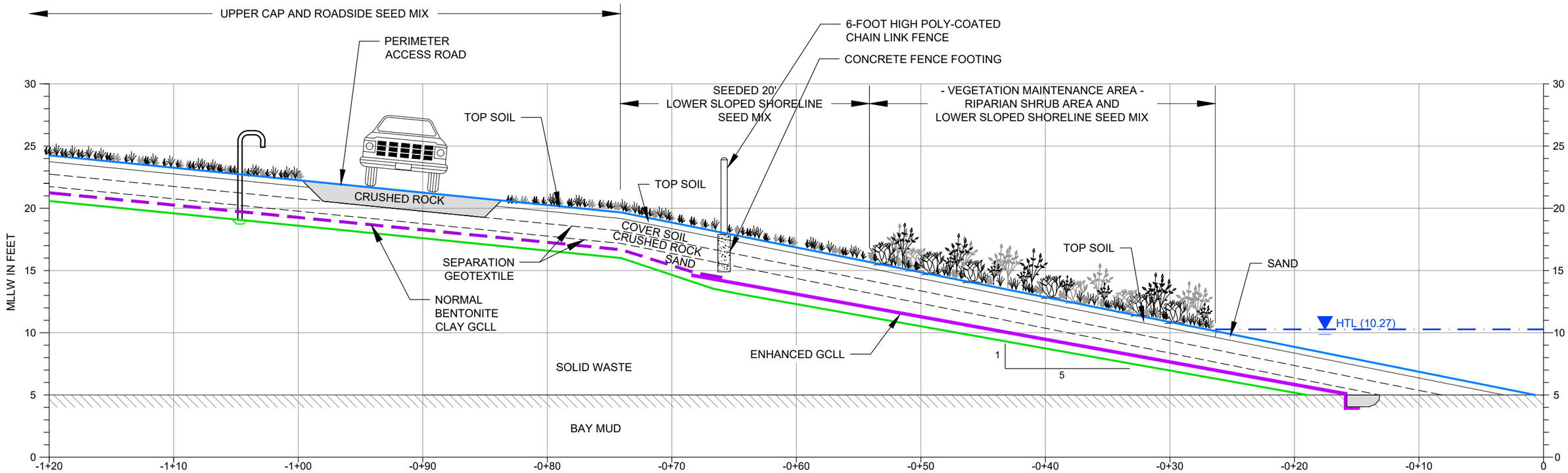
DATE
NOVEMBER 2023

SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
5

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1 DETAIL ALONG INNER LAGOON

0 4 8
APPROXIMATE SCALE IN FEET

DRAWN BY: APS CHECKED BY: CW

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PROJECT
WETLAND AND BUFFER MITIGATION PLAN
MARCH POINT (WHITMARSH) LANDFILL

TITLE
TYPICAL SECTION IN PLANTING AREA

DATE
NOVEMBER 2023

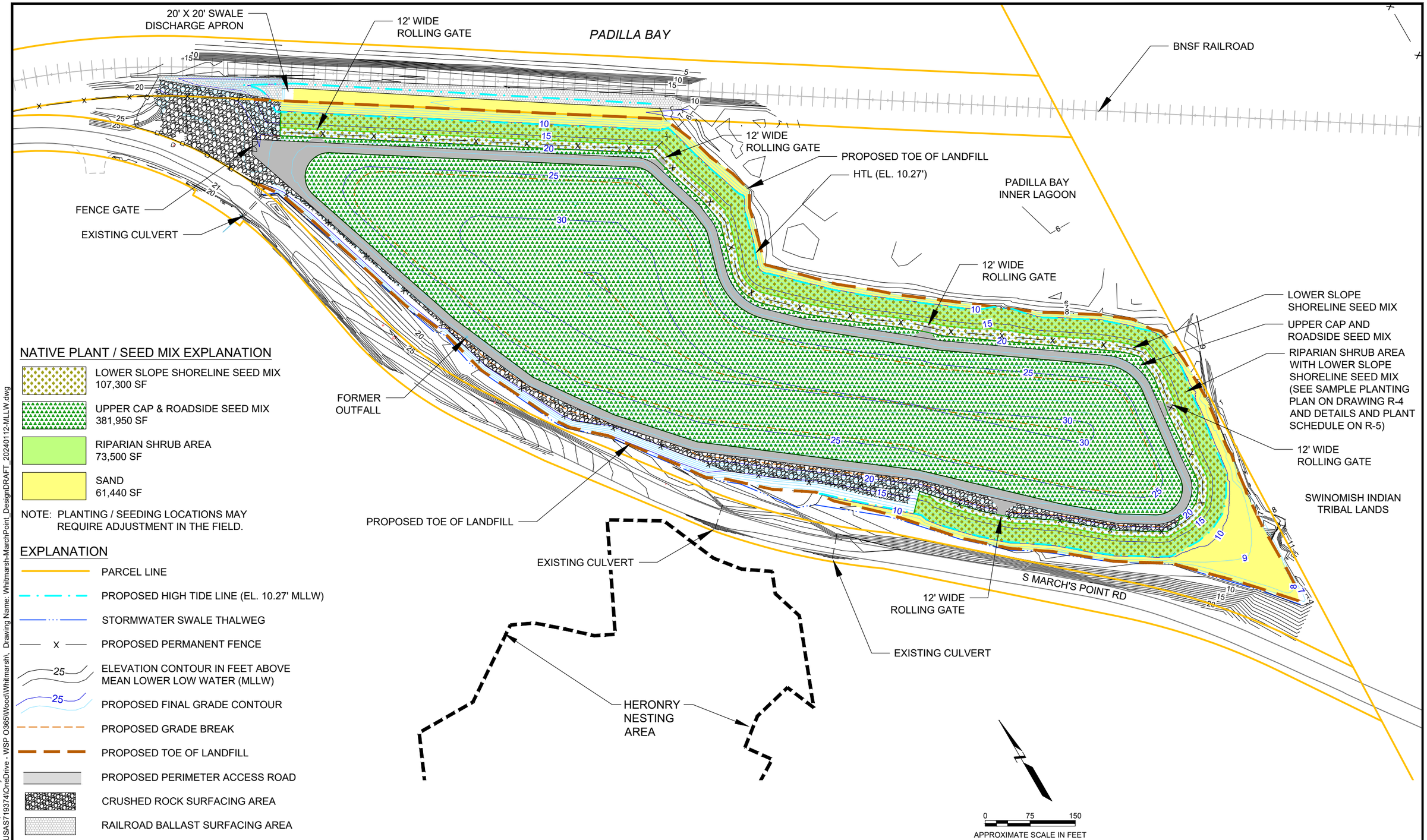
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
6

APPENDIX A

PLANTING PLANS AND SPECIFICATIONS



NATIVE PLANT / SEED MIX EXPLANATION

- LOWER SLOPE SHORELINE SEED MIX 107,300 SF
- UPPER CAP & ROADSIDE SEED MIX 381,950 SF
- RIPARIAN SHRUB AREA 73,500 SF
- SAND 61,440 SF

NOTE: PLANTING / SEEDING LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- PROPOSED PERMANENT FENCE
- ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RAILROAD BALLAST SURFACING AREA

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
1			

DRAWN AS
DESIGNED KT
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SITE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-1

Plot Date: 03/04/24 - 10:14am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

20' X 20' SWALE
DISCHARGE APRON

12' WIDE
ROLLING GATE

BNSF RAILROAD

12' WIDE
ROLLING GATE

PROPOSED TOE OF LANDFILL

HTL (EL. 10.27')

SWINOMISH INDIAN
TRIBAL LANDS

SEE SAMPLE PLANTING PLAN
SHOWN AT THIS AREA ON DRAWING R-4

PADILLA BAY
INNER LAGOON

12' WIDE
ROLLING GATE

LOWER SLOPE
SHORELINE SEED MIX

UPPER CAP AND
ROADSIDE SEED MIX

RIPARIAN SHRUB AREA
WITH LOWER SLOPE
SHORELINE SEED MIX
(SEE SAMPLE PLANTING
PLAN ON DRAWING R-4
AND DETAILS AND PLANT
SCHEDULE ON R-5)

0.3%
25%
10%
EL. 25.6-19.6
20%
6.5%
EL. 35.3-25.6
EL. 30-25.6
10
15
20
25
30

SEE DRAWING R-3

EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- PROPOSED PERMANENT FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TOE OF LANDFILL
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- SAND
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RAILROAD BALLAST SURFACING AREA

0 50 100
APPROXIMATE SCALE IN FEET

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

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REVIEWED KT

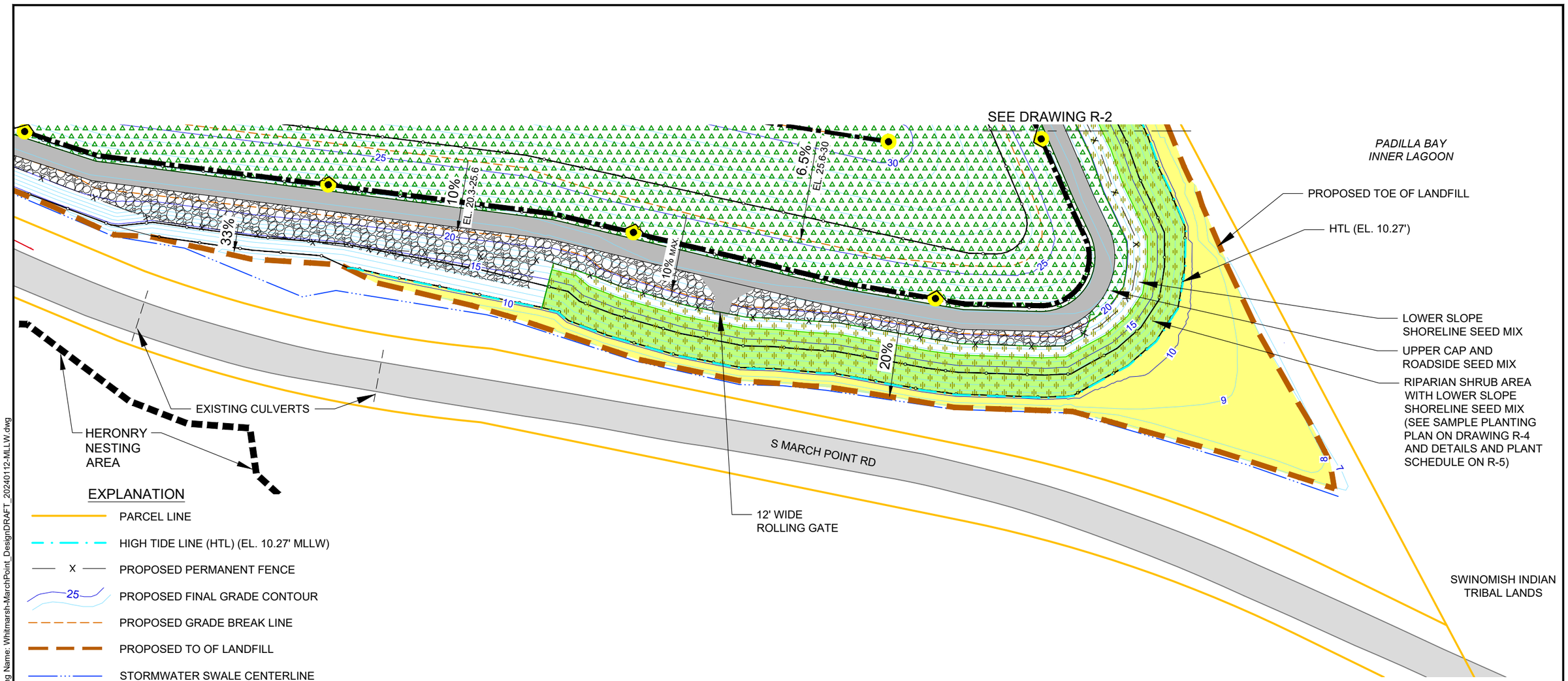
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PLANTING PLAN
ALONG PADILLA BAY INNER LAGOON

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING
R-2



EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- PROPOSED PERMANENT FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TO OF LANDFILL
- STORMWATER SWALE CENTERLINE
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- SAND
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA

0 40 80

APPROXIMATE SCALE IN FEET

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM:
WASP NAD83 NORTH USFT.
VERTICAL DATUM:
MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
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REVIEWED KT

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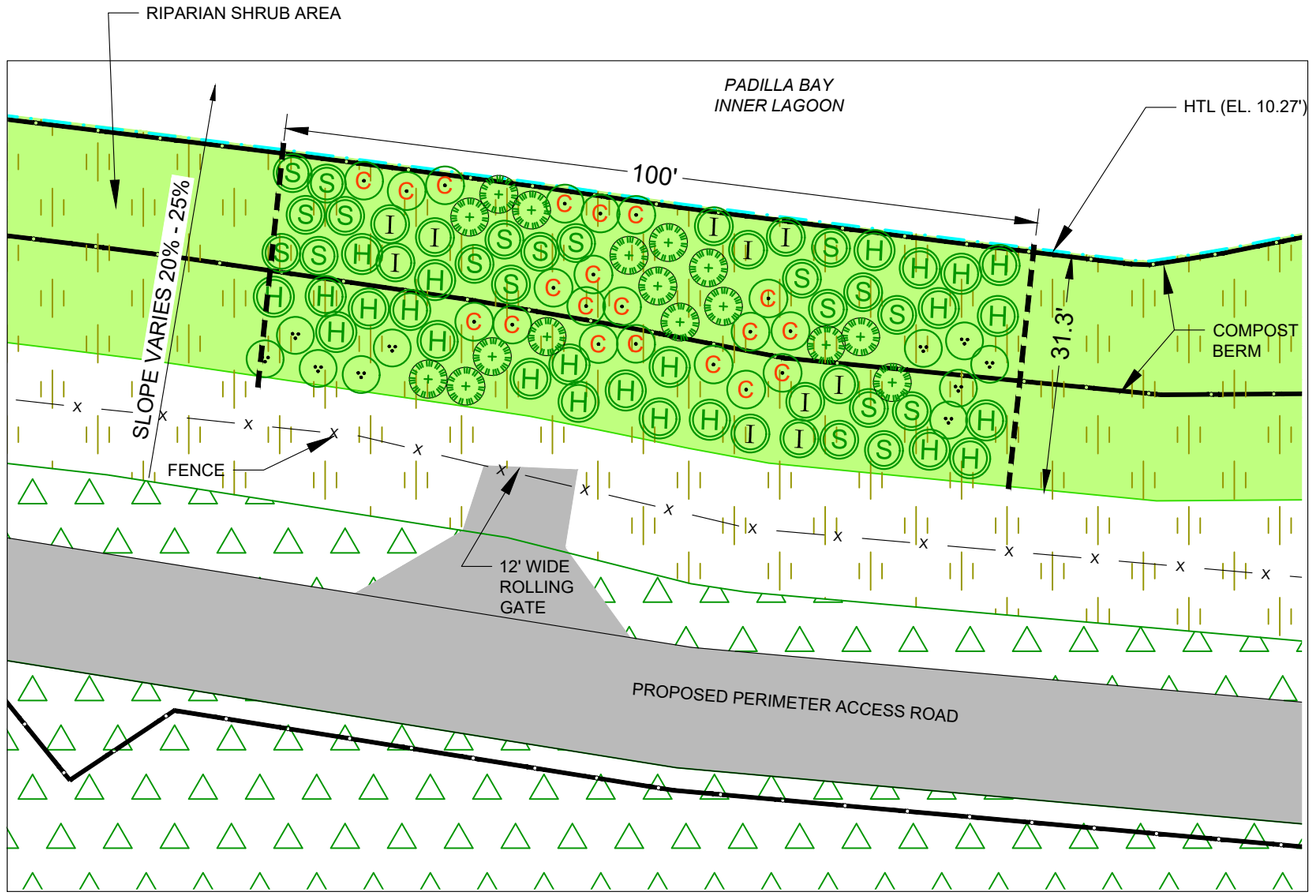
PLANTING PLAN ALONG SOUTHERN DITCH

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410

DRAWING
R-3

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg



1 SHORELINE RESTORATION - RIPARIAN SHRUB AREA

3,130 SF SAMPLE PLANTING PLAN (100' X 31.3')

RIPARIAN SHRUB AREA PLANT SYMBOL EXPLANATION

	SHRUBS	QUANTITIES
⊙	*AMELANCHIER ALNIFOLIA* SERVICEBERRY	*10*
⊕	*GAULTHERIA SHALLON* SALAL	*16*
I	*HOLODISCUS DISCOLOR* OCEANSPRAY	*10*
C	*RIBES SANGUINEUM* RED FLOWERING CURRANT	*20*
S	*SYMPHORICARPOS ALBUS* SNOWBERRY	*20*
H	*VACCINIUM OVATUM* EVERGREEN HUCKLEBERRY	*24*

100 TOTAL
(FOR 3,130 SF AREA)

SEED MIXES

LOWER SLOPE SHORELINE SEED MIX

UPPER CAP AND ROADSIDE SEED MIX

NOTES:
1. SEE DETAILS AND PLANT SCHEDULE ON DRAWING R-5 FOR SPECIES, SIZE AND SPACING INFORMATION.
2. PLANTING DENSITY AND LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

0 10 20
APPROXIMATE SCALE IN FEET

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

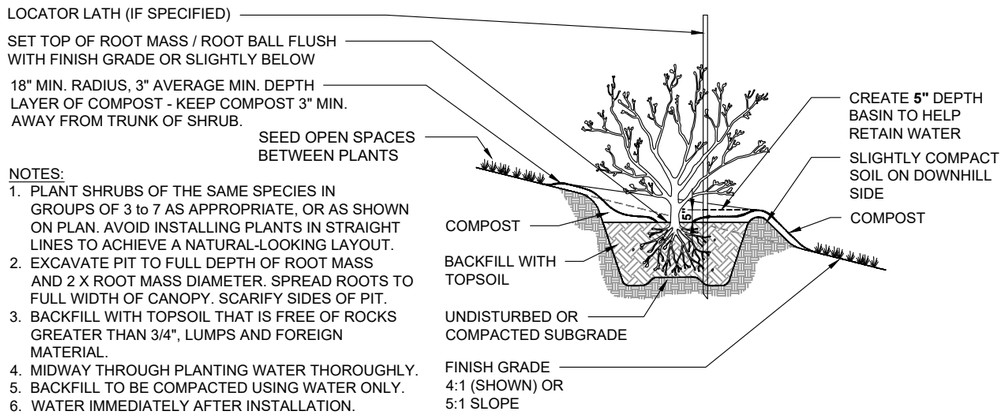
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SAMPLE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-4

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
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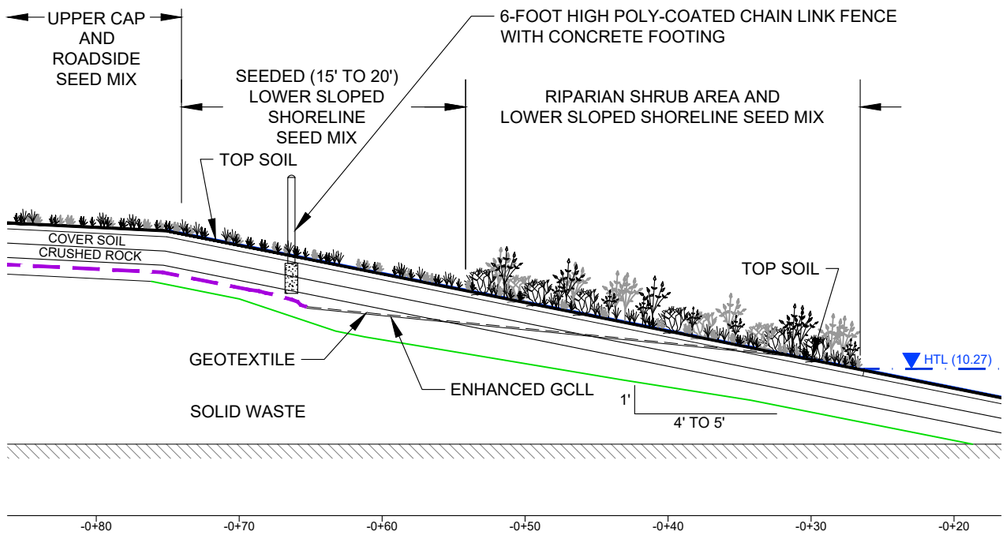


NOTES:

1. PLANT SHRUBS OF THE SAME SPECIES IN GROUPS OF 3 to 7 AS APPROPRIATE, OR AS SHOWN ON PLAN. AVOID INSTALLING PLANTS IN STRAIGHT LINES TO ACHIEVE A NATURAL-LOOKING LAYOUT.
2. EXCAVATE PIT TO FULL DEPTH OF ROOT MASS AND 2 X ROOT MASS DIAMETER. SPREAD ROOTS TO FULL WIDTH OF CANOPY. SCARIFY SIDES OF PIT.
3. BACKFILL WITH TOPSOIL THAT IS FREE OF ROCKS GREATER THAN 3/4", LUMPS AND FOREIGN MATERIAL.
4. MIDWAY THROUGH PLANTING WATER THOROUGHLY.
5. BACKFILL TO BE COMPACTED USING WATER ONLY.
6. WATER IMMEDIATELY AFTER INSTALLATION.

1 SHRUB PLANTING ON SLOPE

NOT TO SCALE



2 PLANTING DETAIL ALONG INNER LAGOON

NOT TO SCALE

NATIVE PLANT SCHEDULE

Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS	Spacing	Size	Condition	Planting Area
Shrubs - Lower Slope Shoreline			SF Area:	51,874	21,626	73,500				
			Acres	1.19	0.50	1.69				
Amelanchier alnifolia	Serviceberry		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry to Moist
Gaultheria shallon	Salal		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry - Upland
Holodiscus discolor	Oceanspray		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry - Upland
Ribes sanguineum	Red-flowering currant		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Moist to Wet
Symphoricarpos albus	Snowberry		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry to Moist
Vaccinium ovatum	Evergreen huckleberry		FACU	416	175	591	6 ft o.c	1 gal.	Container	Dry to Moist
Total			**Quan:**	**1,665**	**695**	**2360**				

Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS
Seed Mix - Lower Slope Shoreline (applied at 10 lbs. per acre)			SF Area:	78,520	28,780	107,300
		%	Acres	1.80	0.66	2.46
Agrostis stolonifera	Creeping bentgrass	15%	FAC	2.7	1.0	3.7
Aster subspicatus	Douglas aster	5%	NR	0.9	0.3	1.2
Atriplex patula	Saltweed	10%	FACW	1.8	0.7	2.5
Elymus mollis	Dunegrass	15%	NR	2.7	1.0	3.7
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.9	0.3	1.2
Grindelia integrifolia	Pacific gumweed	10%	FACW	1.8	0.7	2.5
Hordeum brachyantherum	Meadow barley	30%	FACW	5.4	2.0	7.4
Lathyrus japonicus	Beach pea	10%	FACU	1.8	0.7	2.5
Total		*100%*	**Pounds:**	**18.0**	**6.6**	**24.6**

Plant Name *Scientific*	Common		USDA Plant Wetland Status	AREA BETWEEN ROAD AND SLOPED PERIMETER	AREA WITHIN ROADWAY	TOTALS
Seed Mix - Upper Cap and Roadside (applied at 18 lbs. per acre)			SF Area:	15,192	366,758	381,950
		%	Acres	0.35	8.42	8.77
Deschampsia cespitosa	Tufted hairgrass	20%	FACW	1.3	30.3	31.6
Elymus glaucus	Blue wildrye	20%	FACU	1.3	30.3	31.6
Festuca rubra	Creeping red fescue	10%	FAC	0.6	15.2	15.8
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.3	7.6	7.9
Hordeum brachyantherum	Meadow barley	40%	FACW	2.5	60.6	63.1
Lupinus littoralis / rivulairs	Coastal lupine	5%	FAC	0.3	7.6	7.9
Total		*100%*	**Pounds:**	**6.3**	**151.6**	**157.8**

Notes:

1 - Scientific names and species identification taken from *Flora of the Pacific Northwest, 2nd Edition (Hitchcock and Cronquist, Ed. by Giblin, Ledger, Zika, and Olmstead, 2018).*

2 - Over-sized and/or container plants are suitable for replacement pending project engineer's or landscape architect's approval.

3 - Native plant species may be substituted or added with project engineer's or landscape architect's approval. Preference for substitutions is to select plant that shares the same USDA Plant Wetland Status Rating (see column 3 - USDA Plant Wetland Status).

4 - Planting density and locations may require adjustment in the field.

DEFINITION OF ACRONYMS:

USDA – United States Department of Agriculture

FACW (Facultative Wetland Plants)—Usually occur in wetlands, but may occur in non-wetlands.

FAC (Facultative Plants)—Occur in wetlands and non-wetlands.

FACU (Facultative Upland Plants)—Usually occur in non-wetlands, but may occur in wetlands.

2 NATIVE PLANT SCHEDULE

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

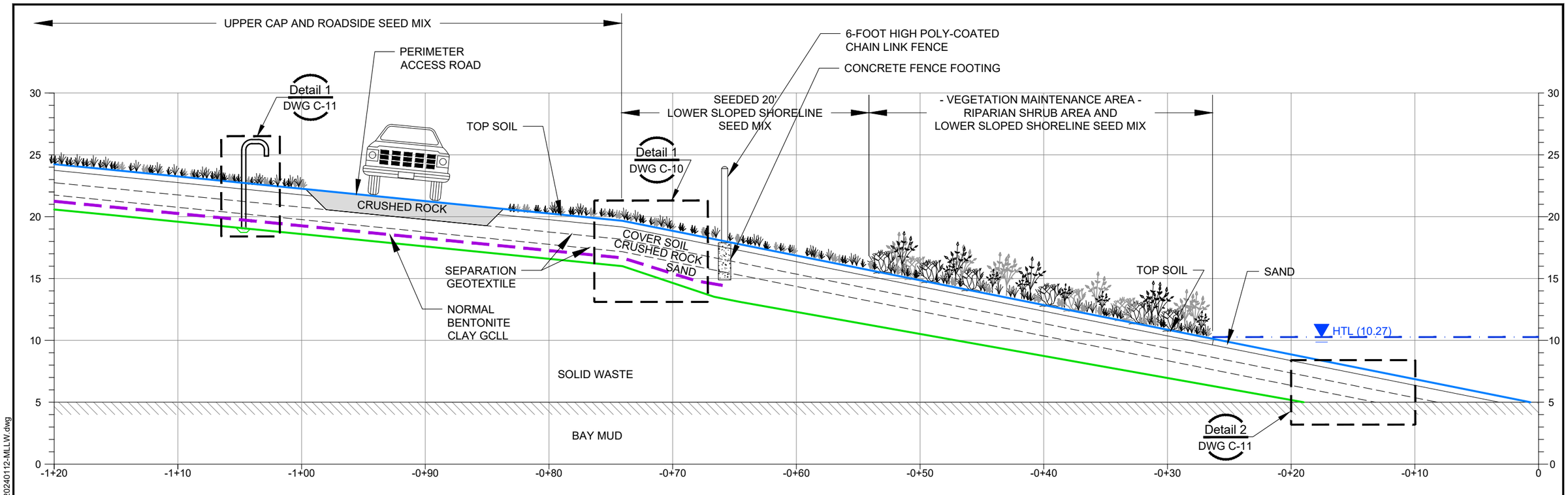
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18300 Redmond Way, Suite 200
Redmond, Washington 98052

PLANTING DETAILS AND NATIVE PLANT SCHEDULE

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-5

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg



1 DETAIL ALONG INNER LAGOON

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APPROXIMATE SCALE IN FEET

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
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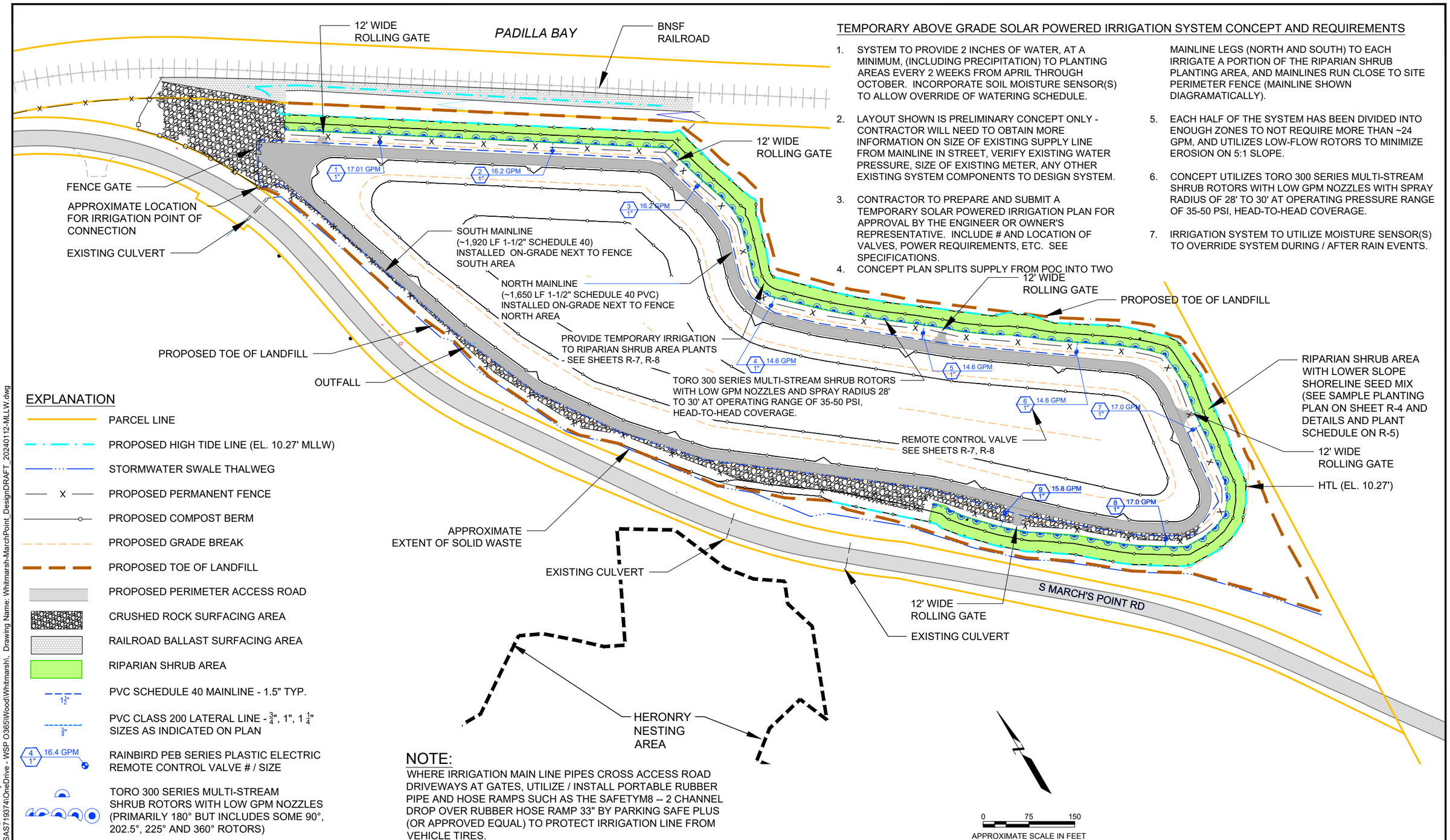
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SHORELINE RESTORATION DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-6



TEMPORARY ABOVE GRADE SOLAR POWERED IRRIGATION SYSTEM CONCEPT AND REQUIREMENTS

1. SYSTEM TO PROVIDE 2 INCHES OF WATER, AT A MINIMUM, (INCLUDING PRECIPITATION) TO PLANTING AREAS EVERY 2 WEEKS FROM APRIL THROUGH OCTOBER. INCORPORATE SOIL MOISTURE SENSOR(S) TO ALLOW OVERRIDE OF WATERING SCHEDULE.
2. LAYOUT SHOWN IS PRELIMINARY CONCEPT ONLY - CONTRACTOR WILL NEED TO OBTAIN MORE INFORMATION ON SIZE OF EXISTING SUPPLY LINE FROM MAINLINE IN STREET, VERIFY EXISTING WATER PRESSURE, SIZE OF EXISTING METER, ANY OTHER EXISTING SYSTEM COMPONENTS TO DESIGN SYSTEM.
3. CONTRACTOR TO PREPARE AND SUBMIT A TEMPORARY SOLAR POWERED IRRIGATION PLAN FOR APPROVAL BY THE ENGINEER OR OWNER'S REPRESENTATIVE. INCLUDE # AND LOCATION OF VALVES, POWER REQUIREMENTS, ETC. SEE SPECIFICATIONS.
4. CONCEPT PLAN SPLITS SUPPLY FROM POC INTO TWO MAINLINE LEGS (NORTH AND SOUTH) TO EACH IRRIGATE A PORTION OF THE RIPARIAN SHRUB PLANTING AREA, AND MAINLINES RUN CLOSE TO SITE PERIMETER FENCE (MAINLINE SHOWN DIAGRAMATICALLY).
5. EACH HALF OF THE SYSTEM HAS BEEN DIVIDED INTO ENOUGH ZONES TO NOT REQUIRE MORE THAN ~24 GPM, AND UTILIZES LOW-FLOW ROTORS TO MINIMIZE EROSION ON 5:1 SLOPE.
6. CONCEPT UTILIZES TORO 300 SERIES MULTI-STREAM SHRUB ROTORS WITH LOW GPM NOZZLES WITH SPRAY RADIUS OF 28' TO 30' AT OPERATING PRESSURE RANGE OF 35-50 PSI, HEAD-TO-HEAD COVERAGE.
7. IRRIGATION SYSTEM TO UTILIZE MOISTURE SENSOR(S) TO OVERRIDE SYSTEM DURING / AFTER RAIN EVENTS.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- PROPOSED PERMANENT FENCE
- PROPOSED COMPOST BERM
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RAILROAD BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- PVC CLASS 200 LATERAL LINE - $\frac{3}{4}$", 1", 1 $\frac{1}{4}$" SIZES AS INDICATED ON PLAN
- 4 1" 16.4 GPM — RAINBIRD PEB SERIES PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- TORO 300 SERIES MULTI-STREAM SHRUB ROTORS WITH LOW GPM NOZZLES (PRIMARILY 180° BUT INCLUDES SOME 90°, 202.5°, 225° AND 360° ROTORS)

NOTE:

WHERE IRRIGATION MAIN LINE PIPES CROSS ACCESS ROAD DRIVEWAYS AT GATES, UTILIZE / INSTALL PORTABLE RUBBER PIPE AND HOSE RAMPS SUCH AS THE SAFETYM8 -- 2 CHANNEL DROP OVER RUBBER HOSE RAMP 33" BY PARKING SAFE PLUS (OR APPROVED EQUAL) TO PROTECT IRRIGATION LINE FROM VEHICLE TIRES.

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
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TEMPORARY IRRIGATION CONCEPT PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-6

Plot Date: 03/04/24 - 10:15am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

20' X 20' SWALE
DISCHARGE APRON

BNSF RAILROAD

0.3%

12' WIDE
ROLLING GATE

PROPOSED TOE OF LANDFILL

HTL (EL. 10.27')

SWINOMISH INDIAN
TRIBAL LANDS

PADILLA BAY
INNER LAGOON

RIPARIAN SHRUB AREA
WITH LOWER SLOPE
SHORELINE SEED MIX
(SEE SAMPLE PLANTING
PLAN ON DRAWING R-4
AND DETAILS AND PLANT
SCHEDULE ON R-5)

1 1" 17.01 GPM

2 1" 16.2 GPM

3 1" 16.2 GPM

4 1" 14.6 GPM

5 1" 14.6 GPM

6 1" 14.6 GPM

7 1" 17.0 GPM

25%
EL. 25.6-19.6

10%
EL. 25.6-19.6

6.5%
EL. 35.3-25.6

6.5%
EL. 30-25.6

20%

20%

1.5" IRRIGATION MAINLINE
CONTINUES TO POINT OF CONNECTION

12' WIDE
ROLLING GATE

225° ROTOR

SEE DRAWING R-8

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- PROPOSED PERMANENT FENCE
- PROPOSED COMPOST BERM
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RAILROAD BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- PVC CLASS 200 LATERAL LINE - $\frac{3}{4}$", 1", 1 $\frac{1}{4}$" SIZES AS INDICATED ON PLAN
- 4 1" 16.4 GPM — RAINBIRD PEB SERIES PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- TORO 300 SERIES MULTI-STREAM SHRUB ROTORS WITH LOW GPM NOZZLES (PRIMARILY 180° BUT INCLUDES SOME 90°, 202.5°, 225° AND 360° ROTORS)

0 50 100
APPROXIMATE SCALE IN FEET

Plot Date: 03/04/24 - 10:18am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

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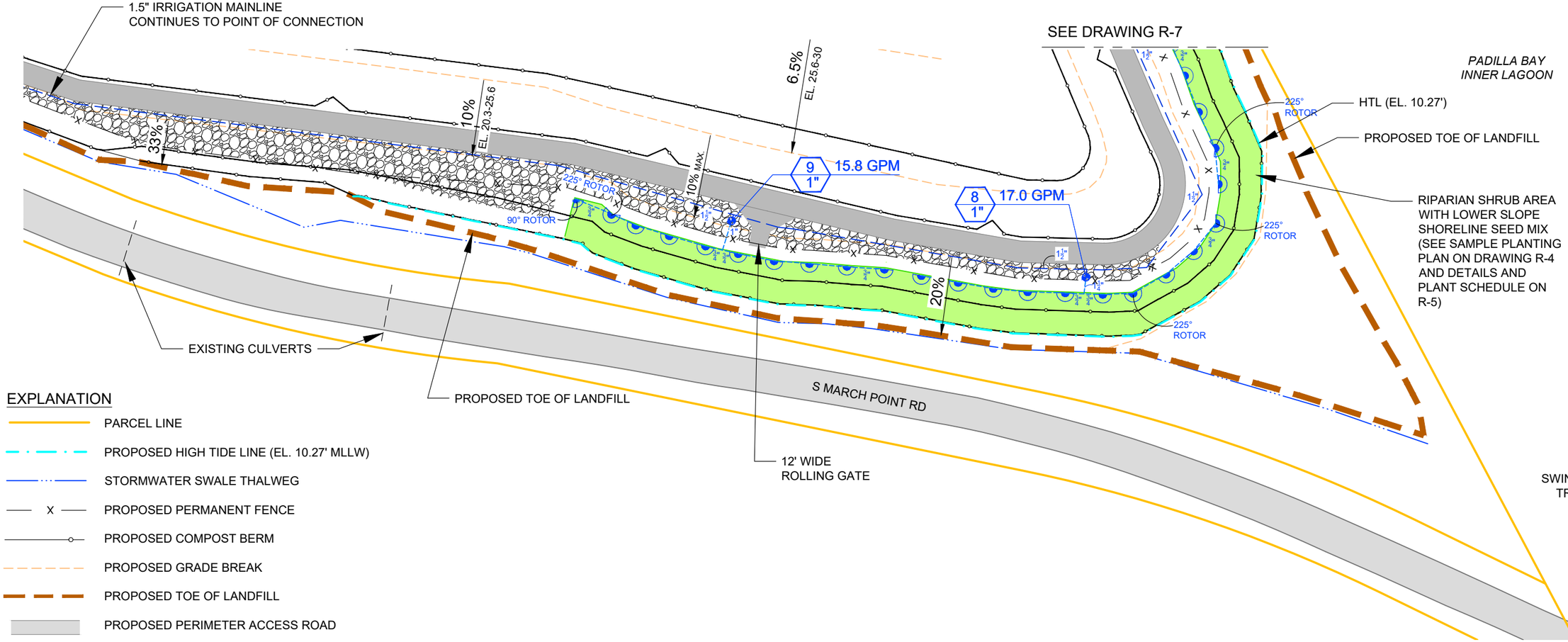
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Redmond, Washington 98052

TEMPORARY IRRIGATION CONCEPT ALONG PADILLA BAY INNER LAGOON

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410
DRAWING R-7



EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- PROPOSED PERMANENT FENCE
- PROPOSED COMPOST BERM
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED ROCK SURFACING AREA
- RIPARIAN SHRUB AREA
- PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- PVC CLASS 200 LATERAL LINE - $\frac{3}{4}$", 1", 1 $\frac{1}{4}$" SIZES AS INDICATED ON PLAN
- 4 / 1" 16.4 GPM — RAINBIRD PEB SERIES PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- TORO 300 SERIES MULTI-STREAM SHRUB ROTORS WITH LOW GPM NOZZLES (PRIMARILY 180° BUT INCLUDES SOME 90°, 202.5°, 225° AND 360° ROTORS)

0 40 80
APPROXIMATE SCALE IN FEET

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

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TEMPORARY IRRIGATION CONCEPT ALONG SOUTHERN DITCH

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 03/04/24
PROJECT NO.: PS21204410

DRAWING
R-8

Plot Date: 03/04/24 - 10:18am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_DesignDRAFT_20240112-MLLW.dwg

INTRODUCTION TO THE SPECIAL PROVISIONS

12/27/2023

Division 8

8.01 – Erosion Control and Water Pollution Control
8.02 – Roadside Restoration
8.03 – Irrigation Systems

The work on this project shall be accomplished in accordance with the *Standard Specifications for Road, Bridge and Municipal Construction*, 2024 edition, as issued by the Washington State Department of Transportation (WSDOT). The Standard Specifications, as modified or supplemented by the Amendments to the Standard Specifications and these Special Provisions, all of which are made a part of the Contract Documents, shall govern all of the Work.

These Special Provisions are made up of both General Special Provisions, which may have project-specific fill-ins; and project-specific Special Provisions. Each Provision either supplements, modifies, or replaces the comparable Standard Specification, or is a new Provision. The deletion, amendment, alteration, or addition to any subsection or portion of the Standard Specifications is meant to pertain only to that particular portion of the section, and in no way should it be interpreted that the balance of the section does not apply.

Also incorporated into the Contract Documents by reference are:

- *Manual on Uniform Traffic Control Devices for Streets and Highways*, currently adopted edition, with Washington State modifications, if any
- *Standard Plans for Road, Bridge and Municipal Construction*, WSDOT/APWA, current edition

Contractor shall obtain copies of these publications, at Contractor's own expense.

Division 8 Miscellaneous Construction

8-01 Erosion Control and Water Pollution Control

8-01.3(9)B Gravel Filter, Wood Chip, or Compost Berm
8-01.3(9)B is supplemented by the following:

Compost Berms shall be constructed in accordance with the detail in the Plans. Compost shall be Medium Compost. The Compost Berms shall be installed parallel to the final contours, as shown in the plans, using pneumatic equipment.

8-02 Roadside Restoration

8-02.3(1) Responsibility During Construction
8-02.3(1) is supplemented by the following:

The term 'Contractor' as used in this specification section shall refer to the contractor selected by owner. Contractor may elect to subcontract all or part of the landscape work described in this section.

Provide protection for all property, persons, work in progress, structures, existing landscape work to remain, utilities, walls, walks, paved surfaces, drainage materials, water-proofing and other membranes, and all survey markers and monuments from damages incurred arising from this contract. Contractor shall pay for any such damage at no additional cost to owner.

Verify locations of all underground utilities prior to commencement of work. Approximate locations of existing known utilities have been shown on architectural / engineering or survey drawings. Contractor shall be responsible for verifying locations of utilities and for the protection of said utilities. Promptly notify the owner's representative of any conflict between proposed work and obstructions.

General - Verify field conditions and that necessary preceding work has been completed and is satisfactory to receive work in this section. Commencement of work constitutes acceptance of conditions as satisfactory. Do not seed when the temperature is below 55 degrees f. Under no circumstances will seeding during freezing weather or in frozen ground be permitted. Remove all plant tags and flags prior to final inspection. Ensure that debris, such as plant containers left over from work, is removed from work areas. Containers and other construction debris shall be removed from the project site by the contractor and disposed of at an appropriate refuse center. Confine operations including material and equipment storage, to working areas allotted by owner for operations. The work site shall be progressively cleaned of debris and rubbish as work proceeds. Take necessary precautions to protect work in progress, property, persons, walks, curbs, pavement, fences, and buildings from any damage that might be incurred arising from this contract. Do not mix planting soil directly on paved surfaces. Damage incurred or arising from this contract shall be paid by the contractor.

Landscape Grading and Soil Preparation - Subgrade treatment and placement of topsoil work shall have been performed prior to beginning landscape work. Finish grading and finish elevation shall have been achieved prior to plant installation.

Permits, Codes and Ordinances - Obtain and pay for all necessary permits and fees required by

applicable codes and ordinances for this work that have not been procured by the owner. Comply with all applicable codes, regulations, and ordinances that pertain to this work. Consult with owner if there are questions regarding these requirements.

Clean all paved surfaces and planted areas of soil and debris on a daily basis. Clean all paved surfaces affected by landscape work prior to final acceptance.

8-02.3(2)C Plant Establishment Plan
8-02.3(2)C is supplemented by the following:

Submittals – Maintenance Schedule: Contractor shall submit to owner's representative a schedule of watering and maintenance activities to be performed by contractor during the construction of the contract, up to the point of final acceptance of planting and irrigation. The schedule shall delineate specific activities and their frequency during the period between time of initial planting and final acceptance and shall be submitted to the engineer prior to provisional acceptance.

8-02.3(3)B Roadside Seeding, Planting and Lawn Area Weed Control
Section 8-02.3(3)B is supplemented by the following:

Summary – Furnish all labor, materials, equipment, and related items necessary to complete the work shown on the drawings and or specifications for both the lagoon, ditch, and interior site areas. The items of work to be performed include but are not limited to: Treatment of finish grade; seeding and planting of specific plant materials; installation of plants, wood mulch, fertilizer, amendments; guarantee maintenance and protection; coordination with separate contractors; and all other related items required to complete the work in the best accepted trade practices.

Hand Clearing of Invasive Plants **that colonize the site post grading activities**, prior to plant installation - Confirm limits of non-native invasive plants per field verification with engineer before proceeding with clearing in these areas. Notify engineer one week prior to removal date. Remove the following non-native invasive plants manually using hand tools and by hand pulling: Himalayan blackberry (rubus armeniacus), Japanese knotweed (polygonum cuspidatum), reed canary grass (phalaris arundinacea), English ivy (hedera helix), black locust (robinia pseudoacacia), and all other invasive species that have not been specifically listed. Remove all above ground plant material and remove below ground rhizomes and roots. Transport plant, root, and rhizome materials carefully to avoid contamination of adjacent areas and travel corridors. Remove and dispose of all invasive plant debris at an approved composting facility.

Pesticides and herbicides shall not be used without written authorization from engineer. At a minimum contractor shall notify engineer for approval 30 workdays prior to use. Approval by local and federal agencies may also be required prior to use. Spraying shall be conducted only by those with a Washington State applicator's license with an "aquatics" endorsement and an aquatics pest management permit from the Washington State Department of Ecology.

8-02.3(4)A Topsoil Type A
8-02.3(4)A is supplemented by the following:

Topsoil Type A – The Contractor shall submit a certification by the supplier that the contents of

the Topsoil meet the requirements in these Special Provisions. Submit a one-half-cubic-foot sample of material and test results for topsoil proposed for the project. The contractor shall submit and pay for all material testing.

The Contractor will submit results of chemical analysis for analytes shown in Table 1 (below) for topsoil that is proposed for use at the site. The results must be submitted to the owner for approval at least three weeks prior to the purchase of the material.

These topsoil special provisions apply only to topsoil and amendments, and do not apply to the landfill cap layer of cover soil.

8-02.3(5)A Seeding Area Preparation
8-02.3(5)A is supplemented by the following:

Hydroseeding - Hydroseed areas as shown on the drawings. Contractor shall give the engineer notice of seeding operation 48 hours prior to seeding. Apply fertilizer, seed, and mulch in one operation using approved hydraulic equipment at the following rates: recycled paper/wood fiber mulch combination: 50 pounds per 1,000 square feet. Seed: use rates provided for seed mixes in native plant schedule. Fertilizer: 10 pounds per 1,000 square feet or as recommended by supplier. Soil binding agent: 1 pound per 1,000 square feet or as recommended by supplier.

Do not hydroseed during windy weather or when temperatures are below 55 degrees f. Seeding season is March 1 to October 31, when supplemented with water. Do not hydroseed before or after these dates without written approval by the engineer. Under no circumstances will seeding be permitted when ground is frozen, excessively wet, or otherwise un-tillable. Utilize water as carrying agent for equipment that has a continuous built-in agitation system. Equipment with a gear pump is not acceptable. Pump a continuous, nonfluctuating supply of homogenous slurry to provide a uniform distribution of material over designated areas. Promptly re-seed any areas which do not germinate within 14 days.

8-02.3(6)A Compost
8-02.3(6)A is supplemented by the following:

Submit a 1-cubic-foot sample of material and test results for compost proposed for the project. The contractor shall submit and pay for all material testing.

The Contractor will submit results of chemical analysis for analytes shown in Table 1 (below) for compost that is proposed for use at the site. The results must be submitted to the owner for approval at least three weeks prior to the purchase of the material.

Install compost to the average minimum depth of 3 inches within planting area for riparian shrubs. Provide an 18-inch-radius seed-free ring covered with a 3” average minimum depth of compost. Keep compost 3” min. away from trunk of shrub. See landscape restoration planting plans and details for additional information.

Table 1 - Soil Chemical Analytes

Analyte	AETs Marine Sediment Sediment Cleanup Objective (SCO) [1]	Potential Analytical Method [2]
Metals	**mg/kg dw**	
Arsenic	57	EPA 6010/6020
Cadmium	5.1	EPA 6010/6020
Chromium	260	EPA 6010/6020
Copper	390	EPA 6010/6020
Lead	450	EPA 6010/6020
Mercury	0.41	EPA 7471A
Silver	6.1	EPA 6010/6020
Zinc	410	EPA 6010/6020
Organic and Chlorinated Organic Chemicals	**µg/kg dw**	
2,4-Dimethylphenol	29	EPA 8270
2-Methylphenol	63	EPA 8270
4-Methylphenol	670	EPA 8270
Benzoic acid	650	EPA 8270
Benzyl alcohol	57	EPA 8270
Pentachlorophenol	360	EPA 8270
Phenol	420	EPA 8270
1,2,4-Trichlorobenzene	31	EPA 8260/8270
1,2-Dichlorobenzene	35	EPA 8260/8270
1,4-Dichlorobenzene	110	EPA 8260/8270
Dibenzofuran	540	EPA 8270
Hexachlorobenzene	22	EPA 8270
Hexachlorobutadiene	11	EPA 8270/8081
N-nitrosodiphenylamine	28	EPA 8270
Phthalates	**µg/kg dw**	
Bis(2-Ethylhexyl)phthalate	1300	EPA 8270
Butylbenzyl phthalate	63	EPA 8270
Diethyl phthalate	200	EPA 8270
Dimethyl phthalate	71	EPA 8270
Di-n-butyl phthalate	1400	EPA 8270
Di-n-octyl phthalate	6200	EPA 8270
PCBs	**µg/kg dw**	
Total Aroclors	130	EPA 8082
Polycyclic Aromatic Hydrocarbons	**µg/kg dw**	
2-Methylnaphthalene	670	EPA 8270
Acenaphthene	500	EPA 8270
Acenaphthylene	1300	EPA 8270
Anthracene	960	EPA 8270
Fluorene	540	EPA 8270
Naphthalene	2100	EPA 8270
Phenanthrene	1500	EPA 8270
Benz[a]anthracene	1300	EPA 8270
Benzo[a]pyrene	1600	EPA 8270
Benzo[g,h,i]perylene	670	EPA 8270
Chrysene	1400	EPA 8270
Dibenzo[a,h]anthracene	230	EPA 8270
Fluoranthene	1700	EPA 8270
Indeno[1,2,3-c,d]pyrene	600	EPA 8270
Pyrene	2600	EPA 8270
Total benzofluoranthenes	3200	EPA 8270

[1] From Table 8-1 in in Sediment Cleanup User's Manual (SCUM; Ecology 2021).

[2] Potential analytical method that may be used for the constituent analysis. Contractor may used other analytical methods that have reporting limits less than or equal to the SCO. From Appendix D: Table D-1 in Sediment Cleanup User's Manual (SCUM; Ecology 2021).

Notes:
AETs = Apparent effects threshold
mg/kg dw = milligrams per kilogram dry weight
PCBs = polychlorinated biphenyls
µg/kg dw = micrograms per kilogram dry weight

Washngton Department of Ecology (Ecology). 2021. Sediment Cleanup User's Manual (SCUM), Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204 WAC. Toxics Cleanup Program, Olympia, WA. Publication No. 12-09-057.

8-02.3(6)B Fertilizers
8-02.3(6)B is supplemented by the following:

Planting fertilizers shall be phosphate-free and organic, with 50 percent nitrogen in slow-release form. Fertilizer shall be selected based upon the test data analysis. Furnish fertilizer in standard unopened containers with weight, name of intended plant targets, nutrient content, and manufacturer's guaranteed statement of analysis clearly marked, in accordance with state and federal laws. Fertilizer shall be applied at the rate recommended by supplier.

Fertilizer Application - Shrubs and seeded areas: apply fertilizers to shrubs, and seeded areas at rates recommended by the manufacturer. Fertilizer shall be placed in planting pits at time of planting and shall not be broadcast on to soil surface. Efforts shall be taken to avoid fertilizers from coming into contact with waters of the state.

8-02.3(8) Planting
8-02.3(8)A Dates and Conditions for Planting
8-02.3(8)A is supplemented by the following:

Plant Procurement - Within 30 days of award of contract, submit documentation to the owner's representative that all specified plant materials have been ordered and secured. List supplier names, addresses, phone numbers, and the storage/growing location of the materials.

Plant Materials - Plants are to be nursery grown (no collected plants) in climatic conditions similar to the project site and be of a size at least equal to size specified, measured with branches in normal growing position. Measurements, caliper, branching, grading, quality, balling, and burlap are to follow code of standards of American Association of Nurserymen, unless otherwise specified. Washington native plants are to be propagated from western Washington genetic stock. All plant material shall be of accepted size standards as specified in American Standard for Nursery Stock - latest edition. All plants shall be of normal habit of growth, and shall be healthy, vigorous, and free of disease, insect eggs, and larvae. Scientific nomenclature shall conform to standard plant names. Names not present in this listing shall conform to accepted scientific nomenclature in the nursery trade. For shrubs, no less than 10 percent of each variety or species of plant shall be accurately labeled. Plant material labels shall be durable, legible labels stating the correct scientific plant name. All plants shall be at least equal to size specified on plant legends. Oversize plants are acceptable, but without increase in contract price. Shrubs cut back from larger sizes will not be permitted.

Plant Material Installation - Protect plant materials stored on site from weather damage, construction activity, and the public. Protect roots by covering with moist soil and mulch. Water as required to keep roots moist. Plant shrubs per the planting details on the design drawings.

Plant Inspection - The owner's representative must inspect all plant materials at the job site prior to planting. The owner's representative reserves the right to refuse any/all plant material that does not meet the requirements of the drawings and specifications at any time prior to final acceptance. Remove rejected plant material immediately from the site.

Shrubs shall exhibit overall form typical of the species, be uniformly branched with a symmetrical crown, and be sound, vigorous, healthy, and free from disease. Plants with damaged leaders, damaged bark, sunscalds, windburn, disfiguring knots, circling or ground roots, or broken and cut limbs will be rejected.

Container-grown plants shall have been grown in the containers in which they are delivered for at least 6 months, but not over 2 years. Samples must prove no root-bound conditions exist. Root-bound plants and container plants that have cracked or broken balls of earth when taken from container will be rejected except upon written approval by the engineer.

Plant Layout - Verify the locations of all elements of the landscape installation prior to installation. Owner's representative reserves the right to adjust the locations of landscape elements during the installation period as appropriate.

Riparian Shrub Area Plantings - Orient plants for best natural upright appearance and exposure. Completely remove all container materials, including wire baskets, peat pots, ties, and labels, from root balls. Notify the owner's representative of any conditions detrimental to plant growth (such as rubble fill, stones, adverse drainage conditions, or obstructions) before planting.

Notify the owner's representative if underground utilities, solid rock ledges, membranes, fabrics, or other subsurface obstructions are encountered during planting so that alternative planting locations may be selected. Avoid over-excavation of planting pits. Over-excavated pits shall not be used for planting, but rather shall be backfilled and a new planting prepared within close proximity. Add granules of fertilizer to planting pits according to manufacturer's directions.

Planting pits shall be dug to produce vertical sides and flat, uncompacted bottoms. If the sides become glazed, the glazed surface shall be scarified. The size of plant pits shall be as shown on plans. Set plants in center of planting pits, on uncompacted backfill consisting of imported topsoil that has been amended with compost (25 percent compost by weight). Prune broken roots and stems.

Plants shall have the same relationship with finish grade after settlement as they bore at natural grade. Hold firmly in position and place backfill mixture carefully, avoiding root damage and filling voids. When planting pit is approximately two-thirds full, compact fill by watering to avoid air pockets. Water to settle.

As-built Plan Set - Provide owner's representative with a set of clearly marked prints showing the actual location of all landscape elements prior to the final acceptance of the work. Keep a set of prints on the job site for “red-lining” record information and update said information as needed. Owner's representative reserves the right to review or request copies of such plans at any time during construction.

Coordination - Schedule and coordinate all work with others to avoid interference with the work of others as well as owner's employees.

The dates for planting shall be October 1 through December 15.

8-02.3(9)C Seeding with Fertilizers and Mulches
8-02.3(9)C is supplemented by the following:

Hydroseeding - See design drawings for seed mix composition. Seed furnished for installation shall be the following: at least 90 percent pure and 100 percent free from noxious weed seeds; at least 80 percent pure live seed, grade a, recent crop; treated with appropriate fungicide at time of mixing; stored in a manner to prevent wetting and deterioration; and delivered to the

project site in sealed containers with dealer's guaranteed analysis.

Hydroseeding fertilizer shall be phosphate free and organic, with 50 percent nitrogen in slow-release form, as described in 8-02.3(6)B.

Mulch for hydroseeding shall consist of 50 percent specially processed cellulose fiber (100 percent recycled, post-consumer paper content) and 50 percent wood fiber mulch. Mulch product shall contain no growth or germination-inhibiting factors. Mulch shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a homogeneous slurry. When sprayed on the ground, the material shall allow absorption and percolation of moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content. Mulch shall be chemically inert and nontoxic to plants, humans, and animals.

Soil binding agent shall consist of nontoxic, biodegradable materials that are environmentally safe. Percentage of soil-binding agent shall not be less than 2 percent or greater than 10 percent by weight when mixed with wood fiber mulch.

8-02.3(12) Inspection and Completion of Initial Planting
8-02.3(12) is supplemented by the following:

Final Acceptance - Final acceptance of the landscape work in this section will be made by the owner's representative after an inspection to determine 100 percent completion of the contract work and all punch list items.

8-02.3(13) Plant Establishment
8-02.3(13) is supplemented by the following:

Maintenance – Provide landscape maintenance beginning at the first installation of plant material and continuing up to final acceptance of the landscape and irrigation installation, including watering, weeding, spraying, fertilizing, resetting of plants, removal of dead or damaged plants, replanting and adjustment of staking.

8-02.3(14) Plant Replacement
8-02.3(14) is supplemented by the following:

Guarantee and Replacement - All materials and workmanship shall be guaranteed up to the time of final acceptance. Re-grade and add or remove topsoil as required to any finished landscape surfaces that have settled or become uneven during the guarantee period. Identify plants to be replaced with flagging and leave plants in place until approved by owner. Perform guarantee inspections a minimum of once a month during guarantee period and furnish the owner with monthly written documentation of all materials flagged, removed, or replaced, as well as their locations, species type, and quantities. Contractor shall replace any dead, damaged, diseased, dying, or missing plant materials at no cost to the owner during the guarantee period. Replacement plants shall be as specified and guaranteed until completion of the guarantee period. Reposition plant material that settles or shifts from upright position during the guarantee period. Guarantee does not apply to plant materials or other work damaged or destroyed by vandalism, vehicular damage by others, or acts of God during the guarantee period. It is the

responsibility of the contractor to assure that the site is receiving proper maintenance during the guarantee period. Owner shall be given 30 days written notice by the contractor to rectify substandard maintenance prior to the contractor rejecting any guarantee claims. Guarantee claims may only be voided due to substandard maintenance if the owner takes no action to correct the identified substandard practices during the 30-day notice period.

Replace rejected or damaged plants at no additional expense to the owner.

Substitutions - Substitutions of plant materials will not be permitted, unless authorized in writing by the owner 30 days prior to scheduled start date of installation. If proof is submitted that a specified plant is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of contract price.

(END OF SECTION)

8-03 Irrigation Systems

8-03.3 Construction Requirements
8-03.3(1) General Requirement
8-03.3(1) is supplemented by the following:

Summary - Furnish all labor, materials, equipment, and related items necessary to complete the work shown on the design drawings and/or specifications to provide solar powered temporary irrigation within the planting zones for lagoon and ditch areas. Work to be performed includes, but is not limited to, the following: provide and install irrigation heads, pipes, quick couplers, fittings, valves, valve boxes, strainer system, backflow device, valve control wire and solar powered controller. Guarantee maintenance and protection and coordinate with separate contractors. Provide all other related items required to complete the work following the best accepted trade practices.

Obtain and pay for all necessary permits and fees required by applicable codes and ordinances for this work that have not been procured by the owner. Comply with all applicable codes, regulations, and ordinances which pertain to this work. Consult with owner or owner's representative if there are questions regarding these requirements.

General Requirements - The irrigation system shall be temporary and solar powered; piping shall be on-grade and secured to grade, located next to the permanent fence. The system shall operate for a period sufficient to establish plant and seeded material and to provide sufficient coverage to prevent soil erosion. No elements of system shall penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap. The system shall be designed to operate correctly at the lowest available operational pressure expected during the year and shall withstand system surges.

During establishment a minimum 2 inches of water, including precipitation, shall be provided to planting areas every 2 weeks from June 1 through September 15. Ensure adequate watering for 100% of the plants to be alive, healthy, established and vigorously growing. Contractor to measure and ensure 2 inches of watering needs are fulfilled and to adjust per weather and site conditions. Watering will be controlled by timers to allow for separate water schedules for each zone. Moisture sensor(s) will be installed that allow for override of the watering schedule. Temporary irrigation shall be winterized in October and de-winterized in April during the first-year warrantee period.

Provide protection of all property, persons, work in progress, structures, existing landscape, and irrigation work to remain, utilities, walls, walks, curbs, paved surfaces, drainage materials, water proofing membrane, and all survey markers and monuments from damages incurred arising from this contract. The contractor shall pay for any such damage at no additional cost to owner. Verify locations of all underground utilities prior to commencement of work. Locations of existing known utilities shown on design drawings are approximate locations. The contractor shall be responsible for the protection of said utilities. Promptly notify the owner's representative of any conflict between proposed work and obstructions.

Where irrigation mainlines cross access roads / driveways, utilize portable rubber pipe and hose ramps (such as SAFETYM8 – 2 Channel Drop Over Rubber Hose Ramp 33” by Parking Safe Plus or approved equal), to protect pipes from damage from vehicle tires and equipment.

Coordination - During the entire construction period, schedule and coordinate all work to avoid interference with work of others. Schedule work hours, staging areas, access routes, parking, utility connections, and similar items under the direction of the engineer or owner's representative.

Submit a temporary solar powered irrigation plan, including power assumption calculations, for approval by the engineer or owner's representative at least 10 working days prior to ordering the materials for the irrigation system. The plan shall describe the methods, materials, and manufactures list for construction both graphically and in writing. The plan shall show diagrammatic layout based on the irrigation concept plan provided. Actual layout will be adjusted per actual field conditions.

Submit to owner's representative a schedule of watering and maintenance activities to be performed by contractor during the construction and maintenance period of the contract. The schedule shall delineate specific activities and their frequency during the period between time of initial work and final acceptance and shall be submitted to the engineer prior to provisional acceptance.

8-03.3(2) Submittals
8-03.3(2) is supplemented by the following:

Final Acceptance - Complete all punch list items and submit signed and approved sprinkler/plumbing/health/electrical permits as applicable for final acceptance.

8-03.2 Materials
8-03.2 is supplemented by the following:

Backflow Prevention Assembly (BPA) - All water services shall have a county-approved BPA. Installation shall comply with applicable health and safety codes and contractor shall contact Skagit Public Utilities District for inspection after BPA is installed and tested. Install a “Y”-strainer to protect the BPA and install schedule 40 PVC ball valves at inlet and outlet to drain BPA for winterizing. Pipe upstream of the BPA shall be schedule 40 PVC and pipe immediately downstream of the BPA shall be schedule 40 PVC.

Plastic Pipe - PVC class 200 shall be used for all lateral piping (downstream from valves) and schedule 40 for pressure lines. Pipe to be marked with manufacturer's name, class of pipe, National Sanitation Foundation (NSF) seal, and date and shift of manufacturing run. Pipe to bear no evidence of interior or exterior extrusion marks. Pipe walls to be uniform, smooth, and glossy. Pipe may be pre-belled or with individual solvent-weld couplings. Fittings: schedule 40, full size. Sleeving: PVC schedule 40 or better.

Control Valves - Control valves shall be manifold where feasible, group together in valve boxes or individually installed in single valve box. Valves shall be slow closing design, and automatically close in the event of power failure. Valves shall be sized to provide adequate pressure differential for proper operation. Valves may be battery operated. PVC pipe upstream of the control valves shall be schedule 40. PVC pipe immediately downstream of the valves shall be class 200.

Sprinkler Heads - Heads of different manufacturers or of different basic types (bubbler, stream,

standard, low flow rate, impact, etc.) shall have consistent operating characteristics on any single lateral circuit. Heads on same lateral circuit shall be balanced for matched precipitation rates within five percent from the average for any different arcs of coverage or operating radii. Sprinkler heads shall be designed so that spray adjustments can be made by either an adjustment screw or interchangeable nozzles (such as the TORO 300 Series Multi-stream shrub rotators with low gpm nozzles [shown in concept plan] or approved equal).

Controllers - Controllers shall be compatible with solar power and installed in weather-proof enclosures. Controllers will be installed "freestanding" unless otherwise approved in writing. They shall be located at a prime observation area with good access and be free from irrigation overspray. Controllers will not be required when battery-operated valves with built-in timers are used.

Isolation Valve - Provide up to two mainline isolation valves to be located upstream from the backflow preventer. Valve shall be schedule 40 PVC. Provide valves to divide the irrigation system into controllable units, and to avoid draining long runs of piping for system repairs.

Control Wire - Wire shall be #14 UF direct burial wire. The common wire shall be white, the valve impulse wire shall be red, the master valve wire shall be yellow, with a fourth color of wire provided as a spare. Wire shall not be required with use of battery-operated valves.

Risers shall be fixed schedule 40 and firmly staked.

Quick Coupling Valves - Provide a quick coupler with lid for blow out.

Valve Boxes - Provide standard 12-inch valve box for all valves; 6-inch valve box for quick couplers and gate valves.

Drain Valves - Provide inlet and outlet drain valves to sufficiently winterize system. Other drainage features may be added as necessary to winterize system.

Soil Moisture Sensor – Utilize Rainbird SMRT-Y Soil Moisture Sensor, or approved equal, to allow for override of the watering schedule.

Pipe and Hose Ramps – Where irrigation main line pipes cross access road driveways utilize or install portable rubber pipe and hose ramps such as the SAFETYM8 – 2 Channel Drop Over Rubber Hose Ramp 33” by Parking Safe Plus (or approved equal) to protect irrigation line from vehicle tires.

8-03.3(3) Layout of Irrigation System
8-03.3(3) is supplemented by the following:

Layout - Verify the locations of all elements of the landscape installation prior to installation. The owner's representative reserves the right to adjust the locations of landscape elements during the installation period as appropriate.

8-03.3(4) Irrigation Water Service
8-03.3(4) is supplemented by the following:

Water Supply – The point of connection (POC) shall be furnished by the owner. Test the point of connection to determine the available pressure and gallons per minute prior to installation of the irrigation system. Water supply shall be clean and free of suspended particles, algae, or chemicals that may form insoluble precipitates in the equipment or may be detrimental to plantings.

Verify in writing to the engineer that adequate water flow volume and pressure are available to properly operate the irrigation system prior to installation of the irrigation system.

8-03.3(7)B Irrigation Sleeves
8-03.3(7)B is supplemented by the following:

Sleeving - No sleeves shall be installed under paved surfaces above the landfill cap. If sleeves are necessary under paved surfaces, notify project engineer and obtain approval prior to trenching, boring or installation. If sleeves are necessary, they shall be a minimum of twice the insert pipe diameter. Wire sleeves shall be a minimum of 2 inches in diameter.

8-03.3(9) Irrigation System Installation
8-03.3(9)A General
8-03.3(9)A is supplemented by the following:

Substitutions - Upon acceptance by engineer of the temporary solar powered irrigation plan prepared by the contractor, no material substitutions shall be made without written approval of the engineer or owner's representative.

Cleanup - Clean all paved surfaces and planted areas of soil and debris on a daily basis. Clean all paved surfaces affected by irrigation work prior to final acceptance. Clean up spills of glues and solvents immediately and report them immediately to the project engineer.

Maintenance - Provide maintenance of the irrigation system until 30 days beyond final acceptance. Maintenance shall include head and nozzle adjustment, setting and adjusting controller times, and replacing defective materials.

Guarantee and Replacement - All materials and workmanship shall be guaranteed for a period of one year. Guarantee period shall commence at the time of final acceptance of the irrigation installation. This guarantee period does not apply to work or damage done to the system by others after final acceptance.

Pipe Fittings - Transport and store pipe on a flat even surface. Seal all threaded joints with Teflon tape. No PVC shall be threaded or connected to a threaded fitting without an adapter. Keep pipe free from dirt or debris at all times. Cover ends of pipe when not in progress of installation. Connect pipe using two-step solvent weld process. Do not move or handle pipe for a minimum of 15 minutes while solvent welds are curing. No water shall be permitted in pipe until a period of at least 10 hours has elapsed for solvent welds to sit and cure. The joints shall be allowed to cure at least 24 hours before pressure is applied to the system.

8-03.3(9)B Irrigation Heads
8-03.3(9)B is supplemented by the following:

Sprinklers - Install sprinklers aboveground and secure to prevent from leaning or falling over. Install sprinkler heads perpendicular to finish elevation.

Risers shall be set a minimum of 18 inches above finish grade. Secure each riser to prevent movement; riser shall be plumb to adjacent grade. Avoid using stakes. If stakes are required obtain approval from project engineer prior to installation and ensure no elements penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap.

8-03.3(9)C Valve, Valve Boxes, Hose Bibs
8-03.3(9)C is supplemented by the following:

Backflow Prevention Assembly (BPA) and Strainer - Install BPA and strainer system per local code requirements. BPA shall be plumbed with unions on each side to facilitate removal during winter months. Flush lines prior to installation of BPA, set BPA with a minimum clearance of 12 inches, and install strainer upstream of the BPA. Install BPA in a location where it will be accessible for periodic testing and maintenance and provide inlet and outlet drain valve on each side of BPA for winterizing. Place BPA between the water meter and irrigation system. BPA assembly shall be kept away from pedestrian and vehicular travel ways and housed within an enclosure.

Quick Coupling Valves - Install fitting between water meter and backflow preventer and secure as necessary. Avoid using stakes. If stakes are required obtain approval from project engineer prior to installation and ensure no elements penetrate finish grade elevation more than 1 foot to ensure integrity of landfill cap.

8-03.3(9)E Controller
8-03.3(9)E is supplemented by the following:

Controller - Provide power to the irrigation controller utilizing a solar panel to recharge internal rechargeable battery. Provide all other electrical work necessary to make the equipment operate properly. Mount controller per the manufacturer's specifications in location approved by the owner. Controller will be exterior mounted on a treated 4x4 wooden post, or as directed by project engineer. Assure that no elements penetrate the finish grade elevation more than 1 foot to ensure integrity of landfill cap. Sequence the valves per the number system on the plans. Affix a weatherproof copy of sequence diagram to the inside of the controller cabinet door. Provide copy of valve sequence in the operations manual.

8-03.3(9)G Electrical Wire Installation
8-03.3(9)G is supplemented by the following:

Control Wiring - Install control wires in continuous runs and tape wires in bundles at 10-foot intervals. Tape bundles to the bottom of mainline at 10-foot intervals. Provide a 24-inch loop of excess control wire at each valve box. All wire splices shall be made with a waterproof, direct-bury connector. Provide a separate color-coded common wire and control wire from the master valve to the satellite controller. If more than one satellite controller is assigned to the same master valve, provide a separate color-coded common control wire from each additional satellite controller to the master satellite.

8-03.3(10) Flushing and Testing
8-03.3(10)A General Testing Requirements
8-03.3(10)A is supplemented by the following:

Inspections - Provide 48-hour notice for inspection of head layout, pressure tests, and performance tests.

8-03.3(10)B Mainline or Lateral Flushing
8-03.3(10)B is supplemented by the following:

Flushing - Flush all mainlines once prior to the installation of the valves, and again after the installation of the valves and prior to pressure testing. Flush all lateral lines prior to installation of sprinkler nozzles.

8-03.3(10)C Mainline or Lateral Hydrostatic Pressure Testing
8-03.3(10)C is supplemented by the following:

Pressure Test - Leave all joints and connections exposed until after completion and acceptance of pressure test. Entire mainline shall be capped and pressurized to 100 psi for a period of 2 hours. Visually check all joints and connections for leaks. Repair any visible leaks.

Performance Tests - Operate the system in the presence of the engineer or owner's representative. Owner's representative or engineer may request that up to 5 percent of total nozzles be replaced, as appropriate to site conditions, at no additional cost to owner.

8-03.3(13) As-Built Plans, M&O Manuals, and Operating Tools
8-03.3(13)A As-Builts
8-03.3(13)A is supplemented by the following:

Owner Inspection - Prior to final acceptance of the work, provide the owner with all keys, tools, and maintenance manuals necessary to operate / deactivate the irrigation system. The contractor shall train and instruct owner as to the operation and maintenance of the irrigation system.

As-Built Plan Set - Prior to the final acceptance of the work, provide the owner's representative with a set of clearly marked plans showing actual locations of irrigation elements. Keep a set of plans on job site for “red-lining” record information and update said information as needed. Owner's representative reserves the right to review or request copies of such plans at any time during construction.

8-03.3(13)B Maintenance & Operations Manuals
8-03.3(13)B is supplemented by the following:

Supply engineer with four sets of irrigation system operating and maintenance instructions (in three-ring binders). The manual shall include as-built drawing of the temporary irrigation

system, control settings, a valve sequence operation diagram, list of installed parts, and recommended spare parts list for all equipment installed at the facility prior to the start of the system checkout. The four copies shall be neat, clean copies and include catalogs and shop drawings where applicable. Information for other models or equipment not supplied shall be omitted or crossed out.

8-03.3(14)B Irrigation System Orientation Meeting
8-03.3(14)B is supplemented by the following:

Training - Provide control system programming and operations training to the engineer and/or owner's representative prior to final acceptance.

(END OF SECTION)

APPENDIX B

SKAGIT COUNTY NOXIOUS WEED LIST

Classes of Noxious Weeds

Class A

Class A Noxious Weeds are non-native species whose distribution in Washington State is still limited.

- Eradicating existing infestations and preventing new infestations are the highest priority.

Eradication of all Class A plants is required by law.

Class B

Class B noxious weeds are nonnative species whose distribution is limited to portions of Washington State.

- Species are designated for control in state regions where they are not yet widespread. Prevention of new infestations in these areas is the primary goal.
- In regions where a Class B species is already abundant, control is decided at the local level. Containment of these weeds is the primary goal so that they do not spread into un-infested regions.
- **The Washington State Noxious Weed Board or a County Noxious Weed Board can designate a Class B noxious weed for mandatory control.**

Class B designations at the state level are listed in WAC 16-750-011 and are based on our designation region map.

Class C

Class C noxious weeds are either already widespread in Washington or are of special interest to the agricultural industry.

- The Class C status allows a county to enforce control if it is beneficial to that county (*for example*: to protect crops).

Other counties may choose to provide education or technical support for the removal or control of these weeds.

The Laws

RCW 17.10

RCW 17.10 (Revised Code of Washington) is the state's basic weed law.
The Washington Administrative Code (WAC) contains the rules and regulations needed to carry out state law.

WAC Chapter 16-750

WAC Chapter 16-750 includes the state Noxious Weed List, definitions and descriptions of region boundaries for Class B weeds, and the schedule of monetary penalties.

WAC Chapter 16-752

WAC Chapter 16-752 describes the quarantine list maintained by the state Department of Agriculture. (The state law that calls for the creation and maintenance of the quarantine list is RCW 17.24.)

Quarantine List

The Washington State Department of Agriculture (WSDA) maintains a quarantine list of plants, also called the prohibited plants list, whose sale or distribution is prohibited in the state. All Class A Noxious Weeds are on this list. There are also plants on the list to prevent them from being imported and spread in our state.

Skagit County Noxious Weed Control Board

1800 Continental Place
Mount Vernon, WA 98273
Phone: 360-416-1467
Fax: 360-770-2694
Webpage: https://www.skagitcounty.net/Departments/Noxiousweeds/main.htm

E-mail: mloy@co.skagit.wa.us

The Washington State Noxious Weed List is updated annually. Everyone is encouraged to participate in the process. For additional information, contact:

Washington State Noxious Weed Control Board
PO BOX 42560 Olympia, WA 98504-2560
(360) 902-2053
Website: www.nwcb.wa.gov

2024

SKAGIT COUNTY NOXIOUS WEED LIST

Region 2

List arranged alphabetically by: COMMON NAME



Class A Weeds (Eradication is required)	
Common Name	**Scientific Name**
broom, French	*Genista monspessulana*
broom, Spanish	*Spartium junceum*
common crupina	*Crupina vulgaris*
cordgrass, common	*Spartina anglica*
cordgrass, dense-flowered	*Spartina densiflora*
cordgrass, salt meadow	*Spartina patens*
cordgrass, smooth	*Spartina alterniflora*
dyer's woad	*Isatis tinctoria*
eggleaf spurge	*Euphorbia oblongata*
false brome	*Brachypodium sylvaticum*
floating primrose-willow	*Ludwigia peploides*
flowering rush	*Butomus umbellatus*
garlic mustard	*Alliaria petiolata*
giant hogweed	*Heracleum mantegazzianum*
goatsrue	*Galega officinalis*
hydrilla	*Hydrilla verticillata*
Johnsongrass	*Sorghum halepense*
knapweed, bighead	*Centaurea macrocephala*
knapweed, Vochin	*Centaurea nigrescens*
kudzu	*Pueraria montana var. lobata*
meadow clary	*Salvia pratensis*
oriental clematis	*Clematis orientalis*
Palmer amaranth	*Amaranthus palmeri*
purple starthistle	*Centaurea calcitrapa*
reed sweetgrass	*Glyceria maxima*
ricefield bulrush	*Schoenoplectus mucronatus*
sage, clary	*Salvia sclarea*
sage, Mediterranean	*Salvia aethiopis*
silverleaf nightshade	*Solanum elaeagnifolium*
small-flowered jewelweed	*Impatiens parviflora*
South American spongeplant	*Limnobium laevigatum*
Syrian bean-caper	*Zygophyllum fabago*
Texas blueweed	*Helianthus ciliaris*
thistle, Italian	*Carduus pycnocephalus*
thistle, milk	*Silybum marianum*
thistle, slenderflower	*Carduus tenuiflorus*
thistle, Turkish	*Carduus cinereus*
variable-leaf milfoil and hybrids	*Myriophyllum heterophyllum*
Class B (Control is required)	
Common Name	**Scientific Name**
blueweed	*Echium vulgare*
Brazilian elodea	*Egeria densa*
bugloss, annual	*Lycopsis arvensis*
bugloss, common	*Anchusa officinalis*
camelthorn	*Alhagi maurorum*
common reed (nonnative genotypes only)	*Phragmites australis*
Dalmatian toadflax	*Linaria dalmatica ssp. dalmatica*
European coltsfoot	*Tussilago farfara*
fanwort	*Cabomba caroliniana*
gorse	*Ulex europaeus*
grass-leaved arrowhead	*Sagittaria graminea*
hairy willowherb	*Epilobium hirsutum*
hanging sedge	*Carex pendula, Carex pendula*
hawkweed oxtongue	*Picris hieracioides*
hawkweed, orange	*Hieracium aurantiacum*
hawkweeds: All nonnative species & hybrids of the meadow subgenus	*Hieracium, subgenus Pilosella*
hoary alyssum	*Berteroa incana*
houndstongue	*Cynoglossum officinale*
indigobush	*Amorpha fruticosa*
knapweed, black	*Centaurea nigra*
knapweed, brown	*Centaurea jacea*
knapweed, diffuse	*Centaurea diffusa*
knapweed, meadow	*Centaurea × gerstlaueri*
knapweed, Russian	*Rhaponticum repens*
knapweed, spotted	*Centaurea stoebe*
knotweed, Bohemian	*Fallopia × bohemica*
knotweed, giant	*Fallopia sachalinensis*
knotweed, Himalayan	*Persicaria wallichii*
knotweed, Japanese	*Fallopia japonica*
kochia	*Bassia scoparia*
loosestrife, garden	*Lysimachia vulgaris*
Malta starthistle	*Centaurea melitensis*
parrotfeather	*Myriophyllum aquaticum*
perennial pepperweed	*Lepidium latifolium*
poison hemlock	*Conium maculatum*
policeman's helmet	*Impatiens glandulifera*
puncturevine	*Tribulus terrestris*
rough chervil	*Chaerophyllum temulum*
rush skeletonweed	*Chondrilla juncea*
saltcedar	*Tamarix ramosissima*
Scotch broom	*Cytisus scoparius*
shiny geranium	*Geranium lucidum*
spurge laurel	*Daphne laureola*
spurge, leafy	*Euphorbia virgata*
spurge, myrtle	*Euphorbia myrsinites*
sulfur cinquefoil	*Potentilla recta*
tansy ragwort	*Jacobaea vulgaris*
thistle, musk	*Carduus nutans*
thistle, plumeless	*Carduus acanthoides*
thistle, Scotch	*Onopordum acanthium*
velvetleaf	*Abutilon theophrasti*
water primrose	*Ludwigia hexapetala*
white bryony	*Bryonia alba*
wild basil	*Clinopodium vulgare*
wild chervil	*Anthriscus sylvestris*
yellow archangel	*Lamiastrum galeobdolon*
yellow floating heart	*Nymphoides peltata*
yellow starthistle	*Centaurea solstitialis*
Class B (Control is not required)	
Common Name	**Scientific Name**
butterfly bush	*Buddleja davidii*
common fennel, (except bulbing fennel)	*Foeniculum vulgare except F. vulgare var. azoricum)*
common tansy	*Tanacetum vulgare*
Eurasian watermilfoil	*Myriophyllum spicatum*
herb-Robert	*Geranium robertianum*
lesser celandine	*Ficaria verna*
loosestrife, purple	*Lythrum salicaria*
loosestrife, wand	*Lythrum virgatum*
Ravenna grass	*Tripidium ravennae*
hawkweeds: All nonnative species & hybrids of the wall subgenus	*Hieracium, subgenus Hieracium*
spurge flax	*Thymelaea passerina*
yellow nutsedge	*Cyperus esculentus*
Class C (Control is required)	
Common Name	**Scientific Name**
common teasel	*Dipsacus fullonum*
Italian arum	*Arum italicum*
thistle, bull	*Cirsium vulgare*
thistle, Canada	*Cirsium arvense*
Class C (Control is not required)	
Common Name	**Scientific Name**
absinth wormwood	*Artemisia absinthium*
Austrian fieldcress	*Rorippa austriaca*
babysbreath	*Gypsophila paniculata*
beach grass, European, American, and hybrids	*Ammophila arenaria, A. breviligulata, and A. arenaria x*
black henbane	*Hyoscyamus niger*
blackberry, evergreen	*Rubus laciniatus*
blackberry, Himalayan	*Rubus bifrons*
blackgrass	*Alopecurus myosuroides*
buffalobur	*Solanum rostratum*
cereal rye	*Secale cereale*
common barberry	*Berberis vulgaris*
common catsear	*Hypochaeris radicata*
common groundsel	*Senecio vulgaris*
common St. Johnswort	*Hypericum perforatum*
curly-leaf pondweed	*Potamogeton crispus*
English hawthorn	*Crataegus monogyna*
English ivy 4 cultivars only:	*Hedera hibernica 'Hibernica', Hedera helix 'Baltica', Hedera*
Eurasian watermilfoil hybrid	*Myriophyllum spicatum x M.*
field bindweed	*Convolvulus arvensis*
fragrant water lily	*Nymphaea odorata*
green alkanet	*Pentaglottis sempervirens*
hairy whitetop	*Lepidium appelianum*
hoary cress	*Lepidium draba*
Japanese eelgrass	*Nanozostera japonica*
jointed goatgrass	*Aegilops cylindrica*
jubata grass	*Cortaderia jubata*
lawnweed	*Soliva sessilis*
longspine sandbur	*Cenchrus longispinus*
Medusahead	*Taeniatherum caput-medusae*
nonnative cattail species and hybrids	*Including, but not limited to, Typha angustifolia, T.*
old man's beard	*Clematis vitalba*
oxeye daisy	*Leucanthemum vulgare*
pampas grass	*Cortaderia selloana*
perennial sowthistle	*Sonchus arvensis ssp. arvensis*
reed canarygrass	*Phalaris arundinacea*
Russian olive	*Elaeagnus angustifolia*
scentless mayweed	*Tripleurospermum inodorum*
smoothseed alfalfa dodder	*Cuscuta approximata*
spikeweed	*Centromadia pungens*
spiny cocklebur	*Xanthium spinosum*
spotted jewelweed	*Impatiens capensis*
Swainsonpea	*Sphaerophysa salsula*
tree-of-heaven	*Ailanthus altissima*
ventenata	*Ventenata dubia*
white cockle	*Silene latifolia*
wild carrot (except subs. sativus where grown commercially or for food)	*Daucus carota*
yellow flag iris	*Iris pseudacorus*
yellow toadflax	*Linaria vulgaris*

APPENDIX G

INADVERTENT DISCOVERY PLAN

INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): March Point Landfill Site

Location: Anacortes

Project Lead/Organization:
Koorus Tahghighi/WSP

County: Skagit

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The Inadvertent Discovery Plan (IDP) outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Washington Executive Order 21-02 or Section 106 [36 Code of Federal Regulations Part 800]).

Once completed, **the IDP shall always be kept at the project site** during all project activities. All staff, contractors, and volunteers shall be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic artifacts. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move them***.

- Buried railroad tracks, decking, foundations, or other industrial materials.
- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington State Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact	Alternate Contact
Name: Koorus Tahghighi	Name: Cliff Whitmus
Organization: WSP	Organization: WSP
Phone: 206-641-6301	Phone: 206-300-0520
Email: koorus.tahghighi@wsp.com	Email: cliff.whitmus@wsp.com

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager

Name: Amy Hargrove
Program: Ecology
Phone: 360-402-4217
Email: ahar461@ECY.WA.GOV

Alternate or Cultural Resource Contact

Name: Erik D. Anderson, Cultural Resources Specialist
Program: WSP
Phone: 206-330-6256
Email: erik.anderson@wsp.com

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe: Swinomish
Name: Josephine Jefferson
Title: Tribal Historic Preservation Officer
Phone: 360-466-7352
Email: jjefferson@swinomish.nsn.us

Tribe: Lummi
Name: Lena Tso
Title: Tribal Historic Preservation Officer
Phone: 360-312-2257
Email: lenat@lummi-nsn.gov

Tribe: Tulalip
Name: Richard Young
Title: Cultural Resources Officer
Phone: 360-716-2652
Email: ryoung@tulaliptribes-nsn.gov

Tribe: Samish
Name: Jackie Ferry
Title: Tribal Historic Preservation Officer
Phone: 360-293-6404
Email: jferry@samishtribe.nsn.us

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:

Agency:
Name:
Title:
Phone:
Email:

State Agency:

Agency:
Name:
Title:
Phone:
Email:

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL REMAINS

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: Revised Code of Washington (*RCW) 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):

   - Local Medical Examiner or Coroner name and phone:
     Hayley L. Thompson, Skagit County Coroner, 360-416-1996

- Local Law Enforcement main name and phone:
  Don McDermott, Skagit County Sheriff, 360-416-1911
- Local Non-Emergency phone number (911 if without a non-emergency number):

2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. The Project Lead/Organization may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessments are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

An archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory form. They will photograph site overviews, features, and artifacts and prepare

stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, and interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring that:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the site and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- All field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)
(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Tribal Contacts: Interactive Map of Tribes by Area
(https://dahp.wa.gov/archaeology/tribal-consultation-information)

Tribal Contacts - WSDOT Tribal Contact Website
(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

Additional Tribal Contacts:

Sauk-Suiattle Tribe – Kevin Joseph, kjoseph@sauk-suiattle.com, 360-436-0333

Suquamish Tribe – Dennis Lewarch, dlewarch@suquamish.nsn.us, 360-394-8529

Upper Skagit Tribe – Scott Schuyler, sschuyler@upperskagit.com, 360-854-7009

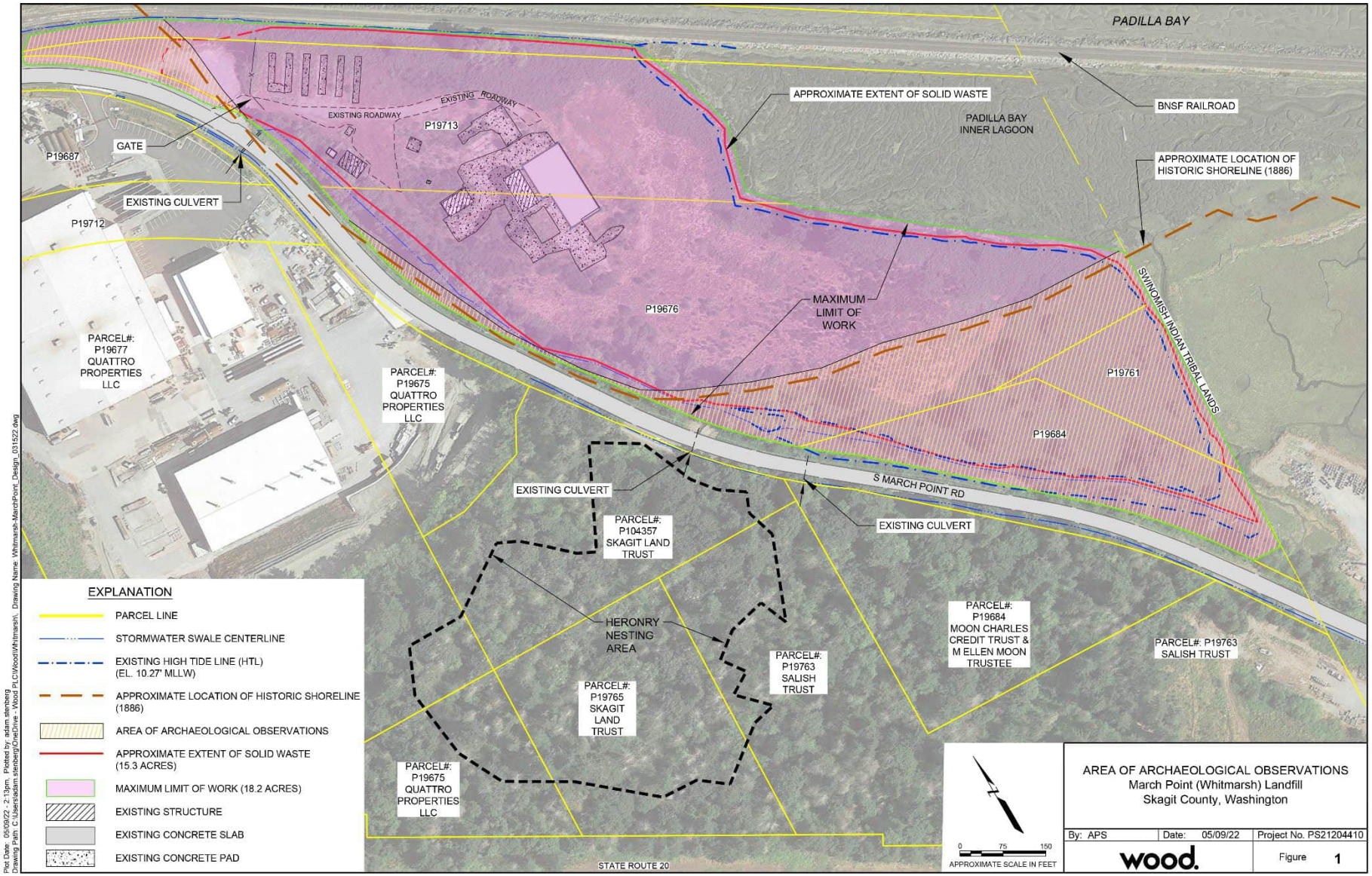
Subsurface archaeological survey and archaeological monitoring carried out by AMEC E&E (now WSP USA Environment & Infrastructure Inc.) did not observe any archaeological materials (Chatters 2009, Cooper and Scott 2011). Pre-contact, Native American activity in the region, particularly resource procurement, typically was concentrated along shoreline areas. The original or historic shoreline from 1886 has been superimposed on the landfill layout to show the approximate location relative to the current site features (Figure 1).

Excavation along the approximate historic shoreline has the potential, although low, for disturbing intact, prehistoric archaeological sites; therefore, all crews working in the vicinity of the historic shoreline as shown on Figure 1 will have training conducted by the project archaeologist prior to excavation work. When working in the vicinity of the historic shoreline, workers will pay particular attention when excavating to the depth of native beach deposits along this alignment. Any material excavated that is associated with the landfill, although individual items may be older than 50 years, will not be considered archaeological as they are within a highly disturbed context.

References

Chatters, J.
2009 Letter to Haddock, D., Archaeological Monitoring of RIFS Sampling in the Whitmarsh Landfill, Skagit County, Washington. AMEC Earth & Environmental, Inc. Seattle, Washington.

Cooper, J., and E. Scott
2011 Results of an Archaeological Survey at the March Point (Whitmarsh) Landfill, City of Anacortes, Skagit County, Washington. AMEC Earth & Environmental, Inc. Seattle, Washington.


PADILLA BAY
APPROXIMATE EXTENT OF SOLID WASTE
BNSF RAILROAD
PADILLA BAY
INNER LAGOON
APPROXIMATE LOCATION OF
HISTORIC SHORELINE (1886)
GATE
P19687
EXISTING CULVERT
P19712
EXISTING ROADWAY
EXISTING ROADWAY
P19713
P19676
MAXIMUM
LIMIT OF
WORK
SWINOMISH INDIAN TRIBAL LANDS
P19761
P19684
PARCEL#:
P19677
QUATTRO
PROPERTIES
LLC
PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC
EXISTING CULVERT
S MARCH POINT RD
EXISTING CULVERT
PARCEL#:
P104357
SKAGIT LAND
TRUST
HERONRY
NESTING
AREA
PARCEL#:
P19763
SALISH
TRUST
PARCEL#:
P19765
SKAGIT
LAND
TRUST
PARCEL#:
P19684
MOON CHARLES
CREDIT TRUST &
M ELLEN MOON
TRUSTEE
PARCEL#: P19763
SALISH TRUST
PARCEL#:
P19675
QUATTRO
PROPERTIES
LLC
STATE ROUTE 20
EXPLANATION
PARCEL LINE
STORMWATER SWALE CENTERLINE
EXISTING HIGH TIDE LINE (HTL)
(EL. 10.27' MLLW)
APPROXIMATE LOCATION OF HISTORIC SHORELINE
(1886)
AREA OF ARCHAEOLOGICAL OBSERVATIONS
APPROXIMATE EXTENT OF SOLID WASTE
(15.3 ACRES)
MAXIMUM LIMIT OF WORK (18.2 ACRES)
EXISTING STRUCTURE
EXISTING CONCRETE SLAB
EXISTING CONCRETE PAD
0
75
150
APPROXIMATE SCALE IN FEET
AREA OF ARCHAEOLOGICAL OBSERVATIONS
March Point (Whitmarsh) Landfill
Skagit County, Washington
By: APS
Date: 05/09/22
Project No. PS21204410
wood.
Figure 1
Plot Date: 05/09/22 - 2:13pm Plotted by: adam.stenberg
Drawing Path: C:\Users\adam.stenberg\OneDrive - Wood PLC\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_Design_031522.dwg

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.



Stone artifacts from Oregon.



Stone artifacts from Washington.



Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.



Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.



Artifacts from unknown locations (left and right images).



Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.









Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants.*

Right: Bone pendants from both Oregon and Washington.



Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.





Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP). These are examples of aboveground cultural resources.*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry.*







Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- "Unusual" accumulations of rock (especially fire-cracked rock).
- "Unusual" shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a "layer cake" appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the "unusual" or out of place (for example, rock piles in areas with otherwise few rocks).



Shell midden pocket in modern fill discovered in sewer trench.



Underground oven. Courtesy of DAHP.

Shell Midden with fire-cracked rock.





Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.







Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*



Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.



Main Image: *Dishes, bottles, work boot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an aboveground resource.*





Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*





Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type, ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.



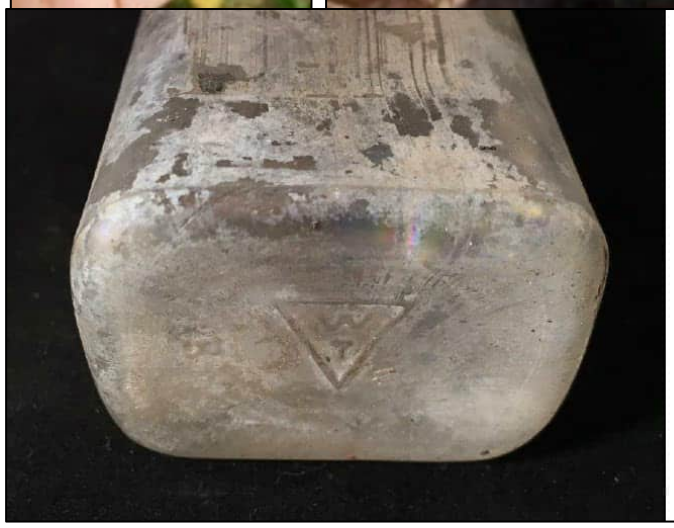


Far Left: *.303 British cartridge found by a WCC planting crew on Skagit River.* ***Don't ever touch something like this!***

Left: *Maker's mark on bottom of old bottle.*



Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*





Logo employed by Whithall Tatum & Co. between 1924 and 1938.



Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

Historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.









Left to Right, Counter Clockwise: *Historic brick structure 45KI924, in WSDOT right of way for State Route 99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology Combined Sewer Overflow excavation. City of Spokane historic trolley tracks (aboveground historic resources) uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see…

Potential human remains.

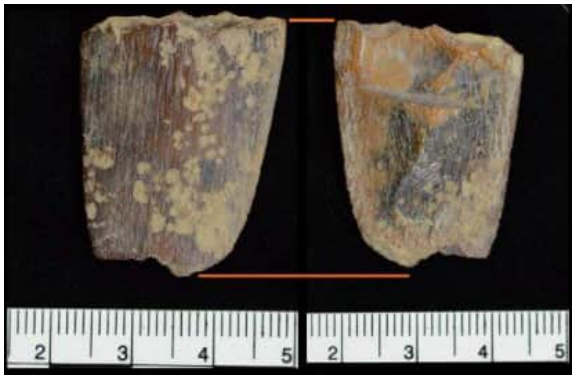
Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.





Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200). Other images (except bottom right) Courtesy of DAHP.*







Directly Above: *This is a real discovery at an Ecology sewer project site.*

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*

APPENDIX H

PROJECT PERMITS

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
4735 EAST MARGINAL WAY SOUTH, BLDG 1202
SEATTLE, WA 98134-2388

November 30, 2022

Regulatory Branch

Skagit County Public Works
Ms. Margo Gillaspy
1800 Continental Place
Mount Vernon, Washington 98273-5625

Reference: NWS-2021-477
Skagit County
Public Works

Dear Ms. Gillaspy:

We have reviewed your application to excavate and backfill in wetlands and Padilla Bay (Inner Lagoon) to facilitate removal and remediation of contaminated sediments near Anacortes, Skagit County, Washington. Based on the information you provided to us, Nationwide Permit (NWP) 38, *Cleanup of Hazardous and Toxic Waste* (Federal Register December 27, 2021 Vol. 86, No. 245), authorizes your proposal as depicted on the enclosed drawings dated October 5, 2021.

In order for this authorization to be valid, you must ensure the work is performed in accordance with the enclosed *NWP 38, Terms and Conditions* and the following special conditions:

a. You must implement and abide by the Endangered Species Act (ESA) requirements and/or agreements set forth in the documents titled, "*Biological Evaluation for Informal ESA Consultation for NWS-2021-477 (Corps Reference Number)*", revision dated March 23, 2022, in their entirety. The U.S. Fish and Wildlife Service (USFWS) concurred with a finding of "may affect, not likely to adversely affect" based on this document on June 8, 2022 (USFWS Reference Number 0lEWFW00-2019-1-1590). Failure to comply with the commitments made in this document constitutes non-compliance with the ESA and your U.S. Army Corps of Engineers permit. The USFWS is the appropriate authority to determine compliance with ESA.

b. In order to meet the requirements of the Endangered Species Act (ESA) and the Magnuson Stevens Fishery Conservation and Management Act (MSA), you must implement and abide by the applicable terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" and the

applicable Essential Fish Habitat Conservation Recommendations as set forth in the Salish Sea Nearshore Programmatic (SSNP) Biological Opinion (BO) (National Marine Fisheries Service (NMFS) Reference Number WCRO-2019-04086) dated June 29, 2022). The specific General Construction Measures, Project Design Criteria, Essential Fish Habitat Conservation Measures, and monitoring and/or reporting requirements applicable to this permit are identified in the enclosed *Notification Summary Sheet* dated November 30, 2022 (NMFS Reference Number WCRO-2019-0466-5158. The BO is available on the U.S. Army Corps of Engineers (Corps) website (https://www.nws.usace.army.mil/Missions/Civil-Works/Regulatory/Permit-Guidebook/Endangered-Species/). You must provide the Corps and NMFS the information requested in the enclosed Notification Summary Sheet. All information must prominently display the reference number NWS-2021-477. Failure to comply with these requirements constitutes non-compliance with the ESA and your Corps permit. The NMFS and USFWS is the appropriate authority to determine compliance with the terms and conditions of their BO and with the ESA. If you cannot comply with the terms and conditions of this programmatic consultation, you must, prior to commencing construction, contact the Corps, Seattle District, Regulatory Branch for an individual consultation in accordance with the requirements of the ESA and/or the MSA.

c. Work waterward of the high tide line (10.27 feet MLLW datum) may only occur when tidal elevations are 8.00 feet (MLLW) or lower. No work may occur when tidal elevations are higher than 8.00 feet (MLLW).

d. Incidents where any individuals of Puget Sound Chinook and Puget Sound steelhead listed by NOAA Fisheries under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the United States or structures or work in navigable waters of the United States authorized by this NWP shall be reported to NOAA Fisheries, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the Seattle District of the U.S. Army Corps of Engineers at (206) 764-3495. The finder should leave the plant or animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure or some unnatural cause. The finder may be asked to carry out instructions provided by NOAA Fisheries, Office of Protected Resources, to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

We have reviewed your project pursuant to the requirements of the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act and the National Historic Preservation Act. We have determined this project complies with the requirements of these laws provided you comply with all of the permit general and special conditions.

Please be reminded that Special Condition “b” of your permit requires that you implement and abide by the Endangered Species Act (ESA) requirements set forth in the programmatic Biological Opinion (BO) for this project. In particular, within 60 days of completing the project you must provide a copy of the Certificate of Compliance with Department of Army Permit and, if the work area is isolated, a fish salvage report (if no fish were captured). All project compliance reports are to be submitted electronically to the Corps at nws.compliance@usace.army.mil, NMFS SSNP mailbox at ssnp-wa.wcr@noaa.gov, and USFWS at WashingtonFWO@fws.gov

The authorized work complies with the Washington State Department of Ecology’s (Ecology) Water Quality Certification (WQC) requirements and Coastal Zone Management (CZM) consistency determination decision for this NWP. No further coordination with Ecology for WQC and CZM is required.

You have not requested a jurisdictional determination for this proposed project. If you believe the U.S. Army Corps of Engineers does not have jurisdiction over all or portions of your project you may request a preliminary or approved jurisdictional determination (JD). If one is requested, please be aware that we may require the submittal of additional information to complete the JD and work authorized in this letter may not occur until the JD has been completed.

Our verification of this NWP authorization is valid until March 14, 2026, unless the NWP is modified, reissued, or revoked prior to that date. If the authorized work for the NWP authorization has not been completed by that date and you have commenced or are under contract to commence this activity before March 14, 2026, you will have until March 14, 2027, to complete the activity under the enclosed terms and conditions of this NWP. Failure to comply with all terms and conditions of this NWP verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. You must also obtain all local, State, and other Federal permits that apply to this project.

You are cautioned that any change in project location or plans will require that you submit a copy of the revised plans to this office and obtain our approval before you begin work. Please note that we may need to reinitiate consultation with the National Marine

Fisheries Service and/or U.S. Fish and Wildlife Service in order to authorize any work not already included in the enclosed plans.

Upon completing the authorized work, you must fill out and return the enclosed *Certificate of Compliance with Department of the Army Permit*. All compliance reports should be submitted to the U.S. Army Corps of Engineers, Seattle District, Regulatory Branch electronically at nws.compliance@usace.army.mil. Thank you for your cooperation during the permitting process. We are interested in your experience with our Regulatory Program and encourage you to complete a customer service survey. Referenced documents and information about our program are available on our website at www.nws.usace.army.mil, select “Regulatory Permit Information”.

A copy of this letter with enclosures will be furnished to Mr. Cliff Whitmus of Wood Environment and Infrastructure Solutions, Inc. at cliff.whitmus@woodplc.com. If you have any questions, please contact me at randel.j.perry@usace.army.mil or (360) 734-3156.

Sincerely,

Randel Perry, Project Manager
Regulatory Branch

Enclosures

US Army Corps of Engineers
Seattle District

NATIONWIDE PERMIT 38
Terms and Conditions

2021 NWPs - Final 41; Effective Date: February 25, 2022

A. Description of Authorized Activities
B. U.S. Army Corps of Engineers (Corps) National General Conditions for All Final 41 NWPs
C. Seattle District Regional General Conditions
D. Seattle District Regional Specific Conditions for this Nationwide Permit (NWP)
E. 401 Water Quality Certification (401 WQC) for this NWP
F. Coastal Zone Management Consistency Response for this NWP

In addition to any special condition that may be required on a case-by-case basis by the District Engineer, the following terms and conditions must be met, as applicable, for a Nationwide Permit (NWP) authorization to be valid in Washington State.

A. DESCRIPTION OF AUTHORIZED ACTIVITIES

38. Cleanup of Hazardous and Toxic Waste. Specific activities required to effect the containment, stabilization, or removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal or regulatory authority. Court ordered remedial action plans or related settlements are also authorized by this NWP. This NWP does not authorize the establishment of new disposal sites or the expansion of existing sites used for the disposal of hazardous or toxic waste.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 32.) (Authorities: Sections 10 and 404)

Note: Activities undertaken entirely on a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site by authority of CERCLA as approved or required by EPA, are not required to obtain permits under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act.

B. CORPS NATIONAL GENERAL CONDITIONS FOR ALL 2021 NWPs - FINAL 41

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. Navigation. (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required,

upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. Aquatic Life Movements. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. Spawning Areas. Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. Migratory Bird Breeding Areas. Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. Shellfish Beds. No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. Suitable Material. No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. Water Supply Intakes. No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. Management of Water Flows. To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. Fills Within 100-Year Floodplains. The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. Equipment. Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. Soil Erosion and Sediment Controls. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. Removal of Temporary Structures and Fills. Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. Proper Maintenance. Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. Single and Complete Project. The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. Wild and Scenic Rivers. (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. Tribal Rights. No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. Endangered Species. (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated

critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity "may affect" or will have "no effect" to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps' determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have "no effect" on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word "harm" in the definition of "take" means an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. Migratory Birds and Bald and Golden Eagles. The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Historic Properties. (a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section 106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those

tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. Discovery of Previously Unknown Remains and Artifacts. Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. Designated Critical Resource Waters. Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. Mitigation. The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory

mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements)

may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. Safety of Impoundment Structures. To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. Water Quality. (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. Coastal Zone Management. In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual

coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. Regional and Case-By-Case Conditions. The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:
(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1/3-acre.
(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. Transfer of Nationwide Permit Verifications. If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____
(Transferee)

_____
(Date)

30. Compliance Certification. Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to

satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. Activities Affecting Structures or Works Built by the United States. If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. Pre-Construction Notification. (a) *Timing*. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification*: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination*: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity’s compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity’s adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity’s compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies’ concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

C. SEATTLE DISTRICT REGIONAL GENERAL CONDITIONS: The following conditions apply to the 2021 NWPs - Final 41 NWPs for the Seattle District in Washington State, as applicable.

RGC 1, Project Drawings
Drawings must be submitted with pre-construction notification (PCN). Drawings must provide a clear understanding of the proposed project, and how waters of the United States will be affected. Drawings must be originals and not reduced copies of large-scale plans. Engineering drawings are not required. Existing and proposed site conditions (manmade and landscape features) must be drawn to scale.

RGC 2, Aquatic Resources Requiring Special Protection
A PCN is required for activities resulting in a loss of waters of the United States in wetlands in dunal systems along the Washington coast, mature forested wetlands, bogs and peatlands, aspen-dominated wetlands, alkali wetlands, vernal pools, camas prairie wetlands, estuarine wetlands, and wetlands in coastal lagoons.

RGC 3, New Bank Stabilization in Tidal Waters of Puget Sound
Activities involving new bank stabilization in tidal waters in Water Resource Inventory Areas (WRIAs) 8, 9, 10, 11 and 12 (within the areas identified on Figures 1a through 1e) cannot be authorized by NWP.

RGC 4, Commencement Bay
No permanent losses of wetlands or mudflats within the Commencement Bay Study Area may be authorized by any NWP (see Figure 2).

RGC 5, Bank Stabilization
All projects including new or maintenance bank stabilization activities in waters of the United States where salmonid species are present or could be present, requires PCN to the U.S. Army Corps of Engineers (Corps) (see NWP general condition 32).
For new bank stabilization projects only, the following must be submitted to the Corps:

a. The cause of the erosion and the distance of any existing structures from the area(s) being stabilized.
b. The type and length of existing bank stabilization within 300 feet of the proposed project.
c. A description of current conditions and expected post-project conditions in the waterbody.
d. A statement describing how the project incorporates elements avoiding and minimizing adverse environmental effects to the aquatic environment and nearshore riparian area, including vegetation impacts in the waterbody.

In addition to a. through d., the results from any relevant geotechnical investigations can be submitted with the PCN if it describes current or expected conditions in the waterbody.

RGC 6, Crossings of Waters of the United States
Any project including installing, replacing, or modifying crossings of waters of the United States, such as culverts or bridges, requires submittal of a PCN to the U.S. Army Corps of Engineers (see NWP general condition 32).
If a culvert is proposed to cross waters of the U.S. where salmonid species are present or could be present, the project must apply the stream simulation design method from the Washington Department of Fish and Wildlife located in the *Water Crossing Design Guidelines* (2013), or a design method which provides passage at all life stages at all flows where the salmonid species would naturally seek passage. If the stream simulation design method is not applied for a culvert where salmonid species are present or could be present, the project proponent must provide a rationale in the PCN sufficient to establish one of the following:

a. The existence of extraordinary site conditions.
b. How the proposed design will provide equivalent or better fish passage and fisheries habitat benefits than the stream simulation design method.

Culverts installed under emergency authorization that do not meet the above design criteria will be required to meet the above design criteria to receive an after-the-fact nationwide permit verification.

RGC 7, Stream Loss

A PCN is required for all activities that result in the loss of any linear feet of streams.

RGC 8, Construction Boundaries
Permittees must clearly mark all construction area boundaries within waters of the United States before beginning work on projects that involve grading or placement of fill. Boundary markers and/or construction fencing must be maintained and clearly visible for the duration of construction. Permittees should avoid and minimize removal of native vegetation (including submerged aquatic vegetation) to the maximum extent possible.

RGC 9, ESA Reporting to NMFS
For any nationwide permit that may affect threatened or endangered species;
Incidents where any individuals of fish species, marine mammals and/or sea turtles listed by National Oceanic and Atmospheric Administration Fisheries, National Marine Fisheries Service (NMFS) under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the U.S. or structures or work in navigable waters of the U.S. authorized by this Nationwide Permit verification shall be reported to NMFS, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the Seattle District of the U.S. Army Corps of Engineers at (206) 764-3495. The finder should leave the animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure or some unnatural cause. The finder may be asked to carry out instructions provided by the NMFS to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.

D. SEATTLE DISTRICT REGIONAL SPECIFIC CONDITIONS FOR THIS NWP:

NWP 38 Specific Regional Condition:
1. Non-government project proponents must submit a copy of court ordered remedial plans or related settlements with the pre-construction notification.

E. 401 WATER QUALITY CERTIFICATION: Depending on the geographic region of the work authorized by this verification, the appropriate 401 certifying authority has made the following determinations:

Washington Department of Ecology (Ecology) (Projects in all areas except as described for the other certifying agencies listed below): General and Specific WQC Conditions

A. State General Conditions for all Nationwide Permits

In addition to all of the U.S. Army Corps of Engineers' (Corps) national and Seattle District'sregional permit conditions, the following state general Water Quality Certification (WQC) conditions **apply to all NWPs whether granted or granted with conditions** in Washington where Ecology is the certifying authority.

Due to the lack of site specific information on the discharge types, quantities, and specific locations, as well as the condition of receiving waters and the quantity of waters (including wetlands) that may be lost, Ecology may need to review the project if one of the following stategeneral conditions is triggered.

This case-by-case review may be required, and additional information regarding the project and associated discharges may be needed, to verify that the proposed project would comply with state water quality requirements and if an individual WQC is required or if the project meets this programmatic WQC.

1. **In-water construction activities**. Ecology WQC review is required for projects or activities authorized under NWPs where the project proponent has indicated on the Joint Aquatic Resource Permit Application (JARPA) question 9e that the project or activity will not meet State water quality standards, or has provided information indicating that the project or activity will cause, or

may be likely to cause or contributeto an exceedance of a State water quality standard (Chapter 173-201A WAC) or sediment management standard (Chapter 173-204 WAC).

Note: In-water activities include any activity within a jurisdictional wetland and/orwaters.

2. **Projects or Activities Discharging to Impaired Waters**. Ecology WQC review is required for projects or activities that will occur in a 303(d) listed segment of a waterbody or upstream of a listed segment and may result in further exceedances of the specific listedparameter to determine if the project meets this programmatic WQC or will require individual WQC.

To determine if your project or activity is in a 303(d) listed segment of a waterbody, visitEcology's Water Quality Assessment webpage for maps and search tools.

3. **Aquatic resources requiring special protection**. Certain aquatic resources are unique and difficult-to-replace components of the aquatic environment in Washington. Activities that would affect these resources must be avoided to the greatest extent practicable. Compensating for adverse impacts to high value aquatic resources is typically difficult, prohibitively expensive, and may not be possible in some landscapesettings.

Ecology WQC review is required for projects or activities in areas identified below to determine if the project meets this programmatic WQC or will require individual WQC.

a. Activities in or affecting the following aquatic resources:
    i. Wetlands with special characteristics (as defined in the Washington State Wetland Rating Systems for western and eastern Washington, Ecology Publications #14-06-029 and #14-06-030):
        - Estuarine wetlands.
        - Wetlands of High Conservation Value.
        - Bogs.
        - Old-growth forested wetlands and mature forested wetlands.
        - Wetlands in coastal lagoons.
        - Wetlands in dunal systems along the Washington coast.
        - Vernal pools.
        - Alkali wetlands.

    ii. Fens, aspen-dominated wetlands, camas prairie wetlands.

    iii. Category I wetlands.

    iv. Category II wetlands with a habitat score ≥ 8 points.

b. Activities in or resulting in a loss of eelgrass (Zostera marina) beds.

This state general condition does not apply to the following NWPs:
NWP 20 – Response Operations for Oil and Hazardous Substances
NWP 32 – Completed Enforcement Actions
NWP 48 – Commercial Shellfish Mariculture Activities

4. **Loss of More than 300 Linear Feet of Streambed.** For any project that results in the lossof more than 300 linear feet of streambed Ecology WQC review is required to determineif the project meets this programmatic WQC or will require individual WQC.

5. **Temporary Fills.** For any project or activity with temporary fill in wetlands or other waters for

more than six months Ecology WQC review is required to determine if theproject meets this programmatic WQC or will require individual WQC.

6. **Mitigation.** Project proponents are required to show that they have followed the mitigation sequence and have first avoided and minimized impacts to aquatic resourceswherever practicable. For projects requiring Ecology WQC review or an individual WQC with unavoidable impacts to aquatics resources, a mitigation plan must be provided.

    a. Wetland mitigation plans submitted for Ecology review and approval shall be based on the most current guidance provided in Wetland Mitigation in Washington State, Parts 1 and 2 (available on Ecology's website) and shall, at aminimum, include the following:

        i. A description of the measures taken to avoid and minimize impacts to wetlands and other waters of the U.S.

        ii. The nature of the proposed impacts (i.e., acreage of wetlands and functions lost or degraded).

        iii. The rationale for the mitigation site that was selected.

        iv. The goals and objectives of the compensatory mitigation project.

        v. How the mitigation project will be accomplished, including construction sequencing, best management practices to protect water quality, proposed performance standards for measuring success and the proposed buffer widths.

        vi. How it will be maintained and monitored to assess progress toward goals and objectives. Monitoring will generally be required for a minimum of five years. For forested and scrub-shrub wetlands, 10 years of monitoring will often be necessary.

        vii. How the compensatory mitigation site will be legally protected for the long term.

Refer to Wetland Mitigation in Washington State – Part 2: Developing Mitigation Plans (Ecology Publication #06-06-011b) and Selecting Wetland Mitigation Sites Using a Watershed Approach (Ecology Publications #09-06-032 (Western Washington) and #10-06-007 (Eastern Washington)) for guidance on selecting suitable mitigation sites and developing mitigation plans.

Ecology encourages the use of alternative mitigation approaches, includingcredit/debit methodology, advance mitigation, and other programmatic approaches such as mitigation banks and in-lieu fee programs. If you are interested in proposing use of an alternative mitigation approach, consult with the appropriate Ecology regional staff person. Information on alternative mitigation approaches is available on Ecology's website.

    b. Mitigation for other aquatic resource impacts will be determined on a case-by-case basis.

7. **Stormwater Pollution Prevention**. All projects involving land disturbance or impervious surfaces must implement stormwater pollution prevention or control measures to avoiddischarge of pollutants in stormwater runoff to waters.

    a. For land disturbances during construction, the applicant must obtain and

implement permits (e.g., Construction Stormwater General Permit) where required and follow Ecology's current stormwater manual.

b. Following construction, prevention or treatment of on-going stormwater runofffrom impervious surfaces shall be provided.

Ecology's Stormwater Management and Design Manuals and stormwater permitinformation are available on Ecology's website.

8. **Application**. For projects or activities that will require Ecology WQC review, or anindividual WQC, project proponents must provide Ecology with a JARPA or the equivalent information, along with the documentation provided to the Corps, as described in national general condition 32, Pre-Construction Notification (PCN), including, where applicable:

   a. A description of the project, including site plans, project purpose, direct and indirect adverse environmental effects the project discharge(s) would cause, best management practices (BMPs), and proposed means to monitor the discharge(s).

   b. List of all federal, state or local agency authorizations required to be used for anypart of the proposed project or any related activity.

   c. Drawings indicating the OHWM, delineation of special aquatic sites, and other waters of the state. Wetland delineations must be prepared in accordance with thecurrent method required by the Corps and shall include Ecology's Wetland Rating form. Wetland Rating forms are subject to review and verification by Ecology staff.

   Guidance for determining the OHWM is available on Ecology's website.

   d. A statement describing how the mitigation requirement will be satisfied. A conceptual or detailed mitigation or restoration plan may be submitted. See stategeneral condition 5.

   e. Other applicable requirements of Corps NWP general condition 32, Corps regional conditions, or notification conditions of the applicable NWP.

Ecology **grants with conditions Water Quality Certification** (WQC) for this NWP provided that Ecology individual WQC review is not required per the state general conditions (see above) and the following conditions:

Ecology Section 401 Water Quality Certification – Granted with conditions. Ecology individual WQC is required for projects or activities authorized under this NWP if:

The project or activity is not authorized though a Model Toxics Control Act (MTCA) order or a Comprehensive Environmental Response, Compensation and Liability Act(CERCLA) order

Environmental Protection Agency (EPA) (on Tribal Lands where Tribes Do Not Have Treatment in a Similar Manner as a State and Lands with Exclusive Federal Jurisdiction in Washington):

On behalf of the 28 tribes that do not have treatment in a similar manner as a state and for exclusive federal jurisdiction lands located within the state of Washington, EPA Region 10 has determined that CWA Section 401 WQC for the following proposed NWPs is granted with conditions. EPA Region 10 has determined that any discharge authorized under the following proposed NWPs will comply with water quality requirements, as defined at 40 C.F.R. § 121.1(n), subject to the following conditions pursuant to CWA Section 401(d).

General Conditions:

EPA General Condition 1 – Aquatic Resources of Special Concern

Activities resulting in a point source discharge in the following types of aquatic resources of special concern shall request an individual project-specific CWA Section 401 WQC: mature forested wetlands; bogs, fens and other peatlands; vernal pools; aspen-dominated wetlands; alkali wetlands; camas prairie wetlands; wetlands in dunal systems along the Oregon or Washington Coast; riffle-pool complexes of streams; marine or estuarine mud-flats; salt marshes; marine waters with native eelgrass or kelp beds; or marine nearshore forage fish habitat. To identify whether a project would occur in any of these aquatic resources of special concern, project proponents shall use existing and available information to identify the location and type of resources, including using the U.S. Fish and Wildlife Service's online digital National Wetland Inventory maps, identifying project location on topographical maps, and/or providing on-site determinations as required by the Corps. When a project requires a Pre-Construction Notification (PCN) to the Corps, project proponents shall work with the Corps to identify whether the project is in any of these specific aquatic resources of special concern.

EPA General Condition 2 – Soil Erosion and Sediment Controls

Turbidity shall not exceed background turbidity by more than 50 Nephelometric Turbidity Units (NTU) above background instantaneously or more than 25 NTU above background for more than ten consecutive days.[8] Projects or activities that are expected to exceed these levels require an individual project-specific CWA Section 401 WQC.

The turbidity standard shall be met at the following distances from the discharge:

Wetted Stream Width at Discharge Point	**Approximate Downstream Point to Sample to Determine Compliance**
Up to 30 feet	50 feet
>30 to 100 feet	100 feet
>100 feet to 200 feet	200 feet
>200 feet	300 feet
Lake, Pond, Reservoir	Lesser of 100 feet or maximum surface distance

For Marine Water	**Point of Compliance for Temporary Area of Mixing**
Estuaries or Marine Waters	Radius of 150 feet from the activity causing the turbidity exceedance

Measures to prevent and/or reduce turbidity shall be implemented and monitored prior to, during, and after construction. Turbidity monitoring shall be done at the point of compliance within 24 hours of a precipitation event of 0.25 inches or greater. During monitoring and maintenance, if turbidity limits are exceeded or if measures are identified as ineffective, then additional measures shall be taken to come into compliance and EPA shall be notified within 48 hours of the exceedance or measure failure.

EPA General Condition 3 - Compliance with Stormwater Pollution Prevention and the National Pollutant Discharge Elimination System Permit Provisions

For land disturbances during construction that 1) disturb one or more acres of land, or 2) will disturb less than one acre of land but are part of a common plan of development or sale that will ultimately disturb one or more acres of land, the permittee shall obtain and implement Construction Stormwater General Permit requirements,[9] including:

1. The permittee shall develop a Stormwater Pollution Prevention Plan (SWPPP)[10] and submit it to EPA Region 10 and appropriate Corps District; and
2. Following construction, prevention or treatment of ongoing stormwater runoff from impervious surfaces that includes soil infiltration shall be implemented.

EPA General Condition 4 – Projects or Activities Discharging to Impaired Waters

Projects or activities are not authorized under the NWPs if the project will involve point source discharges into an active channel (e.g., flowing or open waters) of a water of the U.S. listed as impaired under CWA Section 303(d) and/or if the waterbody has an approved Total Maximum Daily Load (TMDL) and the discharge may result in further exceedance of a specific parameter (e.g., total suspended solids, dissolved oxygen, temperature) for which the waterbody is listed or has an approved TMDL. The current lists of impaired waters of the U.S. under CWA Section 303(d) and waters of the U.S. for which a TMDL has been approved are available on EPA Region 10's web site at: https://www.epa.gov/tmdl/impaired-waters-and-tmdls-region-10.

EPA General Condition 5 – Notice to EPA

All project proponents shall provide notice to EPA Region 10 prior to commencing construction activities authorized by a NWP. This will provide EPA Region 10 with the opportunity to inspect the activity for the purposes of determining whether any discharge from the proposed project will violate this CWA Section 401 WQC. Where the Corps requires a PCN for an applicable NWP, the project proponent shall also provide the PCN to EPA Region 10. EPA Region 10 will provide written notification to the project proponent if the proposed project will violate the water quality certification of the NWP.

EPA General Condition 6 – Unsuitable Materials

The project proponent shall not use wood products treated with leachable chemical components (e.g., copper, arsenic, zinc, creosote, chromium, chloride, fluoride, pentachlorophenol), which result in a discharge to waters of the U.S., unless the wood products meet the following criteria:

1. Wood preservatives and their application shall be in compliance with EPA label requirements and criteria of approved EPA Registration Documents under the Federal Insecticide, Fungicide, and Rodenticide Act;
2. Use of chemically treated wood products shall follow the Western Wood Preservatives Institute (WWPI) guidelines and BMPs to minimize the preservative migrating from treated wood into the aquatic environment;
3. For new or replacement wood structures, the wood shall be sealed with non-toxic products such as water-based silica or soy-based water repellants or sealers to prevent or limit leaching. Acceptable alternatives to chemically treated wood include untreated wood, steel (painted, unpainted or coated with epoxy petroleum compound or plastic), concrete and plastic lumber; and
4. All removal of chemically treated wood products (including pilings) shall follow the most recent "EPA Region 10 Best Management Practices for Piling Removal and Placement in Washington State."

Federally recognized tribes located within the state of Washington

EPA Region 10 cannot certify that the range of discharges from potential projects authorized under this NWP will comply with water quality requirements, as defined in 40 CFR 121.1(n). Therefore, CWA Section 401 water quality certification is denied for this NWP and applicants must request an individual water quality certification, consistent with 40 CFR 121.5.

Lands of Exclusive Federal Jurisdiction

EPA Region 10 cannot certify that the range of discharges from potential projects authorized under this NWP will comply with water quality requirements, as defined in 40 CFR 121.1(n). Therefore, CWA Section 401 water quality certification is denied for this NWP and applicants must request an individual water quality certification, consistent with 40 CFR 121.5.

Specific Tribes with Certifying Authority (Projects in Specific Tribal Areas):
WQC was issued by the Swinomish Indian Tribal Community. WQC was waived by the Confederated Tribes of the Chehalis Reservation and Colville Indian Reservation, Kalispel Tribe of Indians, Port Gamble S'Klallam Tribe, Quinault Indian Nation, and the Spokane Tribe of Indians. WQC was denied by the Lummi Nation, Makah Tribe, Puyallup Tribe of Indians, and the Tulalip Tribes; therefore, individual WQC is required from these tribes.

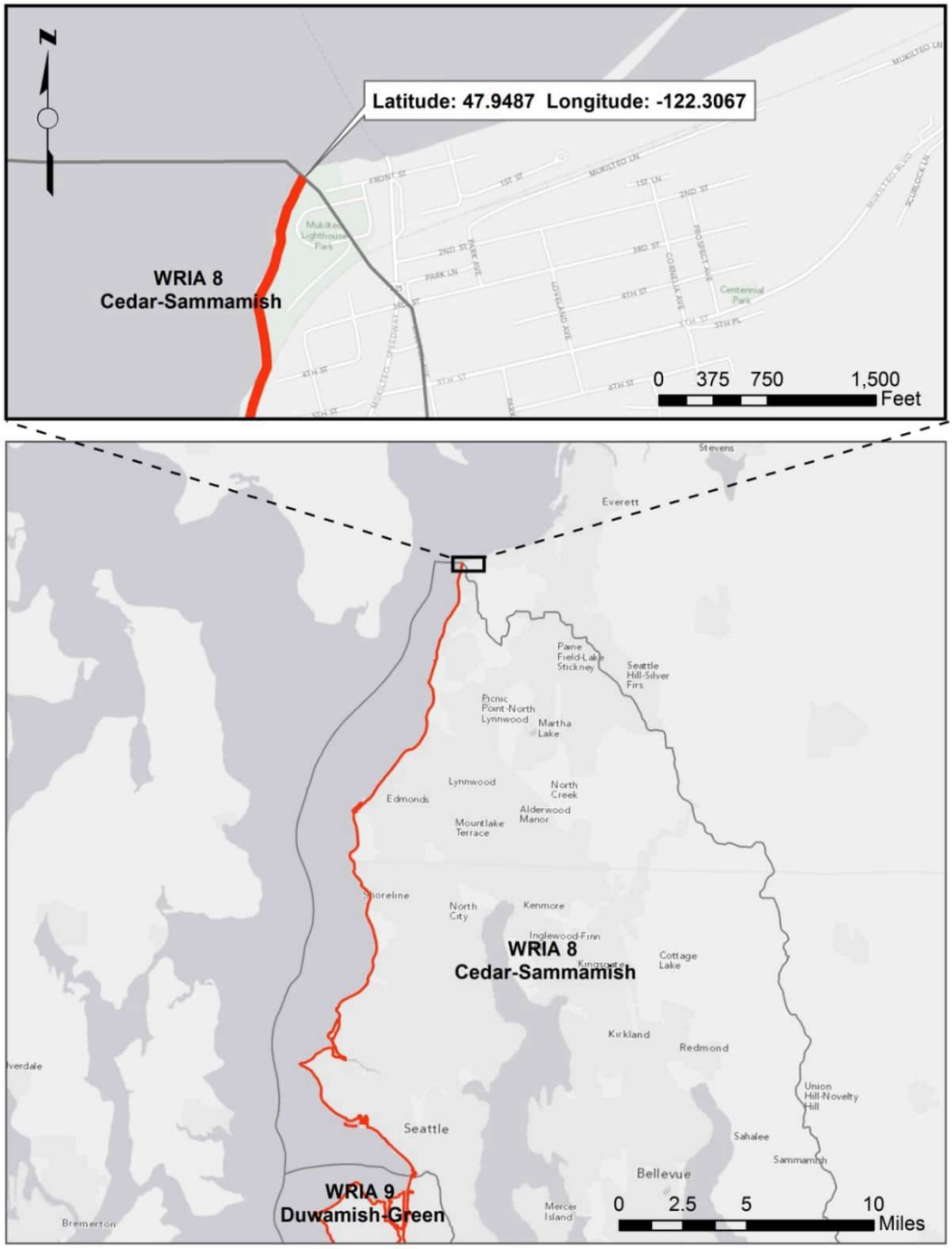
F. COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY RESPONSE FOR THIS NWP:

Ecology's determination is that they concur with conditions that this NWP is consistent with CZMA.

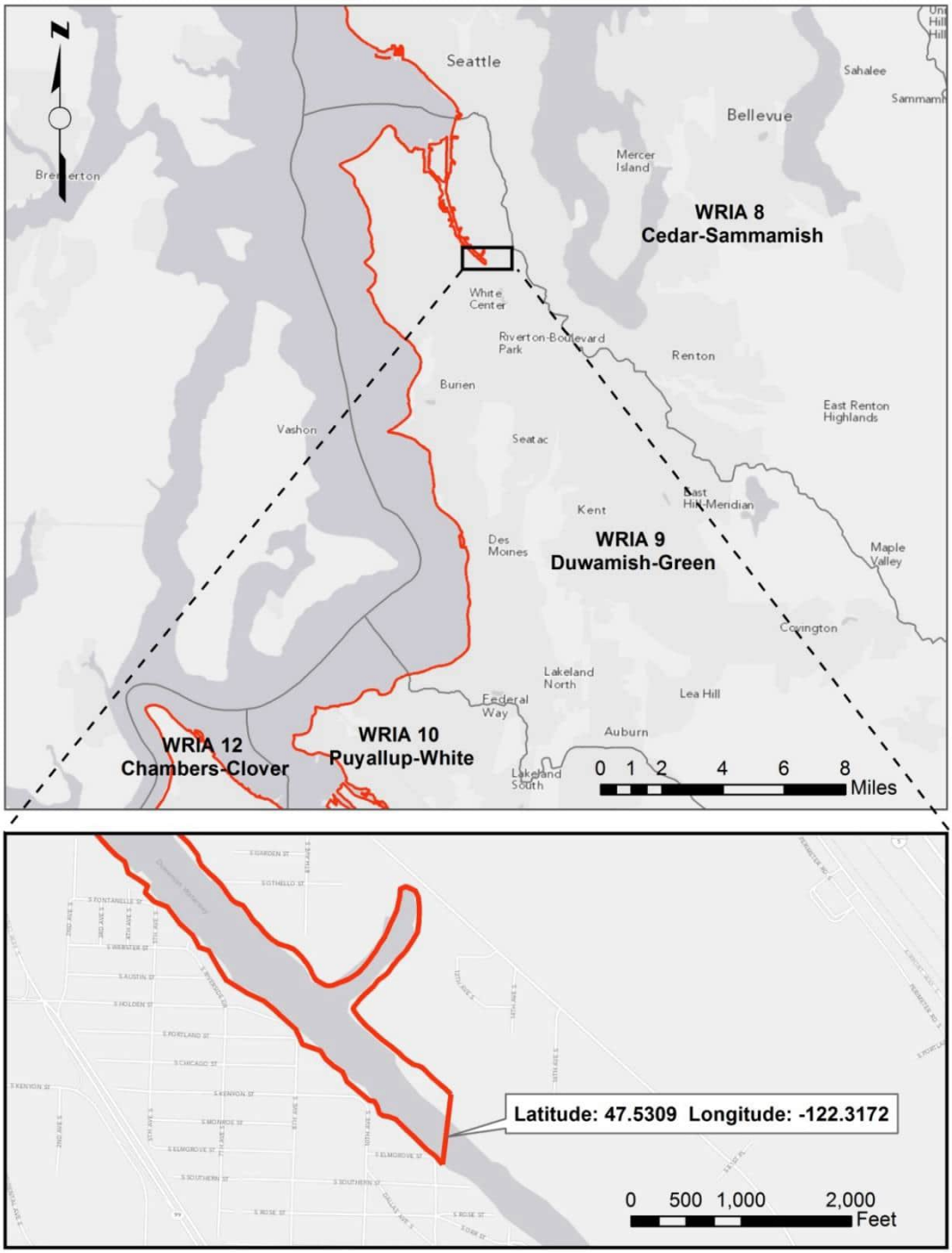
CZM Federal Consistency Response – Concur with Conditions.

1. A CZM Federal Consistency Decision is required for projects or activities under this NWP if a State 401 Water Quality Certification is required.

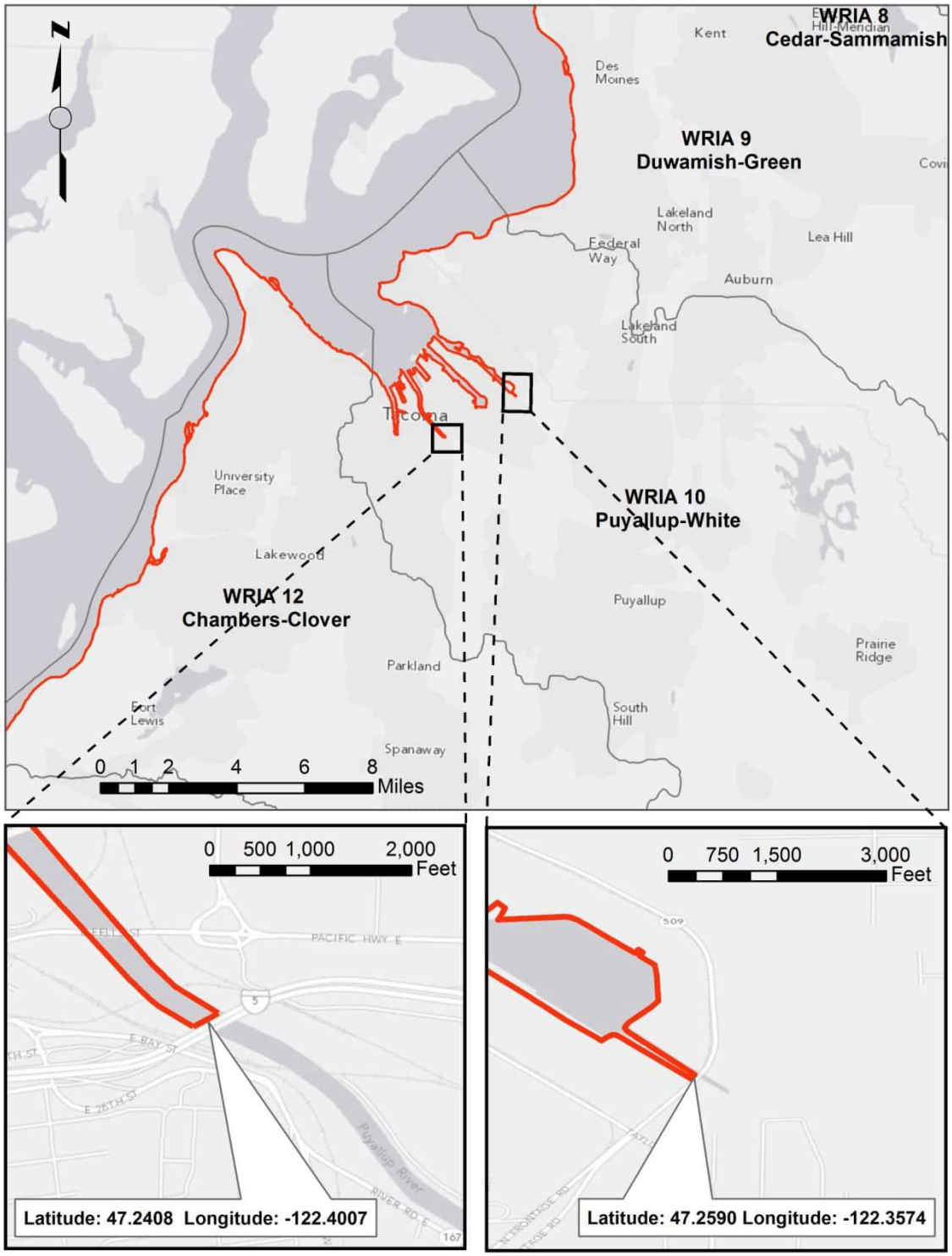
Seattle District Regional General Conditions - Figures
Figure 1: RGC 3 - WRIAs 8, 9, 10, 11, and 12
a. WRIA 8



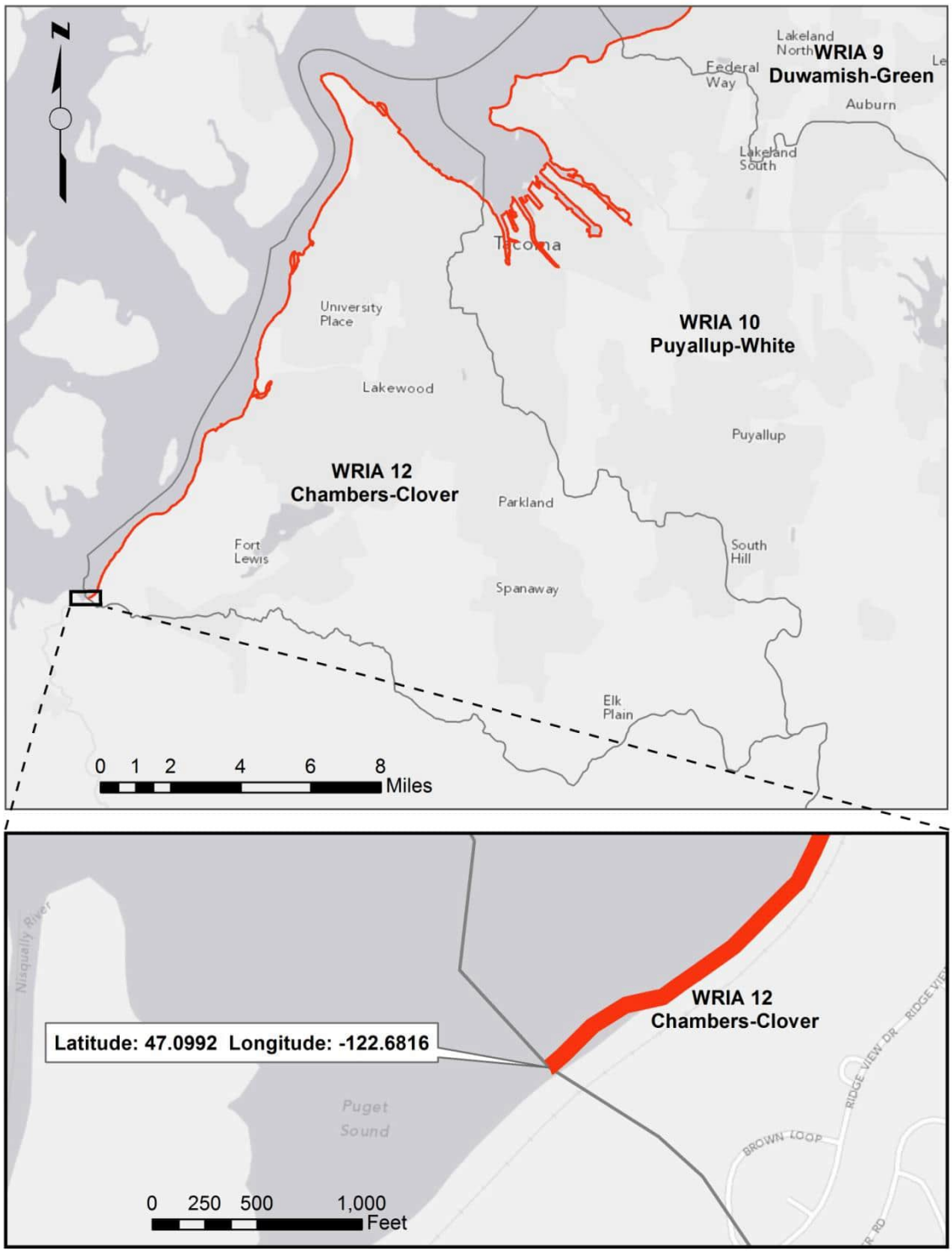
b. WRIA 9


N
Seattle
Bellevue
Sahalee
Mercer Island
WRIA 8
Cedar-Sammamish
White Center
Riverton-Boulevard Park
Renton
Burien
East Renton Highlands
Vashon
Seatac
Kent
Des Moines
WRIA 9
Duwamish-Green
Maple Valley
Covington
Lakeland North
Lea Hill
Federal Way
Auburn
WRIA 12
Chambers-Clover
WRIA 10
Puyallup-White
Lakeland South
0 1 2 4 6 8
Miles
Latitude: 47.5309 Longitude: -122.3172
0 500 1,000 2,000
Feet

c. WRIA 10


N
WRIA 8
Cedar-Sammamish
Kent
Des Moines
WRIA 9
Duwamish-Green
Lakeland North
Federal Way
Lea Hill
Auburn
Lakeland South
Tacoma
University Place
WRIA 10
Puyallup-White
Lakewood
WRIA 12
Chambers-Clover
Puyallup
Prairie Ridge
Parkland
Fort Lewis
South Hill
Spanaway
0 1 2 4 6 8 Miles
0 500 1,000 2,000 Feet
PACIFIC HWY E
E BAY ST
E 26TH ST
Puyallup River
RIVER RD E
Latitude: 47.2408 Longitude: -122.4007
0 750 1,500 3,000 Feet
509
Latitude: 47.2590 Longitude: -122.3574

d. WRIA 12


N
Lakeland North
WRIA 9
Duwamish-Green
Federal Way
Auburn
Lakeland South
Tacoma
University Place
WRIA 10
Puyallup-White
Lakewood
Puyallup
WRIA 12
Chambers-Clover
Parkland
Fort Lewis
South Hill
Spanaway
Elk Plain
0 1 2 4 6 8
Miles
Nisqually River
WRIA 12
Chambers-Clover
Latitude: 47.0992 Longitude: -122.6816
Puget Sound
BROWN LOOP
RIDGE VIEW DR
0 250 500 1,000
Feet

e. WRIA 11

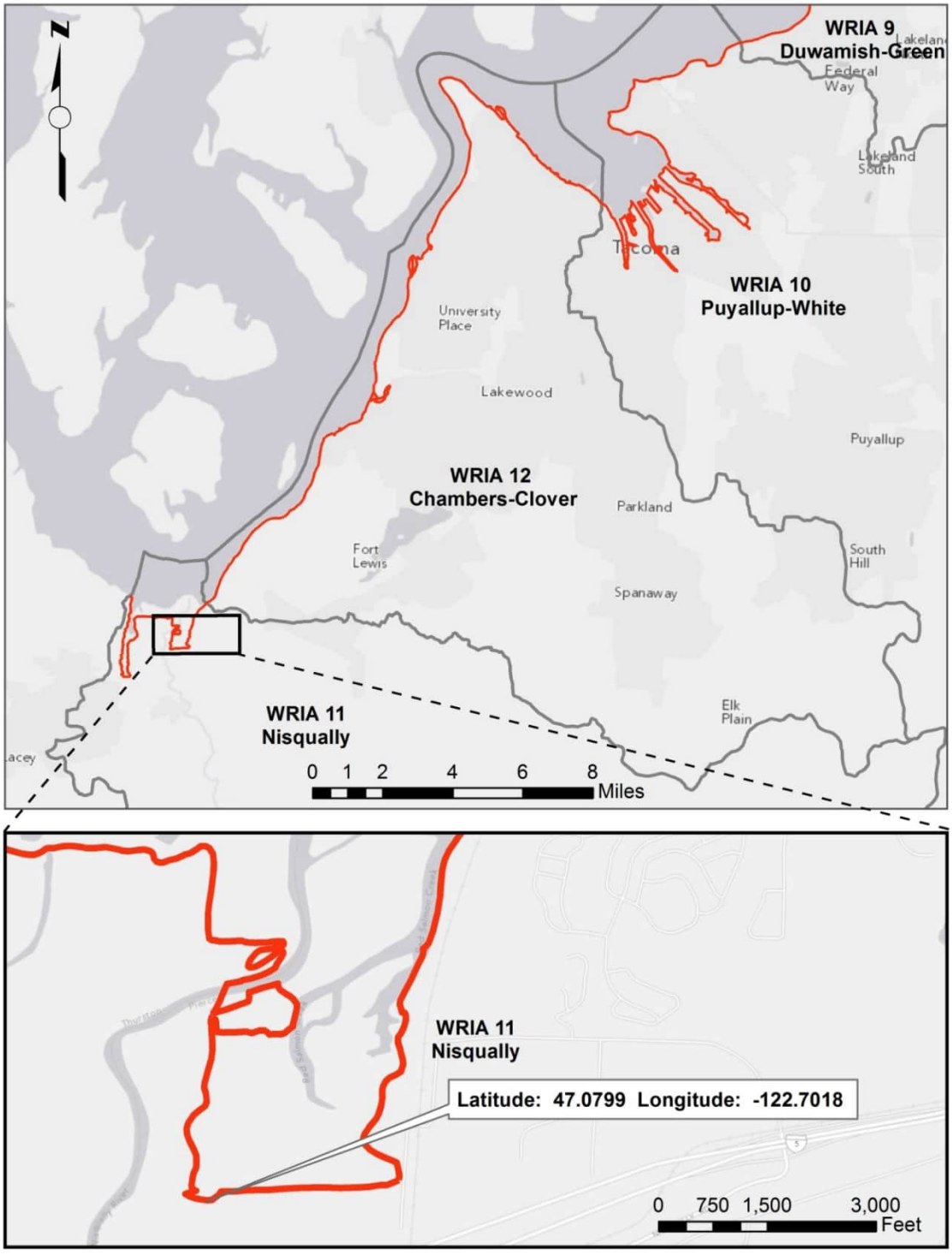
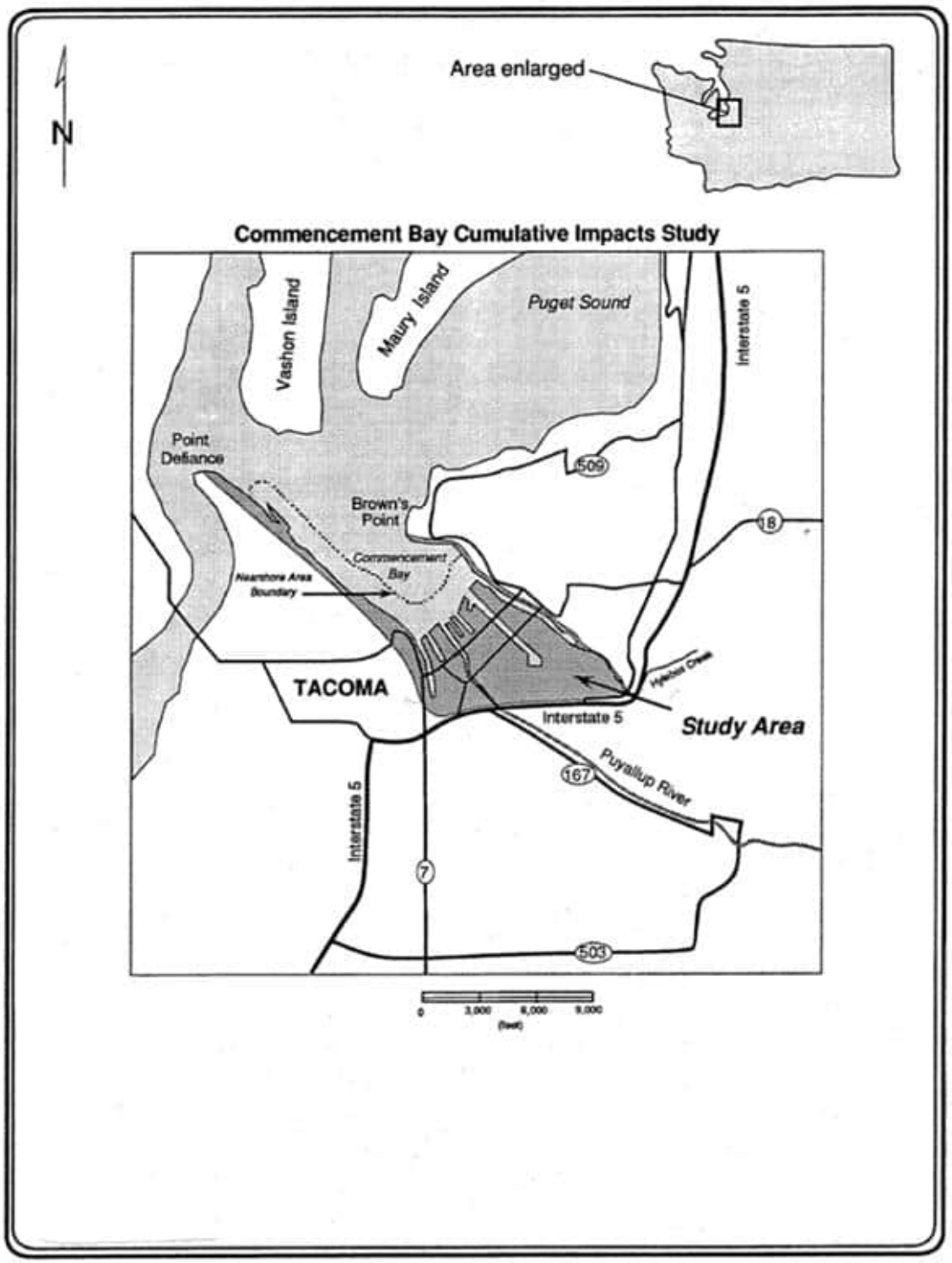

WRIA 9
Duwamish-Green
Federal Way
Lakeland South
Tacoma
WRIA 10
Puyallup-White
University Place
Lakewood
Puyallup
WRIA 12
Chambers-Clover
Parkland
Fort Lewis
South Hill
Spanaway
Elk Plain
WRIA 11
Nisqually
0 1 2 4 6 8
Miles
WRIA 11
Nisqually
Latitude: 47.0799 Longitude: -122.7018
0 750 1,500 3,000
Feet

Figure 2. RGC 4 - Commencement Bay Study Area



US Army Corps of Engineers ®
Seattle District

CERTIFICATE OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

Permit Number: NWS-2021-477

Name of Permittee: Skagit County Public Works.

Date of Issuance: November 30, 2022

Upon completion of the activity authorized by this permit, please check the applicable boxes below, date and sign this certification, and return it to the following address:

Department of the Army
U.S. Army Corps of Engineers
Seattle District, Regulatory Branch
Post Office Box 3755
Seattle, Washington 98124-3755

Please note that your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with the terms and conditions of your authorization, your permit may be subject to suspension, modification, or revocation.

☐	The work authorized by the above-referenced permit has been completed in accordance with the terms and conditions of this permit. Date work complete: _____
	☐ Photographs and as-built drawings of the authorized work (OPTIONAL, unless required as a Special Condition of the permit).

☐	If applicable, the mitigation required (e.g., construction and plantings) in the above-referenced permit has been completed in accordance with the terms and conditions of this permit (not including future monitoring). Date work complete: _____
	☐ Photographs and as-built drawings of the mitigation (OPTIONAL, unless required as a Special Condition of the permit).

Printed Name: _____

Signature: _____

Date: _____

From:	Elizabeth Babcock - NOAA Federal
To:	Perry, Randel J CIV USARMY CENWS (USA)
Cc:	Lisa Abernathy; donald.hubner@noaa.gov; NWS-ESA-Team; Mahen, Kristin L CIV USARMY CENWS (USA); SSNP_WA@fws.gov; SSNP-WA wcr - NOAA Service Account
Subject:	[Non-DoD Source] Verification: SSNP – Skagit County Public Works Cleanup, NMFS#: WCRO-2019-0466-5158, Corps# NWS-2021-477
Date:	Wednesday, November 30, 2022 12:13:02 PM

Mr. Perry,

We reviewed the notification email and project package you submitted WCRO-2019-0466-5158, requesting that NMFS review and confirm the action named above is consistent with the Salish Sea Nearshore Programmatic (SSNP) biological opinion and EFH consultation issued to the Corps on June 29, 2022 (WCRO-2019-0486).

Based on the materials and documentation submitted by the Corps, the proposed project's adverse effects are consistent with those evaluated in the SSNP biological opinion. They include:

- Harassment, capture, death, injury of juvenile fish at in-water work area construction sites
- Harm caused by resuspension of contaminants during sediment remediation

Based on information submitted by the Corps, the proposed action is consistent with the SSNP's design criteria and general construction measures. NMFS has reviewed and verified the following applicable elements:

- Contaminated sediments remediation meets PDC #14

No conservation offsets are required for these activities. Therefore, NMFS confirms this action meets the conditions of the SSNP programmatic biological opinion, WCRO-2019-04086 issued on June 29, 2022. A copy of all review materials is on file at NOAA's Institutional Repository.

Please note that the opinion requires the Corps to follow the Program Administration # 10 (Monitoring and reporting) section of the Opinion. All project notifications and reports are to be submitted electronically to NMFS SSNP mailbox at ssnp-wa.wcr@noaa.gov .

If project changes occur following verification, the applicant must alert the Corps and NMFS and confirm whether re-verification under SSNP is needed. Failure to do so may invalidate ESA take exemption.

If you have questions regarding this confirmation please contact Lisa Abernathy at lisa.abernathy@noaa.gov.

Thank you,

Elizabeth

--
Elizabeth Babcock
Branch Chief, North Puget Sound
NOAA National Marine Fisheries Service
7600 Sandpoint Way NE
Seattle, WA 98040
Office (206) 526-4505
Mobile (206) 276-7029
Fax (206) 526-6426

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600, Olympia, WA 98504-7600 • 360-407-6000

November 25, 2024

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273
Sent by email only: margog@co.skagit.wa.us

RE: Coverage under the Construction Stormwater General Permit

Permit number:	**WAR313996**
Site Name:	**March Point (Whitmarsh) Landfill**
Location:	**9663 Marchs Point Rd**
	Anacortes, WA **County: Skagit**
Disturbed Acres:	**16.8**

Dear Margo Gillaspy:

The Washington State Department of Ecology (Ecology) received your Notice of Intent for coverage under Ecology's Construction Stormwater General Permit (CSWGP). This is your permit coverage letter. Your permit coverage is effective November 25, 2024.

Retain this letter as an official record of permit coverage for your site. You may keep your records in electronic format if you can easily access them from your construction site. You can get the CSWGP, permit forms, and other information at Ecology's CSWGP eCoverage Packet webpage[1]. Contact your Permit Administrator, listed below, if you want a copy of the CSWGP mailed to you. Please read the permit and contact Ecology if you have any questions.

Electronic Discharge Monitoring Reports (WQWebDMR)
This permit requires you to submit monthly discharge monitoring reports (DMRs) for the full duration of permit coverage (from the first full month of coverage to termination). Your first sampling and reporting period will be for the month of **December** and your first DMR must be submitted by **January 15, 2025**.

[1] http://www.ecology.wa.gov/eCoverage-packet

You must submit your DMRs electronically using Ecology's secure online system, WQWebDMR. To sign up for WQWebDMR go to Ecology's WQWebPortal guidance webpage[2]. If you have questions, contact the portal staff at (360) 407-7097 (Olympia area), or (800) 633-6193/Option 3, or email WQWebPortal@ecy.wa.gov.

Appeal Process
You have a right to appeal coverage under the general permit to the Pollution Control Hearing Board (PCHB). Appeals must be filed within 30 days of the date of receipt of this letter. Any appeal is limited to the general permit's applicability or non-applicability to a specific discharger. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2). For more information regarding your right to appeal, please reference Ecology's Focus Sheet: *Appeal of General Permit Coverage*[3].

Annual Permit Fees
RCW 90.48.465 requires Ecology to recover the costs of managing the permit program. Permit fees are invoiced annually until the permit is terminated. Termination conditions are described in the permit. For permit fee related questions, please contact the Water Quality Fee Unit at wqfeeunit@ecy.wa.gov or (800) 633-6193/Option 2. You can also visit Water Quality Permit Fees Webpage[4] for more information.

Ecology Field Inspector Assistance
If you have questions regarding stormwater management at your construction site, please contact your Regional Inspector, Sylvia Graham of Ecology's Bellingham Field Office at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Questions or Additional Information
Ecology is here to help. Please review our Construction Stormwater General Permit webpage[5] for more information. If you have questions about the Construction Stormwater General Permit, please contact your Permit Administrator, Melinda Wilson at melinda.wilson@ecy.wa.gov, or (360) 870-8290.

Sincerely,

Jeff Killelea, Manager
Permit and Technical Services Section
Water Quality Program

[2] https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance
[3] https://apps.ecology.wa.gov/publications/summarypages/1710007.html
[4] https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Fees
[5] www.ecology.wa.gov/constructionstormwaterpermit

Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

for

Remediation at Whitmarsh Landfill

Anacortes, Washington

Version 1

Prepared for:

Washington State Department of Ecology (Ecology) Northwest Region

Permittee/Owner	**Contractor**	**Owner**
Skagit County Solid Waste Division 1800 Continental Place Mt. Vernon, WA 98273 PERMIT No. NOI	TBD	Skagit County 1800 Continental Place Mt. Vernon, WA 98273

Project Location:

9663 S. Marsh Point Road

Anacortes, WA 98221

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

Project Construction Dates

Activity/Phase	Start Date	End Date
Remediation	April 2025	December 2025

Document Revisions Record

Version	Organization	Prepared by	Date
1.0	WSP USA Environment & Infrastructure Inc.	Koorus Tahghighi	August 1, 2024

Contents

Project Information 1
Existing Conditions 1
Proposed Construction Activities 2
Construction Stormwater Best Management Practices (BMPs) 5
The 13 Elements 5
Element 1: Preserve Vegetation/Mark Clearing Limits 5
Element 2: Establish Construction Access 5
Element 3: Control Flow Rates 5
Element 4: Install Sediment Controls 6
Element 5: Stabilize Soils 7
Element 6: Protect Slopes 8
Element 7: Protect Drain Inlets 8
Element 8: Stabilize Channels and Outlets 8
Element 9: Control Pollutants 8
Element 10: Control Dewatering 10
Element 11: Maintain BMPs 10
Element 12: Manage the Project 10
Element 13: Protect Low Impact Development (LID) BMPs 11
Pollution Prevention Team 11
Monitoring and Sampling Requirements 12
Site Inspections 12
Stormwater Quality Sampling 12
Reporting and Record Keeping 12
Record Keeping 12
Site Logbook 12
Records Retention 13
Updating the SWPPP 13
Reporting 13
Discharge Monitoring Reports 13
Notification of Noncompliance 13

List of Figures

See Appendix A

List of Tables

Table 1—Pollutants....8
Table 2—pH-Modifying Sources....9
Table 3—Management BMPs....11
Table 4—BMP Implementation Schedule....11
Table 5—Team Information....12

List of Appendices

A. Project Drawings
B. Analytical Testing Information
C. Stormwater Letter
D. Best Management Practices
E. Site Inspection Form

List of Acronyms and Abbreviations

Acronym/Abbreviation	Explanation
BMP	best management practice
BNSF	BNSF Railway Company
CESCL	Certified Erosion and Sediment Control Lead
CSWGP	Construction Stormwater General Permit
Ecology	Washington State Department of Ecology
ESC	erosion and sediment control
GCL	geosynthetic clay liner
MLLW	mean lower low water
PCBs	polychlorinated biphenyls
SWMMWW	Stormwater Management Manual for Western Management Washington
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load

Project Information

Project/Site Name:	Remedial Action – March Point (Whitmarsh) Landfill				
Street/Location:	9663 South March Point Road				
City:	Anacortes	State:	WA	Zip code:	98221
Subdivision:	None				
Receiving waterbody:	Padilla Bay				

Existing Conditions

Total acreage:

The total limit of work is approximately 16.7 acres.

Disturbed acreage:

The total area of disturbed acreage is approximately 16.8 acres.

Existing structures:

There are no structures on site.

Landscape topography:

The project area is generally flat, with a general slope from west to east, toward Padilla Bay. The maximum localized slopes are approximately 3 percent on the landfill, and approximately 30 to 50 percent at the south and east edges. One swale traverses the north boundary, and another swale traverses the west and south boundaries, sloping east toward Padilla Bay.

Existing drainage patterns:

The project drawings are included as **Appendix A** and are referenced in this document. Currently, the property is a landfill with clean cover soil on the surface (Drawings G-1 and G-3). The stormwater primarily infiltrates. Any stormwater runoff will flow either directly east into Padilla Bay, north to the swale along the existing railroad tracks and then east to Padilla Bay, or south to the swale separating the landfill from South March Point Road and then east into Padilla Bay (Drawing C-2).

Existing vegetation:

The site has been mowed, but the site generally contains native trees and shrubs (e.g., red alder, Sitka willow, salmonberry) and invasive species (e.g., Himalayan blackberry, reed canary grass) (ICF, 2016).

Critical areas (wetlands, streams, high erosion risk, steep or difficult to stabile slopes):

There are no wetlands on top of the landfill, but there is a continuous wetland in the south swale and extending into Padilla Bay mudflats.

List of known impairments for Section 303(d) 303(d) of the Clean Water Act listed or Total Maximum Daily Load (TMDL) for the receiving waterbody:

There is no TMDL for Padilla Bay. The outer lagoon is listed as Category 5 for sediment polychlorinated biphenyls (PCBs) and Category 2 for pH and dissolved oxygen in water.

List all known or suspected contaminants associated with the site in Table 1, including contaminants previously remediated:

There is no known surface contamination. Subsurface soil and groundwater investigations conducted on the property indicate the presence of metals, total petroleum hydrocarbons, PCBs, benzene, semivolatile organic compounds, and pesticides in exceedance of the cleanup levels. For the project purposes, the site groundwater and the entire subsurface soil below the clean cover soil are assumed to be contaminated. Previous sample locations, summary tables of the analytical data, concentrations, and analytical test reports are presented in **Appendix B**.

Proposed Construction Activities

Description of site development:

The project includes excavating waste from BNSF right-of-way and regrading the entire site by excavating the perimeter of the landfill to develop a 33 percent slope along the southwest and south swale boundaries, a slope of 20 percent to the east along Padilla Bay, and a slope of 25 percent to the north along the BNSF Railway Company (BNSF) right-of-way. All material within the BNSF right-of-way will be excavated and placed on the landfill, thus creating new mudflats that will separate the landfill from the railroad embankment. This excavation will be performed as much as possible before opening the area to Padilla Bay at the northeast of the landfill. Excavation to the west will include removal of all waste outside the current entrance to the site and placing the waste on the landfill, and backfilling the area to the existing grades. All excavated material will be placed on top of the landfill and sloped to between 5 and 10 percent slopes, as shown on Drawing C-7, to promote stormwater runoff. No off-site shipment of the landfill waste is planned. Drawing C-5 shows the final top of waste contours and Drawing C-8 shows the final site plan.

Groundwater will be extracted where needed to allow the work to continue and to minimize or prevent discharge into Padilla Bay during earthwork along the waterway. Where excavating along the shoreline, the groundwater is planned to be intercepted upgradient of the work area from trenches or pits/sumps, as needed, (Drawing C-2) to achieve interception. Other control or removal measures, such as, absorbent booms will be deployed if needed to eliminate or reduce negative impact to Padilla Bay. A groundwater treatment system will be set up on site to treat the water in order to achieve suspended solid (sediment) and pollutant levels for discharge into the City of Anacortes sanitary sewer (Drawing C-4).

The entire site will be covered with an engineered cap system. All site soil will be placed beneath the low permeability layer and all earthen material above the low permeability layer will be imported from approved commercial sources. The cap layering will consist from bottom to top: 1) a 6- to 8-inch-thick

salvaged site sand layer over the regraded waste, with landfill gas collection and venting piping' 2) a geosynthetic clay liner with lamination (GCLL), 3) a 6-inch-thick sand layer, 4) a layer of filter fabric, 5) a 12-inch-thick crushed rock layer, 6) a layer of filter fabric, 7) a 12-inch-thick layer of cover soil, and 8) a 6-inch-thick layer of topsoil on top of the landfill. Where the shoreline slopes are below the high tide line (HTL) of elevation 10.27 feet, mean lower low water (MLLW), sand will be placed instead of topsoil. The final grading plan is presented on Drawing C-7 and a detail showing the cross section of the proposed landfill cap is presented on Drawings C-13 and C-14.

The slopes at the southeast, east, and north sides will be planted with select plants and bushes appropriate for the area up to elevation 16.5 feet MLLW. The area will become a riparian habitat. The surface finish below the high tide line will be sand, allowing for natural development of new marsh grass coverage (Drawing R-1).

The completed site will be hydroseeded with native seed mix and appropriate tackifier and fertilizer, and an access road composed of crushed rock will be constructed to provide access around the landfill and a perimeter security fence will be installed to prevent public access. Several rows of compost berms will be installed on the final grade to slow down the stormwater flow and filter out any suspended solids, until the grass has grown and the surface has stabilized. The area to the west and northwest, as well as narrow strip along the south swale will be covered with non-erodible crushed rock surfacing material instead of topsoil (Drawings C-8 and R-1).

Description of construction activities:

Construction activities include:

- Site preparation: installing temporary erosion control measures and constructing a crushed rock construction entrance. Work areas will be marked, silt fences will be installed around the entrance and straw wattles will be installed across south swale, and a turbidity curtain will be installed in the bay along the project boundary (Drawing C-2).
- Excavation of waste from the perimeter of the landfill and placement in the middle area of the landfill (Drawing C-5).
- Groundwater extraction, treatment, and discharge into sanitary sewer (Drawing C-4).
- Covering the waste with salvaged site sand and installing a passive landfill gas venting system. and covering the landfill with an approximately 3-foot-thick low permeability engineered cap (Drawing C-7 and C-11).
- Constructing an engineered, low permeability landfill cap system with GCLL low permeability layer and imported earthen material (Drawing C-7, C-13, and C-14).
- Installing a site access road, planting vegetation on the slopes, hydroseeding the site, installing rows of compost berms for filtration of stormwater runoff, and installing perimeter security fencing (Drawings C-8 and R-6.

Description of site drainage, including flow from and onto adjacent properties (must be consistent with Site Map in Appendix A):

Currently, most of the stormwater infiltrates on site and is expected to do so during construction. Stormwater runoff from the entire site, if any, flows either directly east into Padilla Bay, north to a swale along existing railroad tracks then east into Padilla Bay, or south into a stormwater swale separating the site from South March Point Road that ultimately drains into Padilla Bay. The total drainage basin is approximately 16.8 acres. There is no stormwater flow to any neighboring property, except within the BNSF right-of-way (Drawing C-2). The drainage patterns will remain the same after completion of the project.

After project completion, the stormwater will continue to flow north, east, and south, and all of it will discharge into Padilla Bay. The final site grades are shown on Drawing C-8. A letter was submitted to the City of Anacortes in Lieu of a complete Stormwater Site Plan, which the City accepted. The text of the letter, without the attachments, is included in **Appendix C** for reference.

Description of final stabilization:

The area to the northwest and parts of the area to the south will be covered with crushed rock surfacing material. An access road will be constructed around the landfill using crushed rock. The rest of the disturbed areas will be hydroseeded with native grass seeds. The slopes along Padilla Bay will be vegetated with bushes from above the high tide line (elevation 10.27 feet above MLLW) to a distance of approximately 30 feet (up to elevation 16.5 feet above MLLW). Five rows of compost berms will be installed on the landfill to reduce the stormwater runoff flow velocity and filter suspended solids before the stormwater runoff discharges into Padilla Bay. The compost berms will be removed once all the vegetation has been established and the surface becomes non-erodible (Drawings C-8 and R-6).

Contaminated site information:

Contamination in subsurface soil and groundwater is present on site. The sample locations, sample depths, and analytical testing summary tables and available laboratory reports are included in **Appendix B**. All of the final surface covering material will be clean earthen material, imported from commercial sources.

Construction Stormwater Best Management Practices (BMPs)

The SWPPP is a living document reflecting current conditions and changes throughout the life of the project. These changes may be informal (i.e., hand-written notes and deletions). Update the SWPPP when the CESCL has noted a deficiency in BMPs or deviation from original design.

The 13 Elements

BMPs will be implemented prior to the initiation of the project. BMPs are included in **Appendix D** as a quick reference tool for the on-site inspector in the event the BMPs listed for the elements below are deemed ineffective or inappropriate during construction to satisfy the requirements set forth in the National Pollutant Discharge Elimination System CSWGP. All stormwater management shall comply with all the applicable requirements of the CSWGP.

To avoid potential erosion and sediment control (ESC) issues that may cause a violation(s) of the CSWGP, the CESCL will promptly initiate the implementation of one or more alternative BMPs listed in **Appendix D** after the first initial sign that existing BMPs are ineffective or failing.

Element 1: Preserve Vegetation/Mark Clearing Limits

To protect adjacent areas and to maintain the smallest footprint during construction, the project limits will be clearly marked at the initiation of the project and temporary fencing will be installed along the limit of work. The site will be mowed, but any trees deemed outside the limit of work will remain. Filter fabric fencing will be installed within the south swale. The BMPs that will be used include:

- Preserving Natural Vegetation (BMP C101 from Ecology's *Stormwater Management Manual for Western Washington* [SWMMWW])
- Silt Fence (BMP C233 from the SWMMWW)

Element 2: Establish Construction Access

The construction entrance will be near the gate at South March Point Road, and it will be stabilized with crushed rock (e.g., quarry spalls) to minimize the risk of tracking onto public roads (Drawing C-2). Site roads have been stabilized; however, additional rock may be placed if needed to facilitate project traffic and staging areas.

The specific BMP related to establishing construction access that could be used on this project is:

- Stabilized Construction Entrance (BMP C105 from the SWMMWW)

Element 3: Control Flow Rates

Will you construct stormwater retention and/or detention facilities?

☐ Yes ☒ No

Will you use permanent infiltration ponds or other low-impact development (example: rain gardens, bio-retention, porous pavement) to control flow during construction?

☐ Yes ☒ No

A sanitary sewer discharge permit will be obtained from the City of Anacortes wastewater treatment facility. A water treatment system will be installed and operated to treat extracted groundwater and any stormwater that may need to be removed from the work area. The treated water will be tested to verify it meets the allowable discharge limits and discharged into the sanitary sewer.

The specific BMPs related to controlling flow rates that may be used on this project may include:

- Outlet Protection (BMP C209 from the SWMMWW)
- Straw Wattles (BMP C235 from the SWMMWW)
- Water Bars (BMP C203 from the SWMMWW)

Element 4: Install Sediment Controls

Any stormwater accumulation on contaminated surfaces during the work will be infiltrated on site, or processed through the water treatment system . There are no catch basins on site or on the street within the immediate area of the landfill entrance. A turbidity curtain (floating silt fence) will be installed and maintained along Padilla Bay. The utility pipes will be capped to prevent any discharges via subsurface pipes.

Specific BMPs that may be used for controlling sediment on this project include:

- Straw Wattles (BMP C235 from the SWMMWW), if needed
- Silt Fence (BMP C233 from the SWMMWW)

Alternative BMPs that could be used for controlling sediment on this project include:

- Gravel Filter Berm (BMP C232 from the SWMMWW)
- Vegetated Strip (BMP C234 from the SWMMWW)
- Sediment Trap (BMP C240 from the SWMMWW)
- Construction Stormwater Filtration (BMP C251 from the SWMMWW)
- Portable Water Storage Tanks (e.g., Baker Tank)
- Materials on Hand (BMP C150 from the SWMMWW) also may be applicable

Sediment control BMPs will be constructed as shown on the drawings (**Appendix A**). BMPs will be installed prior to the start of activities. Damaged sediment control structures will be repaired when they are observed. Sediment will be removed from the silt fence and storm drain inlet if sediment reaches 30 percent of the height of the BMP. Removed sediment will be incorporated into the landfill.

Element 5: Stabilize Soils

West of the Cascade Mountains Crest

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1–October 30	7 days
During the Wet Season	November 1–April 30	2 days

While not expected, soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast. Contaminated soil stockpiles will be covered daily.

Anticipated project dates: **Start date:** Mobilization April 2025; excavation beginning of May 2025

End date: Construction 31 October 2025; demobilization November 2025

Will you construct during the wet season?

☐ Yes ☒ No – No earth-disturbing activities are planned.

The grading along Padilla Bay will be conducted during low tides. Each day, only a segment of the slope will be disturbed that can be covered with a layer of clean material or plastic sheeting the same day, before the tide comes in. The specific BMP for soil stabilization that will or could be used on this project is:

- Topsoiling (BMP C125 from the SWMMWW)
- Temporary and Permanent Seeding (BMP C120 from the SWMMWW)

Alternative BMPs for soil stabilization that could be used on this project include:

- Sodding (BMP C124 from the SWMMWW)
- Materials on Hand (BMP C150 from the SWMMWW)
- Nets and Blankets (BMP C122 from the SWMMWW)
- Plastic Covering (BMP C123 from the SWMMWW)
- Dust Control (BMP C140 from the SWMMWW)
- Mulching (BMP C121 from the SWMMWW)

Soil stabilization BMPs, in addition to re-vegetation, will be installed if needed. Straw wattles or plastic covering will be used, as necessary, to protect the slopes. In general, stockpiled soils will be stabilized from erosion, protected with sediment trapping measures and, where possible, be located away from drainage channels.

Temporary mulching (e.g., straw) or plastic covering may be used, if needed, to stabilize exposed soils and protect against erosion, as necessary. All soil stabilization BMPs will be installed as soon as practicable after soil disturbance.

Element 6: Protect Slopes

Will steep slopes be present at the site during construction?

☒ Yes ☐ No – Slopes will be 20 (5H:1V) or 25 (4H:1V) percent along the perimeter, except the southwest area of the south swale where it will be sloped to 33 percent (3H:1V) or less. The top of the landfill slopes will be 10 percent or less. The waste will be covered with a clean layer of material or plastic sheeting the same day it is exposed. Protection measures such straw wattle may be used, if needed (BMP C235 from the SWMMWW).

Element 7: Protect Drain Inlets

All on-site storm drain inlets and culverts within the work areas will be capped. Stormwater collection and conveyance in the area is via roadside ditches; no catch basins are present in the area. The surface ditches in the area ultimately discharge into the south swale, where the project will install rows of straw wattles perpendicular to the flow for filtration.

BMPs will be inspected and maintained frequently, especially after storm events. Catch basin filters will be cleaned or replaced if sediment has filled the device by one third, or as specified by the manufacturer. Sediment, debris, trash, and all other material collected will be incorporated into the landfill.

Element 8: Stabilize Channels and Outlets

The construction will not affect channels and outlets and no BMPs are required for stabilization of stream banks or slopes or at outlets.

Element 9: Control Pollutants

Table 1 provides the anticipated pollutants likely in the project area during construction.

Table 1—Pollutants

Pollutant	Source
Petroleum and other chemical products	Equipment Vehicles Refueling

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on site?

☒ Yes ☐ No – Only in designated area.

Will wheel wash or tire bath system BMPs be used during construction?

☐ Yes ☒ No – Wheel wash will be utilized if needed. The primary method of preventing sediment tracking will be construction entrance rock.

Will pH-modifying sources be present on site?

☐ Yes ☒ No Existing broken concrete slabs will be incorporated into the landfill and capped.

Table 2—pH-Modifying Sources

☒	None
☐	Bulk cement
☐	Cement kiln dust
☐	Fly ash
☐	Other cementitious materials
☐	New concrete washing or curing waters
☐	Waste streams generated from concrete grinding and sawing
☐	Exposed aggregate processes
☐	Dewatering concrete vaults
☐	Concrete pumping and mixer washout waters
☐	Recycled concrete
☐	Recycled concrete stockpiles
☐	Other (i.e., calcium lignosulfate) [please describe:]

Will uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations be infiltrated, provided the wastewater is managed in a way that prohibits discharge to surface waters?

☐ Yes ☐ No - Not applicable

Vehicles, Construction Equipment, and/or Petroleum Product Storage/Dispensing:

All vehicles, equipment, and petroleum product storage/dispensing areas will be inspected regularly to detect any leaks or spills and to identify maintenance needs to prevent leaks or spills. Spill prevention measures, such as drip pans and absorbent pads, will be used when conducting maintenance and repair of vehicles or equipment.

To perform emergency repairs on site, temporary plastic will be placed beneath and, if raining, over the vehicle. A sufficient quantity of stocked spill response kits will be available on site, including smaller portable spill kits carried within equipment and construction vehicles.

In addition, the following steps are required:

- Contain and clean up spills immediately
- Clean spills and contaminated surfaces immediately following any discharge or spill incident, using dry cleanup measures
- Eliminate the source of the spill to prevent a discharge

Good housekeeping and preventative measures will be taken to ensure that the site will be kept clean and well-organized.

The following measures are required to provide BMPs for waste management:

- **Sanitary wastewater:** Portable sanitation facilities will be firmly secured, regularly maintained, and emptied when necessary.

- **Solid waste:** Solid waste will be incorporated into the landfill and covered with an engineered low permeability cap.
- **Wheel wash wastewater:** The use of a Wheel Wash (BMP C106 from the SWMMWW) on site is not anticipated, but if installed, wastewater will be processed through the on-site treatment system and discharged into the sanitary sewer.
- **Spill Prevention Control and Countermeasures Plan:** A separate Spill Prevention, Control, and Countermeasures Plan will be developed by the contractor.

Element 10: Control Dewatering

Dewatering will be implemented on the upland along the perimeter facing waterways to reduce or prevent groundwater discharge into the waterways.

Element 11: Maintain BMPs

All temporary and permanent ESC BMPs shall be maintained and repaired as needed to ensure continued performance of their intended function.

Maintenance and repair will be conducted in accordance with each particular BMP specification (see Volume II of the SWMMWW).

Visual monitoring of all BMPs installed at the site will be conducted by the contractor at least once every calendar week and within 24 hours of any stormwater or non-stormwater discharge from the site. If the site becomes inactive and is temporarily stabilized, the inspection frequency may be reduced to once every calendar month.

All temporary ESC BMPs may be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Trapped sediment shall be stabilized on site or removed. Disturbed soil resulting from removal of either BMPs or vegetation shall be permanently stabilized.

Vegetation will be used to permanently stabilize the work areas. The vegetation growth and health will be monitored to ensure long-term stabilization. Compost berms will be constructed around the landfill, perpendicular to the surface flow to filter any suspended solids and slow down the flow velocity.

Element 12: Manage the Project

The project will be managed based on the following principles:

- Project is designed to be completed during the dry season
- Inspection and monitoring:
    - Inspection, maintenance, and repair of all BMPs will occur as needed to ensure performance of their intended function
    - Site inspections and monitoring are required in accordance with Special Condition S4 of the CSWGP
- The SWPPP will be updated, maintained, and implemented in accordance with Special Conditions S3, S4, and S9 of the CSWGP

As site work progresses, the SWPPP will be modified if needed to reflect changing site conditions. The SWPPP will be reviewed to ensure the content is current.

Management BMPs that apply to the site are shown in **Table 3.**

The BMP implementation schedule is provided in **Table 4**.

Table 3—Management BMPs

The following Management BMPs will be employed:

☒	Design the project to fit the existing topography, soils, and drainage patterns
☒	Emphasize erosion control rather than sediment control
☒	Minimize the extent and duration of the area exposed
☒	Keep runoff velocities low
☒	Retain sediment on-site
☒	Thoroughly monitor site and maintain all ESC measures
☒	Schedule major earthwork during the dry season
	Other (please describe): Leave paved surfaces intact

Table 4—BMP Implementation Schedule

Phase of Construction Project	Stormwater BMPs	Date	Wet/Dry Season
Prior to construction	Clearing Limit BMPs	Estimated April/May 2024	Wet
	Stabilized Construction Entrance		
	Delineate Construction Staging and Parking Areas		
	Control Flow Rate BMPs		
	Sediment Controls BMPs		
	Protect Storm Drain Inlets		
	Manage Materials		
During/After construction or as needed	Stabilize Soils BMPs	Estimated October/November 2024	Wet
	Protect Slopes BMPs		
	Manage Construction Materials		
	Repair/modification/replacement of BMPs as needed		
	Install additional BMPs as needed		

Element 13: Protect Low Impact Development BMPs

Not applicable.

Pollution Prevention Team

The pollution prevention team listed in **Table 5** is responsible for implementation of the SWPPP.

Table 5—Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD	TBD
Project Manager	Koorus Tahghighi	206-641-6301
Monitoring Personnel		
Emergency Permittee/Owner Contact	Margo Gillaspy	360-770-4213
Non-Emergency Permittee/Owner Contacts	Margo Gillaspy	360-416-1578
Ecology Regional Office	Sylvia Graham	360-927-4900
Emergency Ecology Contact		

Monitoring and Sampling Requirements

Monitoring includes visual inspection, sampling for water quality parameters of concern where needed, and documentation of the inspection and sampling findings in a site logbook. A site logbook will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- A record of site inspections
- Stormwater sampling data, where needed

A Construction Stormwater Site Inspection Form can be found in **Appendix E**.

The site logbook must be maintained on site and be made available upon request to Ecology or the local jurisdiction.

Site Inspections

Site inspections will be conducted daily during construction. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

Stormwater Quality Sampling

There are no requirements for stormwater sampling as all stormwater from work areas will be infiltrated.

Reporting and Record Keeping

Record Keeping

Site Logbook

A site logbook will be maintained for all on-site construction activities and will include:

- A record of the implementation of the SWPPP and other permit requirements
- Site inspections

Records Retention

Records will be retained during the life of the project and for a minimum of three years following the termination of permit coverage in accordance with Special Condition S5.C of the CSWGP.

Permit documentation to be retained on-site includes the following:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site logbook

Permit documentation will be provided within 14 days of receipt of a written request from Ecology. A copy of the SWPPP or access to the SWPPP will be provided to the public when requested in writing, in accordance with Special Condition S5.G.2.b of the CSWGP.

Updating the SWPPP

This SWPPP will be modified if:

- It is found to be ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site
- There is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the State

The SWPPP will be modified within seven days if inspection(s) or investigation(s) determine additional or modified BMPs are necessary for compliance. An updated timeline for BMP implementation will be prepared.

Reporting

Discharge Monitoring Reports

Discharge Monitoring Reports will be submitted to Ecology, per the requirements of the CSWGP permit.

Notification of Noncompliance

If any of the terms and conditions of the CSWGP permit are not met, and the resulting noncompliance may cause a threat to human health or the environment, and the following actions will be taken:

1. Ecology will be notified within 24 hours of the failure to comply by calling the Northwest Regional Office's Environmental Report Tracking System at 206-594-0000.
2. Immediate action will be taken to prevent the discharge/pollution or otherwise stop or correct the noncompliance. If applicable, sampling and analysis of any noncompliance will be repeated immediately, and the results submitted to Ecology within five days of becoming aware of the violation.

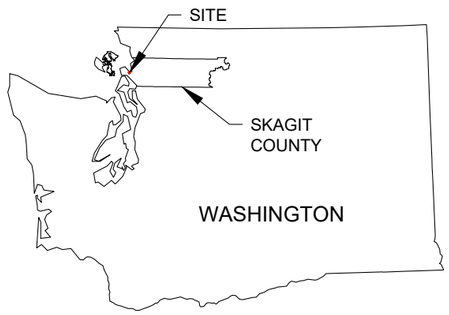
3. A detailed written report describing the noncompliance will be submitted to Ecology's Northwest Regional Office at nwroerts@ecy.wa.gov., and will include the following information:
    a. Your name and phone number
    b. Permit number
    c. City/County of project
    d. Sample results
    e. Date/time of call
    f. Date/time of sample
    g. Project name

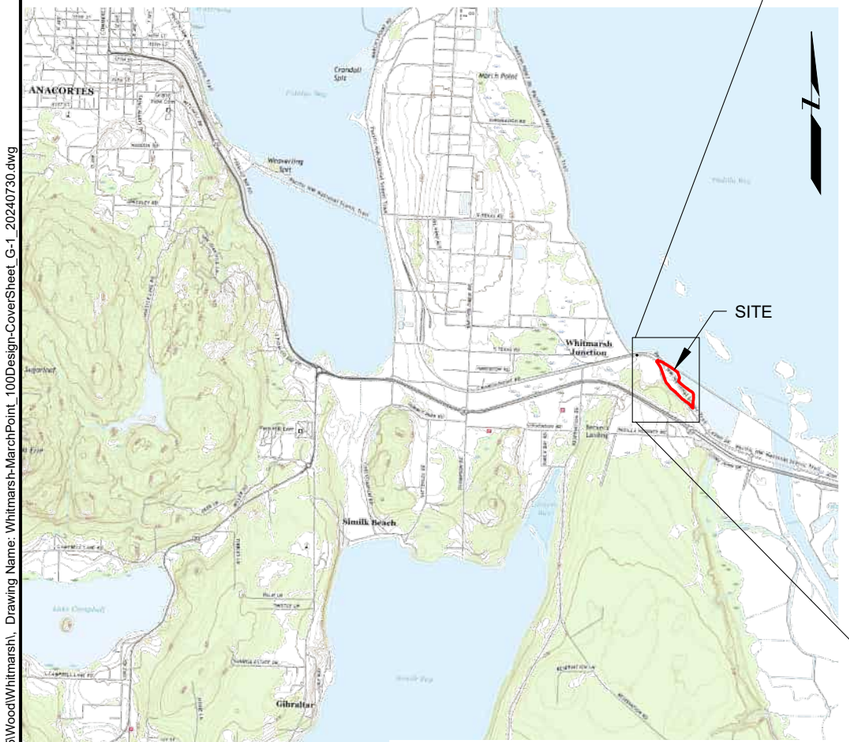
Appendix A

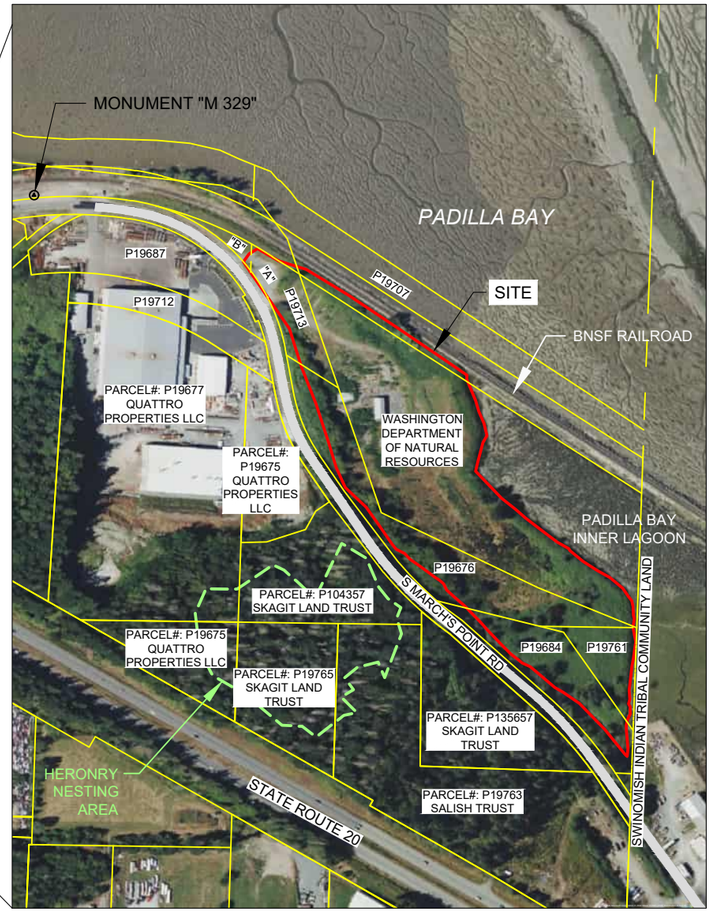
Project Drawings

REMEDIAL ACTION

MARCH POINT (WHITMARSH) LANDFILL
ANACORTES, SKAGIT COUNTY, WASHINGTON







0 0.5 1
1 inch = 1 mile

0 250 500
APPROXIMATE SCALE IN FEET

PROPERTY DESCRIPTION:

PARCEL #19676
That Portion of the following described property lying Easterly of the Old Anacortes-Mount Vernon Highway, The land in the County of Skagit, State of Washington, described as follows: That portion of Government Lot 1 of Section 3, Township 34 North, Range 2 East, W.M., lying Southerly of a line which is equidistant 300 feet Southerly of and parallel to or concentric with the centerline of the right of way of the Great Northern Railway Company (formerly Seattle & Northern Railway Co.), as said centerline of said railroad existed on June 4, 1902, EXCEPT roads, EXCEPT that portion of said property conveyed to Skagit County by Deed dated August 21, 1922 and recorded October 5, 1923, under Auditor's File No. 168344 and recorded in Volume 126 of Deeds, page 633, EXCEPT that portion of said premises conveyed to the State of Washington by Deed dated August 8, 1939 and recorded in Volume 175 of Deeds, page 301, EXCEPT that portion condemned by the State of Washington by Decree entered on May 22, 1961 in the Superior Court for Skagit County under Cause No. 26054, AND EXCEPT that portion lying within the following described premises: Beginning at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the E. Kasch Road; thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the point of beginning.

Records of Skagit County. Washington;
Parcel #19684
The land in the County of Skagit, State of Washington, described as follows: That portion of Government Lot 1 and of the Northeast 1/4 of the Southeast 1/4 of Section 3, Township 34 North, Range 2 East, W.M., described as follows: BEGINNING at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the East Kasch Road: thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the Point Of Beginning: EXCEPT that portion thereof lying Southwesterly of the Southeasterly right-of-way margin of South March Point Read as the same is shown on that certain Deed of Trust recorded under Skagit County Auditor's File No. 9204090078, AND EXCEPT that portion conveyed to Skagit County for road purposes by deed recorded October 5, 1923, under Auditor's File No. 168350 and recorded in Volume 126 of Deeds, page 639, records of Skagit County, Washington, ALSO EXCEPT that portion, if any, conveyed to Skagit County for road purposes by deed recorded October 5. 1923 under Auditor's File No. 168344, in Volume 126 of Deeds, page 633. Records of Skagit County. Washington; ALSO EXCEPT that portion thereof, if any, lying with the right-of-way of the existing as-built County road known as the Anacortes-Mt. Vernon Highway. Situate in the City of Anacortes, County of Skagit, State of Washington.

Parcel #19713
The land in the County of Skagit, State of Washington, described as follows:
PARCEL "A":
That portion of the following described property lying Easterly of the old Anacortes-Mount Vernon Highway;
That portion of Government Lot 1 in Section 3, Township 34 North, Range 2 East, W.M., lying Southerly of a line which is equidistant 300 feet Southerly of and parallel to or concentric with the centerline of the right of way of the Great Northern Railway Company (formerly Seattle & Northern Railway Co.), as said centerline of said railroad existed on June 4, 1902,
EXCEPT roads, EXCEPT that portion of said property conveyed to Skagit County by Deed dated August 21, 1922 and recorded October 5, 1923, under Auditor's File No. 168344 and recorded in Volume 126 of Deeds, page 633, EXCEPT that portion of said premises conveyed to the State of Washington by Deed dated August 8, 1939 and recorded in Volume 175 of Deeds, page 301, EXCEPT that portion condemned by the State of Washington by Decree entered on May 22,1961 in the Superior Court for Skagit County under Cause No. 26054, AND EXCEPT that portion lying within the following described premises: Beginning at a point on the East line of said Section, which is 2,158.2 feet North of the Southeast corner of said Section; thence North 143.4 feet to the Westerly line of the E. Kasch Road; thence North 35°22' West along the Westerly line of said road, 396.7 feet; thence North 76°07' West 482 feet; thence South 582.6 feet; thence East 697.6 feet to the point of beginning. Situate in the County of Skagit, State of Washington.
PARCEL "B":
That portion of the following described tract of land lying and being Northerly of the State Highway, as conveyed by Deeds recorded in Volume 38 of Deeds, page 54, Volume 133 of Deeds, page 386, and in Volume 175 of Deeds, page 302, records of Skagit County, Washington: A strip or piece of land 250 feet wide in Government Lots 1 and 2 of Section 3, Township 34 North, Range 2 East, W.M., being all that part of said Lots 1 and 2, lying between 2 lines parallel to and distant, respectively, 50 feet and 300 feet Southerly, measured at right angles from the centerline of the main track of the former Seattle and Northern Railway Company as conveyed by Deed recorded January 10, 1890, in Volume 9 of Deeds, page 307, records of Skagit County, Washington, as said tract was located and constructed on June 4, 1902, EXCEPTING THEREFROM all that part thereof lying Southwest of the following described line: Beginning at a point in said Lot 2, 300 feet distant Southeasterly from the said centerline of main tract, as measured at right angles to said centerline from a point therein, 555.4 feet distant Northeasterly, measured along said centerline, from the West line of said Lot 2; thence Northwesterly at right angles to said centerline, 165 feet to a point 135 feet distant Southeasterly from said centerline; thence Northwesterly in a straight line to a point 50 feet distant Southeasterly from said centerline, as measured at right angles thereto, from a point therein, 430.4 feet distant Northeasterly measured along said centerline form the West line of said Lot 2. EXCEPT from said strip of land the 30 foot wide right of way of the Puget Sound and Baker River Railway Company right of way, as disclosed by Deed recorded December 18, 1933, under Auditor's File No. 259220, in Volume 163 of Deeds, page 441, records of Skagit County, Washington. Situate in the County of Skagit, State of Washington.

Parcel #19761
The land in the County of Skagit, State of Washington, described as follows:
The Northeast ¼ of the Southeast ¼, lying North and East of 'Kasch Road', Section 3, Township 34 North,Range 2 East, W.M.; EXCEPT that portion, if any, lying within said Northeast ¼ of the Southeast ¼, Section 3, Township 34 North, Range 2 East, W.M., as conveyed to M. Ellen Moon, as Trustee of 'The Charles E. Moon Credit Trust', by Deed recorded February 26, 2003 under Skagit County Auditor's File No. 200302260113; AND EXCEPT Roads. Situate within the City of Anacortes, County of Skagit, State of Washington.

HORIZONTAL DATUM

REFERENCE FRAME: NORTH AMERICAN DATUM (NAD)83
COORDINATE SYSTEM: US STATE PLANE COORDINATE SYSTEM WASHINGTON NORTH ZONE
FOOT DEFINITION: US SURVEY FOOT

VERTICAL DATUM

ELEVATION DATUM: MEAN LOWER LOW WATER (MLLW) IN FEET
BENCHMARK: NGS MONUMENT "M 329"
CONVERSIONS: NAVD88 = 16.02'
NGVD29 = 12.24'
MLLW = 16.55'

100% DESIGN

Know what's below. Call before you dig.

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

WSP USA
Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

KOORUS TAHGHIGHI STATE OF WASHINGTON 35240 REGISTERED PROFESSIONAL ENGINEER

COVER SHEET

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING G-1

Plot Date: 07/30/24 - 11:24am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design-CoverSheet_G-1_20240730.dwg

DRAWINGS LIST:

G-1	COVER SHEET
G-2	GENERAL NOTES
G-3	EXISTING SITE PLAN
G-4	EXISTING UTILITIES
C-1	SITE SETUP
C-2	TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN
C-3	TEMPORARY EROSION AND SEDIMENTATION CONTROL DETAILS
C-4	WATER TREATMENT SYSTEM
C-5	TOP OF WASTE GRADES
C-6	GATE ENTRANCE EXCAVATION
C-7	FINAL GRADING PLAN
C-8	FINAL SITE PLAN
C-9	CROSS SECTION A
C-10	CROSS SECTION B and X
C-11	CROSS SECTIONS C and D
C-12	CROSS SECTIONS E and F
C-13	DETAILS
C-14	DETAILS
R-1	SITE PLANTING PLAN
R-2	PLANTING PLAN ALONG PADILLA BAY INNER LAGOON
R-3	PLANTING PLAN ALONG SOUTHERN DITCH
R-4	SAMPLE PLANTING PLAN
R-5	PLANTING DETAILS AND NATIVE PLANT SCHEDULE
R-6	TEMPORARY IRRIGATION CONCEPT PLAN
R-7	TEMPORARY IRRIGATION CONCEPT AREAS

ABBREVIATIONS:

MLLW	MEAN LOWER LOW WATER
HTL	HIGH TIDE LINE
EL	ELEVATION
GCLL	GEOSYNTHETIC CLAY LINER WITH LAMINATION
MW	MONITORING WELL
MWD	DEEP MONITORING WELL
PZ	PIEZOMETER
LFGP	LANDFILL GAS PROBE
SSMH	STORM SEWER MANHOLE
SSCO	STORM SEWER CLEAN OUT
IE	INVERT ELEVATION
DIA	DIAMETER
OC	ON CENTER
LF	LINEAR FEET
SF	SQUARE FEET
GPM	GALLONS PER MINUTE
PSI	POUNDS PER SQUARE INCH

GENERAL NOTES:

1. ON THIS PROJECT, CONTRACTING AGENCY REFERS TO SKAGIT COUNTY, ENGINEER REFERS TO WSP, AND CONTRACTOR REFERS TO THE REMEDIATION CONTRACTOR.
2. SITE SURVEY CONDUCTED BY NORTHWEST DATUM & DESIGN, INC. AUGUST 31, 2015, AMENDED NOVEMBER 18, 2021.
3. THE INITIAL SURVEYING TO STAKE THE PARCEL LINES WILL BE CONDUCTED BY THE ENGINEER. CONTRACTOR IS RESPONSIBLE FOR ALL INTERIM SURVEYS AND FINAL RECORD SURVEY. CONTRACTING AGENCY MAY ELECT TO CONDUCT CERTAIN IN-PROGRESS SURVEYS TO CALCULATE PAYMENT VOLUMES.
4. CONTRACTING AGENCY HAS OBTAINED ACCESS AGREEMENTS OR WILL OBTAIN USACE PERMIT UNDER NATIONWIDE PERMIT 38, CONSTRUCTION STORMWATER DISCHARGE AND SANITARY SEWER DISCHARGE PERMITS.
5. CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY FACILITIES AND UTILITIES FOR THEMSELVES AND THE ENGINEER THROUGHOUT THE PROJECT.
6. ALL WELL AND LANDFILL GAS PROBES ABANDONMENT AND INSTALLATIONS WILL BE BY THE ENGINEER.
7. SUBSURFACE SOIL AND GROUNDWATER IS CONTAMINATED. SEE THE PROJECT HEALTH AND SAFETY PLAN FOR THE KNOWN CONTAMINANTS AND CONCENTRATIONS. WORKERS MUST HAVE CURRENT HAZWOPER TRAINING AND MEDICAL MONITORING THROUGHOUT THE PROJECT.
8. CONTRACTOR CONDUCTING WORK WITHIN THE BNSF RIGHT-OF-WAY MUST HAVE RAILROAD SAFETY TRAINING.
9. PROJECT IS REGRADING THE LANDFILL TO FLATTEN THE PERIMETER SLOPES AND CREATE A MOUND ALONG THE CENTER OF THE LANDFILL AND CONSTRUCTING AN ENGINEERED LOW-PERMEABILITY CAP.
10. IT HAS BEEN ESTIMATED THE WORK WILL BEGIN WITH MOBILIZATION IN APRIL AND END WITH FINAL HYDROSEED APPLICATION IN OCTOBER. WORK ALONG THE SHORELINE IS REQUIRED TO BE TIMED WITH THE TIDE CYCLES. NO WORK MAY OCCUR ALONG THE SHORELINE WHEN THE TIDE REACHES ELEVATION 8.0' MLLW.
11. GROUNDWATER EXTRACTION AND TREATMENT WILL BE REQUIRED TO ALLOW THE EXCAVATION TO PROCEED AND TO PREVENT RELEASE OF THE POLLUTED GROUNDWATER TO THE BAY. TREATED WATER SHALL BE DISCHARGED INTO THE SANITARY SEWER. ENGINEER WILL COLLECT AND ANALYZE CONFIRMATION SAMPLES.
12. ABOVEGROUND BERMS OUTSIDE THE FENCE MAY BE USED TO BACKFILL THE EXCAVATION OUTSIDE THE FENCE. EXISTING SANDY SOIL OVER THE LANDFILL SHALL BE SALVAGED AND USED TO BUILD THE LANDFILL GAS COLLECTION LAYER.
13. ALL SOLID WASTE IS TO BE INCORPORATED INTO THE LANDFILL. NO EXPORT OF WASTE IS PLANNED. EXCEPTIONS ARE ANY WASTE THAT DOES NOT CLASSIFY AS SOLID WASTE, E.G. BATTERIES AND WASTE GENERATED AFTER LANDFILL CAPPING IS COMPLETE.
14. ALL EARTHEN MATERIAL ABOVE THE GEOSYNTHETIC CLAY LINER WITH LAMINATION (GCLL) MUST BE APPROVED CLEAN MATERIAL IMPORTED FROM APPROVED COMMERCIAL SOURCES. TOPSOIL AND COMPOST AS WELL AS BACKFILL FOR SAND DRAINS WILL BE SELECTED AND APPROVED BY THE ENGINEER.
15. A HERONRY IS PRESENT ON THE SOUTH SIDE OF S. MARCH POINT ROAD. THERE ARE STRICT NOISE RESTRICTIONS ON THE FIELD ACTIVITIES INCLUDING EQUIPMENT OPERATIONS AND MAINTENANCE. THE GOAL IS TO KEEP NOISE LEVELS BELOW ESTABLISHED THRESHOLDS AS DESCRIBED IN THE HERON MANAGEMENT PLAN. ENGINEER WILL CONDUCT NOISE MONITORING AND WILL STOP THE OPERATIONS IF NOISE EXCEEDANCE IS NOTED.
16. THE PROJECT SEQUENCING HAS BEEN ESTABLISHED TO PROCEED FROM NORTHWEST IN THE CLOCKWISE DIRECTION SUCH THAT WHEN THE WORK REACHES THE CLOSEST POINT TO THE HERONRY WOULD BE AT THE END OF THE BREEDING SEASON. CHANGES MAY OCCUR, AS APPROVED BY THE ENGINEER.
17. THE LANDFILL HAS BEEN CONSTRUCTED OVER THE HISTORIC SHORELINE. THE ENGINEER'S ARCHEOLOGIST WILL BE ON SITE DURING EXCAVATION ON THE SOUTHEAST, SOUTH, SOUTHWEST AND WEST AREA WHERE THE ORIGINAL GRADES MAY BE REACHED. IF ARCHEOLOGICAL ARTIFACTS ARE FOUND, THE WORK IN THAT LOCATION WILL HALT UNTIL THE AREA HAS BEEN CLEARED. WORK MAY CONTINUE ELSEWHERE.
18. CONTRACTOR SHALL CONFIRM ALL UTILITIES ARE DISCONNECTED AS SHOWN INCLUDING CONFIRMING WATER (FIRELINE) IS DISCONNECTED. REPORT ANY LIVE UTILITIES TO THE CONTRACTING AGENCY. ABANDON EXISTING UTILITY PIPING IN PLACE.

100% DESIGN

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
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Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

KODIE'S TAHGEETAH — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

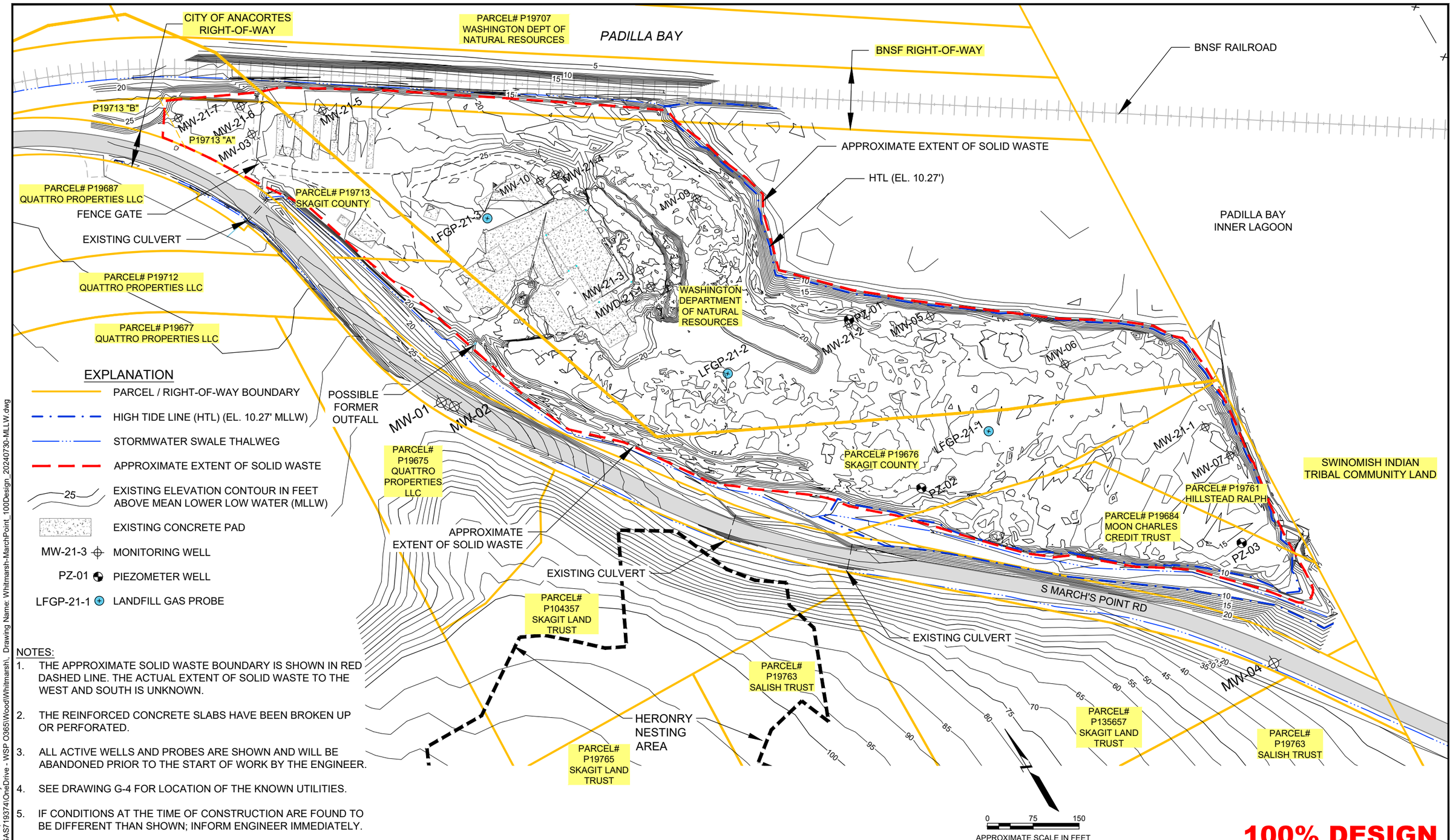
GENERAL NOTES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

DRAWING
G-2

Plot Date: 07/30/24 - 11:29am, Plotted by: USAS719374
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EXPLANATION

- PARCEL / RIGHT-OF-WAY BOUNDARY
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING CONCRETE PAD
- MW-21-3 — MONITORING WELL
- PZ-01 — PIEZOMETER WELL
- LFGP-21-1 — LANDFILL GAS PROBE

NOTES:

1. THE APPROXIMATE SOLID WASTE BOUNDARY IS SHOWN IN RED DASHED LINE. THE ACTUAL EXTENT OF SOLID WASTE TO THE WEST AND SOUTH IS UNKNOWN.
2. THE REINFORCED CONCRETE SLABS HAVE BEEN BROKEN UP OR PERFORATED.
3. ALL ACTIVE WELLS AND PROBES ARE SHOWN AND WILL BE ABANDONED PRIOR TO THE START OF WORK BY THE ENGINEER.
4. SEE DRAWING G-4 FOR LOCATION OF THE KNOWN UTILITIES.
5. IF CONDITIONS AT THE TIME OF CONSTRUCTION ARE FOUND TO BE DIFFERENT THAN SHOWN; INFORM ENGINEER IMMEDIATELY.

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REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
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HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
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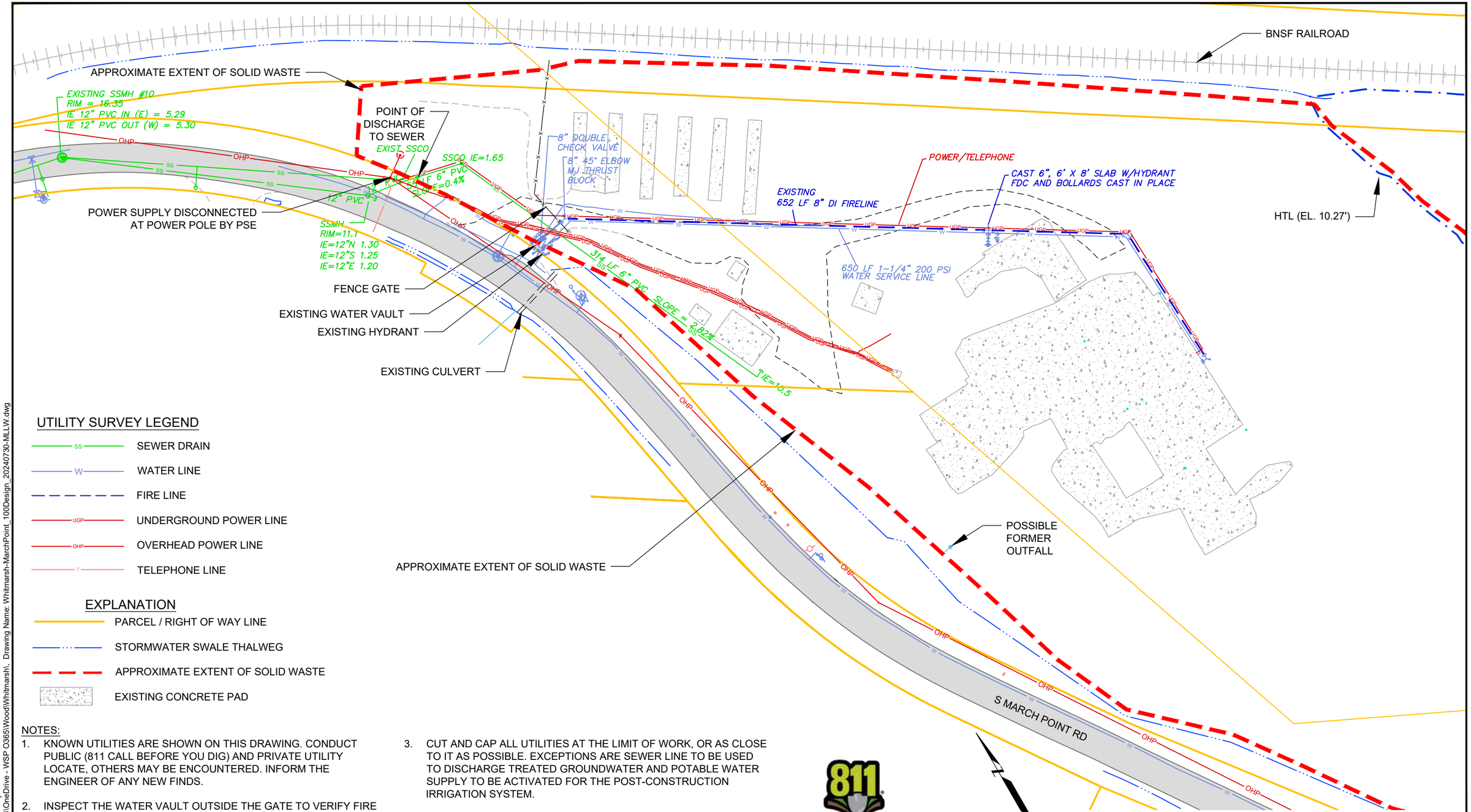
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EXISTING SITE PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING G-3

Plot Date: 07/30/24 - 11:29am, Plotted by: USAS719374
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UTILITY SURVEY LEGEND

- SS — SEWER DRAIN
- W — WATER LINE
- FIRE LINE
- UGP — UNDERGROUND POWER LINE
- OHP — OVERHEAD POWER LINE
- T — TELEPHONE LINE

EXPLANATION

- PARCEL / RIGHT OF WAY LINE
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE
- EXISTING CONCRETE PAD

NOTES:

1. KNOWN UTILITIES ARE SHOWN ON THIS DRAWING. CONDUCT PUBLIC (811 CALL BEFORE YOU DIG) AND PRIVATE UTILITY LOCATE, OTHERS MAY BE ENCOUNTERED. INFORM THE ENGINEER OF ANY NEW FINDS.
2. INSPECT THE WATER VAULT OUTSIDE THE GATE TO VERIFY FIRE LINE HAS BEEN DISCONNECTED.
3. CUT AND CAP ALL UTILITIES AT THE LIMIT OF WORK, OR AS CLOSE TO IT AS POSSIBLE. EXCEPTIONS ARE SEWER LINE TO BE USED TO DISCHARGE TREATED GROUNDWATER AND POTABLE WATER SUPPLY TO BE ACTIVATED FOR THE POST-CONSTRUCTION IRRIGATION SYSTEM.
4. AN ACTIVE HYDRANT IS PRESENT NEAR THE LANDFILL ENTRANCE. CONTRACTOR IS RESPONSIBLE AND PAY FOR WATER SUPPLY NEEDED FOR THE PROJECT.

811 Know what's below. Call before you dig.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
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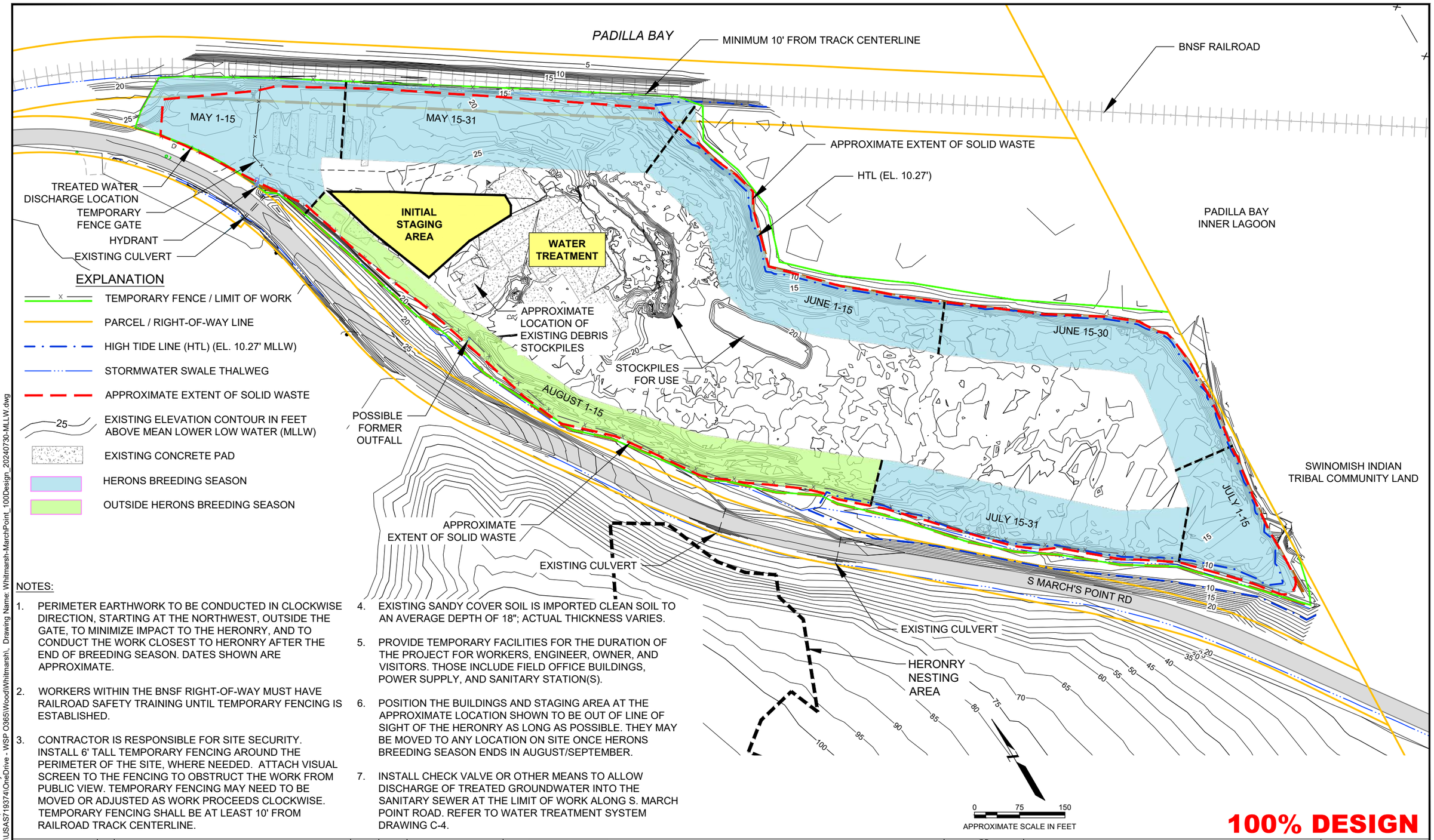
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EXISTING UTILITIES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING G-4

Plot Date: 07/30/24 - 11:29am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



NOTES:

1. PERIMETER EARTHWORK TO BE CONDUCTED IN CLOCKWISE DIRECTION, STARTING AT THE NORTHWEST, OUTSIDE THE GATE, TO MINIMIZE IMPACT TO THE HERONRY, AND TO CONDUCT THE WORK CLOSEST TO HERONRY AFTER THE END OF BREEDING SEASON. DATES SHOWN ARE APPROXIMATE.
2. WORKERS WITHIN THE BNSF RIGHT-OF-WAY MUST HAVE RAILROAD SAFETY TRAINING UNTIL TEMPORARY FENCING IS ESTABLISHED.
3. CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY. INSTALL 6' TALL TEMPORARY FENCING AROUND THE PERIMETER OF THE SITE, WHERE NEEDED. ATTACH VISUAL SCREEN TO THE FENCING TO OBSTRUCT THE WORK FROM PUBLIC VIEW. TEMPORARY FENCING MAY NEED TO BE MOVED OR ADJUSTED AS WORK PROCEEDS CLOCKWISE. TEMPORARY FENCING SHALL BE AT LEAST 10' FROM RAILROAD TRACK CENTERLINE.
4. EXISTING SANDY COVER SOIL IS IMPORTED CLEAN SOIL TO AN AVERAGE DEPTH OF 18"; ACTUAL THICKNESS VARIES.
5. PROVIDE TEMPORARY FACILITIES FOR THE DURATION OF THE PROJECT FOR WORKERS, ENGINEER, OWNER, AND VISITORS. THOSE INCLUDE FIELD OFFICE BUILDINGS, POWER SUPPLY, AND SANITARY STATION(S).
6. POSITION THE BUILDINGS AND STAGING AREA AT THE APPROXIMATE LOCATION SHOWN TO BE OUT OF LINE OF SIGHT OF THE HERONRY AS LONG AS POSSIBLE. THEY MAY BE MOVED TO ANY LOCATION ON SITE ONCE HERONS BREEDING SEASON ENDS IN AUGUST/SEPTEMBER.
7. INSTALL CHECK VALVE OR OTHER MEANS TO ALLOW DISCHARGE OF TREATED GROUNDWATER INTO THE SANITARY SEWER AT THE LIMIT OF WORK ALONG S. MARCH POINT ROAD. REFER TO WATER TREATMENT SYSTEM DRAWING C-4.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
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HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1			

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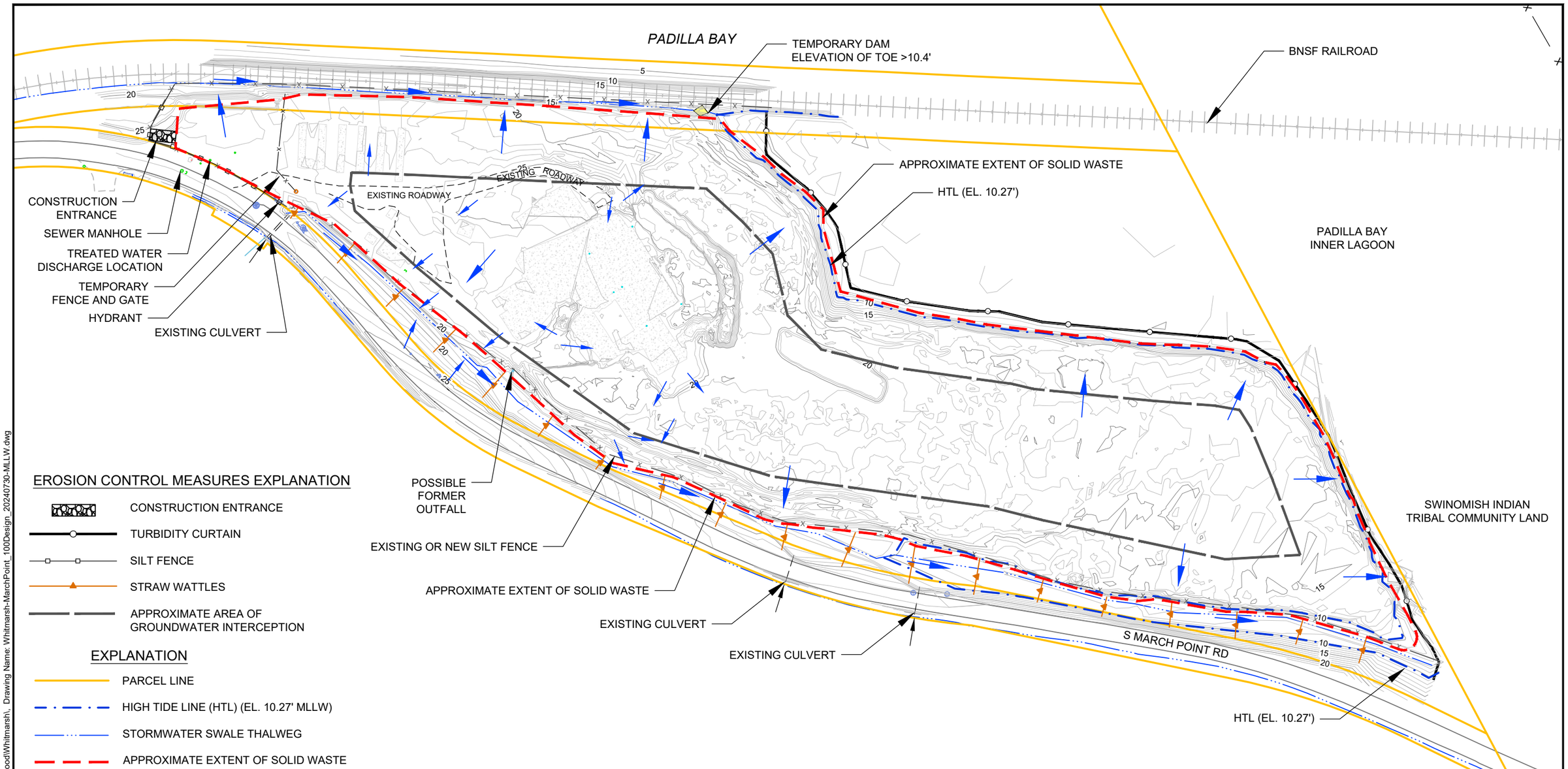
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SITE SETUP

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-1

Plot Date: 07/30/24 - 11:29am, Plotted by: USAS719374
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EROSION CONTROL MEASURES EXPLANATION

- CONSTRUCTION ENTRANCE
- TURBIDITY CURTAIN
- SILT FENCE
- STRAW WATTLES
- APPROXIMATE AREA OF GROUNDWATER INTERCEPTION

EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXTENT OF SOLID WASTE (15.3 ACRES)
- TEMPORARY FENCE
- EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- EXISTING CONCRETE PAD
- SURFACE FLOW DIRECTION

NOTES:

1. PROVIDE CESCL-CERTIFIED INSPECTOR DURING CONSTRUCTION.
2. SEE DRAWING C-3 FOR EROSION CONTROL NOTES.

0 75 150

APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
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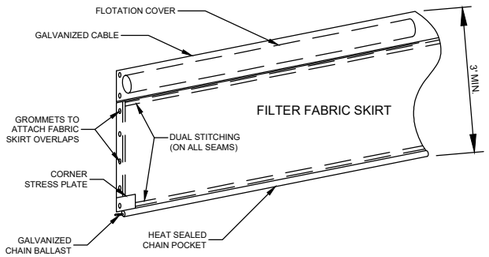
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TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

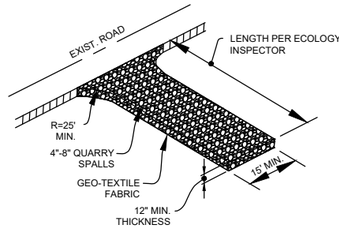
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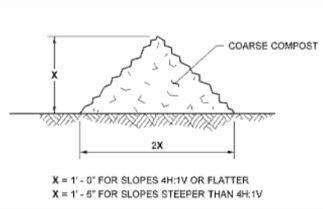
NOTES:
1. THIS DRAWING IS AN EXAMPLE ONLY.
2. FLOATS, BUOYS, LIGHTS, LINES, AND ANCHORS NOT SHOWN.
3. REFER TO MANUFACTURER'S SPECIFICATIONS FOR TURBIDITY CURTAIN REQUIREMENTS.
4. CONTRACTOR SHALL WORK WITH MANUFACTURER TO DESIGN TURBIDITY CURTAIN FOR SPECIFIC SITE CONDITIONS. SUBMIT DESIGN INFORMATION FOR ENGINEER'S APPROVAL IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
5. INSTALL AND MAINTAIN TURBIDITY CURTAIN PER MANUFACTURER INSTRUCTIONS.
6. ADDITIONAL FLOTATION AND BALLAST SHALL BE ADDED AS NEEDED TO FULLY CONTAIN TURBID WATER WITHIN THE WORK AREA AT ALL TIMES.
7. TURBIDITY CURTAIN IS TO BE KEPT IN WORKING CONDITION AT ALL TIMES. CONTRACTOR SHALL KEEP A REPAIR KIT ON-SITE AND ANY DAMAGE TO TURBIDITY CURTAIN SHALL BE REPAIRED IMMEDIATELY TO THE EXTENT PRACTICABLE. DAMAGED COMPONENTS THAT CAN NOT BE REPAIRED SHALL BE REPLACED.

1. TURBIDITY CURTAIN N.T.S.



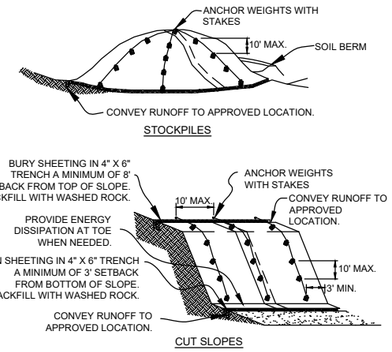
REFER TO WSDOT STANDARD PLAN I-80.10.02

2. CONSTRUCTION ENTRANCE N.T.S.

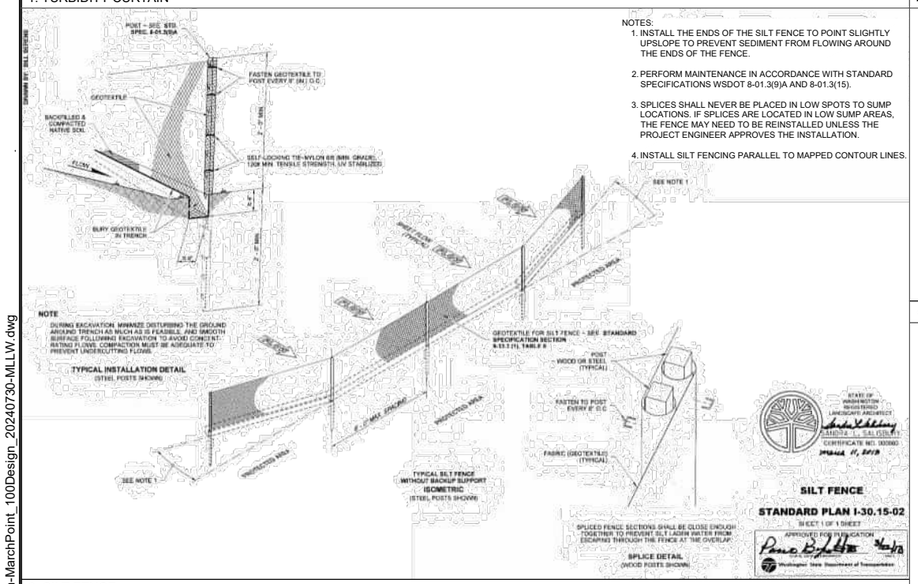


REFER TO WSDOT STANDARD PLAN I-80.10.02

4. COMPOST BERM N.T.S.

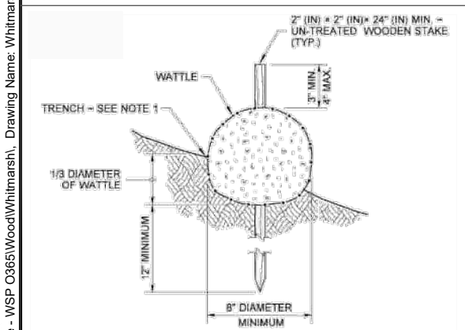


6. PLASTIC COVERING N.T.S.



NOTES:
1. INSTALL THE ENDS OF THE SILT FENCE TO POINT SLIGHTLY UPSLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
2. PERFORM MAINTENANCE IN ACCORDANCE WITH STANDARD SPECIFICATIONS WSDOT 8-01.3(9)A AND 8-01.3(15).
3. SPLICES SHALL NEVER BE PLACED IN LOW SPOTS TO SUMP LOCATIONS. IF SPLICES ARE LOCATED IN LOW SUMP AREAS, THE FENCE MAY NEED TO BE REINSTALLED UNLESS THE PROJECT ENGINEER APPROVES THE INSTALLATION.
4. INSTALL SILT FENCING PARALLEL TO MAPPED CONTOUR LINES.

3. SILT FENCE N.T.S.



NOTES:
1. WATTLES SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION, SECTION 9-14.5(5). INSTALL STRAW WATTLES ACROSS THE SWALE. INSTALLATION SHALL BE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATION, SECTION 8-01.3(10).
2. SECURELY KNOT EACH END OF WATTLE. OVERLAP ADJACENT WATTLE ENDS 12"(IN) BEHIND ONE ANOTHER AND SECURELY TIE TOGETHER.
3. COMPACT EXCAVATED SOIL AND TRENCHES TO PREVENT UNDERCUTTING. ADDITIONAL STAKING MAY BE NECESSARY TO PREVENT UNDERCUTTING.
4. INSTALL WATTLE PERPENDICULAR TO FLOW ALONG CONTOURS.
5. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RAINFALL PRODUCES RUNOFF. TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
6. PERFORM MAINTENANCE IN ACCORDANCE WITH WSDOT STANDARD SPECIFICATIONS, SECTION 8-01.3(15)
7. REFER TO WSDOT STANDARD SPECIFICATIONS, SECTION 8-01.3(16) FOR REMOVAL.

REFER TO WSDOT STANDARD PLAN I-30.30.02

5. STRAW WATTLE N.T.S.

N.T.S. = NOT TO SCALE

APPROXIMATE SCALE IN FEET

0 - - NTS

TESC NOTES:

1. THE TEMPORARY EROSION PREVENTION AND SEDIMENT CONTROL (TESC) MEASURES ON THE PLANS ARE MINIMUM REQUIREMENTS.
2. BEFORE BEGINNING ANY CONSTRUCTION ACTIVITIES, ESTABLISH THE CLEARING LIMITS, INSTALL CONSTRUCTION ENTRANCE, AND INSTALL TESC MEASURES.
3. BEFORE ANY GROUND DISTURBANCE OCCURS, ALL DOWNSTREAM TESC MEASURES MUST BE CONSTRUCTED AND IN OPERATION.
4. TESC MEASURES, INCLUDING ALL PERIMETER CONTROLS, SHALL REMAIN IN PLACE OR RELOCATED, AND MAINTAINED UNTIL FINAL SITE CONSTRUCTION IS COMPLETED AND PERMANENT STABILIZATION IS ESTABLISHED.
5. FROM MAY 1 THROUGH OCTOBER 31, PROVIDE TEMPORARY AND PERMANENT COVER MEASURES TO PROTECT DISTURBED AREAS THAT WILL REMAIN UNWORKED FOR SEVEN DAYS OR MORE.
6. DURING THE WET SEASON (NOV. 1 - APR. 30), PROVIDE TEMPORARY AND PERMANENT COVER TO PROTECT DISTURBED AREAS THAT WILL REMAIN UNWORKED FOR TWO DAYS OR MORE. ADDITIONALLY:
   A. PROTECT STOCKPILES AND STEEP CUT AND FILL SLOPES IF UNWORKED FOR MORE THAN 12 HOURS.
   B. STOCKPILE, ON SITE, ENOUGH COVER MATERIALS TO COVER ALL DISTURBED AREAS.
   C. BY OCTOBER 8, SEED ALL AREAS THAT WILL REMAIN UNWORKED DURING THE WET SEASON (OCTOBER 1 THROUGH APRIL 30). MULCH ALL SEEDED AREAS OR IMPLEMENT SIMILAR MEASURES.
7. DURING THE PROJECT, MAINTAIN IN GOOD CONDITION AND PROMPTLY REPAIR, RESTORE, OR REPLACE ALL GRADE SURFACES, DRAINS, DAMS, VEGETATION, EROSION AND SEDIMENT CONTROL MEASURES, AND OTHER PROTECTIVE DEVICES IN ACCORDANCE WITH APPROVED PLANS.
8. MONITOR DOWNSTREAM DRAINAGE FEATURES AND REMOVE ALL SEDIMENT DEPOSITION RESULTING FROM PROJECT RELATED WORK.
9. ALL WORK PERFORMED SHALL BE PER APPROVED PLANS AND SPECIFICATIONS. MAINTAIN A SET OF APPROVED PLANS AND SPECIFICATIONS AND ASSOCIATED PERMITS ON THE JOB SITE. PERFORM WORK IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS.
10. PROTECT SENSITIVE AREAS, THEIR BUFFERS, AND ADJACENT PRIVATE PROPERTIES AND PUBLIC RIGHTS-OF-WAY OR EASEMENTS FROM DAMAGE DURING GRADING OPERATIONS. RESTORE, TO THE STANDARDS IN EFFECT AT THE TIME OF THE ISSUANCE OF THE PERMIT, SENSITIVE AREAS, THEIR BUFFERS, AND PUBLIC AND PRIVATE PROPERTIES AND IMPROVEMENTS DAMAGED BY OPERATIONS.
11. COMPLY WITH THE FOLLOWING:
   A. NOTIFY THE ENGINEER WITHIN 48 HOURS FOLLOWING INSTALLATION OF TESC MEASURES.
   B. OBTAIN PERMISSION FROM THE ENGINEER PRIOR TO MODIFYING THE TESC PLAN.
   C. MAINTAIN ALL ROAD DRAINAGE SYSTEMS, STORM WATER DRAINAGE SYSTEMS, CONTROL MEASURES AND OTHER FACILITIES.
   D. REPAIR ANY SILTATION OR EROSION DAMAGES TO ADJOINING PROPERTIES AND DRAINAGE FACILITIES.
   E. INSPECT ACCORDING TO THE APPROVED TESC INSPECTION SCHEDULE SPECIFIED IN CONSTRUCTION STORMWATER DISCHARGE PERMIT AND MAKE NEEDED REPAIRS IMMEDIATELY.

SLOPE STABILIZATION:
1. SHREDDED BARK MULCH SHALL BE APPLIED TO EXPOSED SOILS AT ELEVATION +10.27' MLLW OR HIGHER WITHIN TWO DAYS UPON COMPLETION OF FINAL GRADING.
2. EXCAVATION, GRADING, AND PLACEMENT OF FILL BELOW ELEVATION 10.27' MLLW SHALL BE COORDINATED WITH TIDAL INUNDATIONS TO MINIMIZE SUSPENSION OF SEDIMENT. SLOPES AT ELEVATIONS LOWER THAN 10.27' MLLW SHALL BE NO STEEPER THAN 4H:1V WHEN SUBJECT TO TIDAL INUNDATION.
3. TEMPORARY AND PERMANENT SLOPES STEEPER THAN 3H:1V SHALL BE ROUGHENED BY "TRACK WALKING" CRAWLER EQUIPMENT UP AND DOWN THE SLOPE.
4. INSTALL SLOPE STABILIZATION MEASURES IN ACCORDANCE WITH LANDSCAPING PLAN AND SPECIFICATIONS AS SOON AS PRACTICABLE UPON COMPLETION OF GRADING.
5. UPON COMPLETION OF GRADING, IMPLEMENT SURFACE ROUGHENING, THEN PROVIDE AND MAINTAIN TEMPORARY SEED AND MULCH ABOVE ELEVATION 10.27' MLLW UNTIL PERMANENT LANDSCAPING IS INSTALLED.

PERIMETER CONTROLS
1. INSTALL TESC MEASURES PRIOR TO EARTH DISTURBING ACTIVES TO ISOLATE WORK AREAS FROM ADJACENT PROPERTIES AND TO PREVENT RUNOFF FROM ENTERING OR LEAVING THE SITE, WHEN POSSIBLE.
2. MAINTAIN THE TURBIDITY CURTAIN AND OTHER MEASURES DURING THE WORK SUCH THAT THEY ARE EFFECTIVE. REPLACE DAMAGED MEASURES TO MAINTAIN GOOD WORKING ORDER.
3. MODIFY, RELOCATE, OR ADD EROSION CONTROL MEASURES TO ACHIEVE THE OBJECTIVE OF MINIMIZING ENTRY OF SEDIMENT INTO THE BAY.

TEMPORARY STOCKPILES:
1. WHERE EROSION OF MATERIAL CAN OCCUR, TEMPORARY STOCKPILES SHALL BE LINED UNDERNEATH AND SURROUNDED BY EARTH DIKES AND COVERED WITH 10 MIL PLASTIC COVERING. RUNOFF COLLECTED IN STOCKPILE AREAS SHALL BE ROUTED TO THE STORMWATER HOLDING TANKS.

TIRE WASH:
1. TIRE WASH FACILITIES MAY BE NEEDED AT SITE EGRESS LOCATIONS WHERE SEDIMENT MAY BE TRACKED ONTO PAVED ROADS BY VEHICLES. THE CONTRACTOR SHALL DESIGN AND IMPLEMENT TIRE WASH FACILITIES IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS AND PERMITS FOR TIRE WASH FACILITIES.

DEWATERING, TREATMENT AND DISCHARGE:
1. REMOVE GROUNDWATER TO CONDUCT THE WORK AND TO PREVENT DISCHARGE OF GROUNDWATER INTO THE BAY DURING EARTHWORK ALONG THE PERIMETER.
2. GROUNDWATER EXTRACTION MAY BE FROM A TRENCH OR PITS ALONG THE APPROXIMATE ALIGNMENT SHOWN ON DRAWING C-2. PUMP THE WATER TO THE SETTLING TANKS OF THE WATER TREATMENT SYSTEM.
3. COLLECT AND TREAT ALL WATER GENERATED ON SITE (STORMWATER AND GROUNDWATER) AND DISCHARGE INTO THE SANITARY SEWER.
4. THE ENGINEER WILL TEST THE TREATED WATER. DISCHARGE THE TREATED WATER ONLY AFTER RECEIVING APPROVAL FROM THE ENGINEER. TREATED WATER NOT MEETING THE ALLOWABLE DISCHARGE LIMITS SHALL BE TREATED AGAIN.

POST CONSTRUCTION SOIL MANAGEMENT:
1. HYDROSEED THE COMPLETED SURFACES AND PLANT VEGETATION IN ACCORDANCE WITH THE RESTORATION PLANS.

TESC PLAN SUPPLEMENTAL INFORMATION:
1. RESTORE THE STAGING AREA(S) UPON DEMOBILIZATION.
2. PREVENT DEBRIS FROM ENTERING THE BAY TO THE MAXIMUM EXTENT PRACTICABLE. REMOVE ANY SUCH DEBRIS DAILY, OR AS INSTRUCTED BY THE ENGINEER.
3. COORDINATE TIMING OF EXCAVATION, AND GRADING WITH TIDAL AND SWALE LEVEL FLUCTUATION TO MINIMIZE RELEASE OF DEBRIS AND SEDIMENT.
4. WHEN WORKING WITHIN THE TIDAL ZONE, LIMIT THE AREA OF GRADING AND EXCAVATION TO THAT WHICH CAN BE PERFORMED AND STABILIZED WITHIN A SINGLE TIDAL CYCLE, BEFORE WATER RISES TO ELEVATION 8.0' MLLW.
5. ADDITIONAL TESC MEASURES MAY BE NEEDED AT DIFFERENT STAGES OF WORK. MODIFY AS NEEDED TO MEET THE INTENT OF THE STORMWATER POLLUTION PREVENTION PLAN.
6. USE TEMPORARY PUMPS AND HOSES TO TRANSFER GROUNDWATER AND STORMWATER TO THE HOLDING TANKS.
7. CLEAN ROADWAYS IF ANY SOILS HAS TRACKED OUTSIDE THE WORK AREA.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1			

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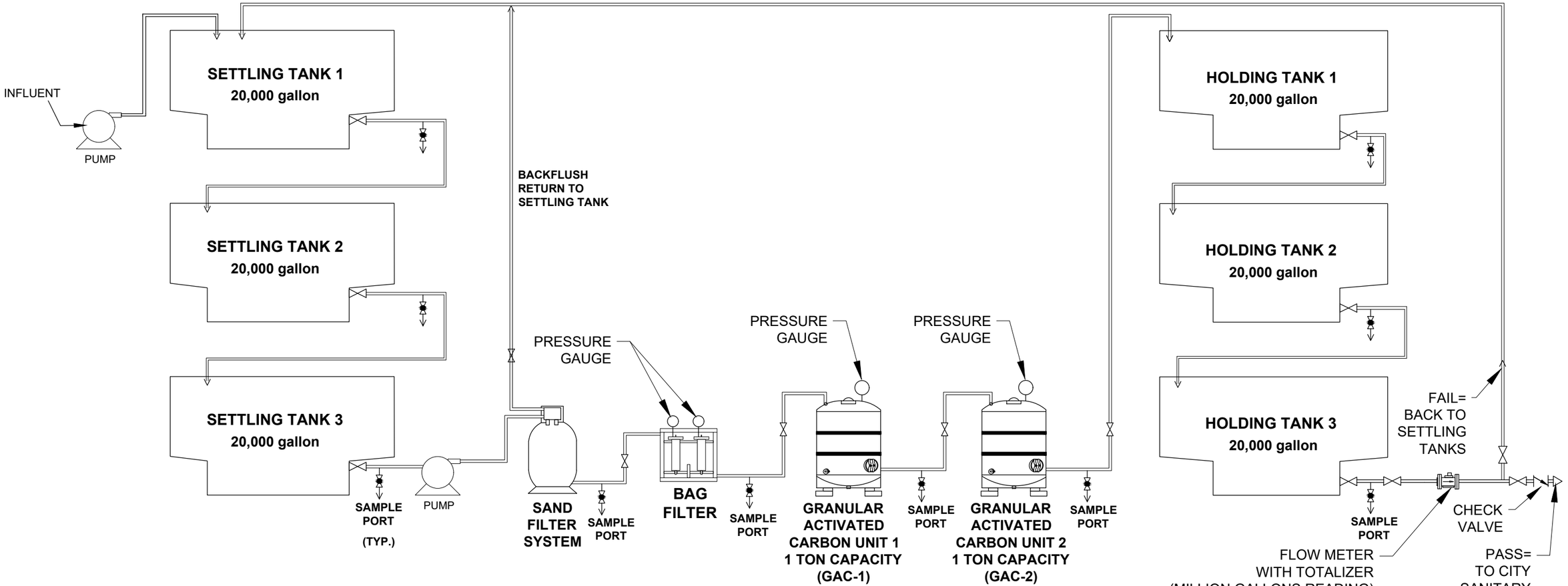
KORUS TAHGHIGHI STATE OF WASHINGTON 22240 REGISTERED PROFESSIONAL ENGINEER

TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) NOTES AND DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-3

Plot Date: 07/30/24 - 11:30am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



LEGEND

- VALVE
- BALL VALVE
- PRESSURE GAUGE

NOTES:

1. OUTLET OF SETTLING TANK TO BE A MINIMUM OF 1 FOOT FROM BOTTOM OF TANK TO PREVENT SETTLEABLE SOLIDS FROM LEAVING TANK.
2. MAXIMUM FLOW OF SYSTEM SHALL BE 150 GALLONS PER MINUTE (GPM), UNLESS APPROVED BY THE ENGINEER.
3. FLOW METER FLOW RANGE SHALL BE 0-250 GPM.
4. VALVES AND SAMPLE PORTS SHALL BE RUST-PROOF METAL.
5. OBTAIN PERMIT FROM THE CITY OF ANACORTES PUBLIC WORKS DEPARTMENT TO INSTALL A CHECK VALVE, OR AS SPECIFIED BY THE CITY, AT THE DISCHARGE LOCATION SHOWN ON DRAWING C-1.
6. INSTALL, OPERATE, AND MAINTAIN THE SYSTEM STARTING THE DAY THE ENGINEER AUTHORIZES ITS OPERATION UNTIL THE ENGINEER INSTRUCTS TO DISCONTINUE.
7. RELOCATE THE SYSTEM AS NEEDED TO COMPLETE THE WORK.
8. THE ENGINEER WILL OBTAIN DISCHARGE PERMIT. ENGINEER WILL COLLECT AND ANALYZE THE WATER SAMPLES. CONTRACTOR SHALL ASSUME THAT ONLY BATCH DISCHARGES MAY BE MADE.
9. THE ENGINEER WILL OBTAIN APPROVAL TO DISCHARGE FROM THE CITY AND WILL NOTIFY CONTRACTOR. IF CITY DOES NOT APPROVE DISCHARGE, RETURN THE WATER TO THE SETTLING TANK AND TREAT AGAIN.
10. CLEAN AND DECONTAMINATE ALL THE COMPONENTS AT THE COMPLETION OF PROJECT. ENGINEER WILL COLLECT CONFIRMATION SAMPLES.

100% DESIGN

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
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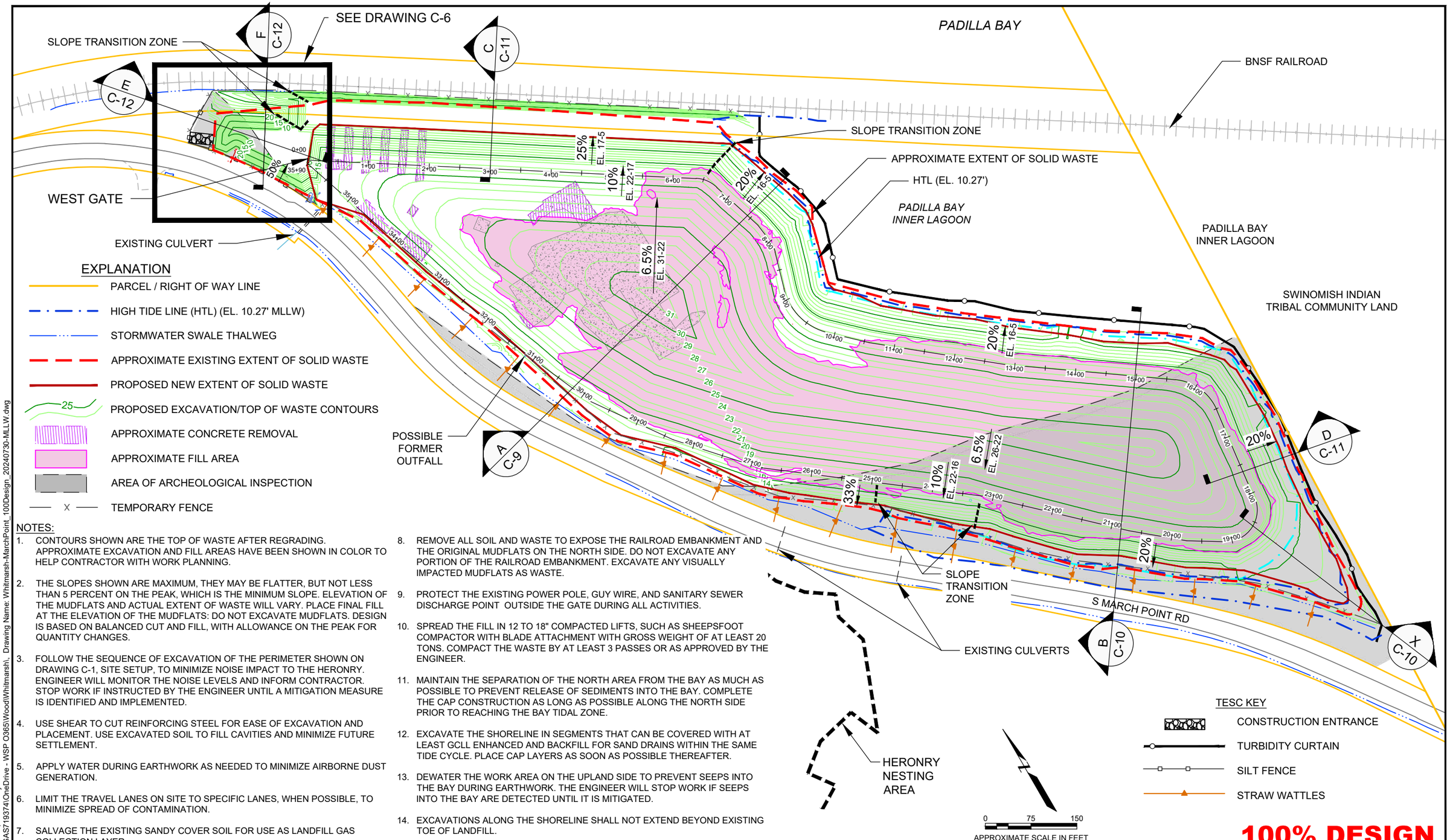
KODIAK TAHGLICHI STATE OF WASHINGTON 32240 REGISTERED PROFESSIONAL ENGINEER

WATER TREATMENT SYSTEM

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-4

Plot Date: 07/30/24 - 11:30am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



EXPLANATION

- PARCEL / RIGHT OF WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- APPROXIMATE EXISTING EXTENT OF SOLID WASTE
- PROPOSED NEW EXTENT OF SOLID WASTE
- 25 — PROPOSED EXCAVATION/TOP OF WASTE CONTOURS
- APPROXIMATE CONCRETE REMOVAL
- APPROXIMATE FILL AREA
- AREA OF ARCHEOLOGICAL INSPECTION
- —— X —— TEMPORARY FENCE

TESC KEY

- CONSTRUCTION ENTRANCE
- TURBIDITY CURTAIN
- SILT FENCE
- STRAW WATTLES

NOTES:

1. CONTOURS SHOWN ARE THE TOP OF WASTE AFTER REGRADING. APPROXIMATE EXCAVATION AND FILL AREAS HAVE BEEN SHOWN IN COLOR TO HELP CONTRACTOR WITH WORK PLANNING.
2. THE SLOPES SHOWN ARE MAXIMUM, THEY MAY BE FLATTER, BUT NOT LESS THAN 5 PERCENT ON THE PEAK, WHICH IS THE MINIMUM SLOPE. ELEVATION OF THE MUDFLATS AND ACTUAL EXTENT OF WASTE WILL VARY. PLACE FINAL FILL AT THE ELEVATION OF THE MUDFLATS: DO NOT EXCAVATE MUDFLATS. DESIGN IS BASED ON BALANCED CUT AND FILL, WITH ALLOWANCE ON THE PEAK FOR QUANTITY CHANGES.
3. FOLLOW THE SEQUENCE OF EXCAVATION OF THE PERIMETER SHOWN ON DRAWING C-1, SITE SETUP, TO MINIMIZE NOISE IMPACT TO THE HERONRY. ENGINEER WILL MONITOR THE NOISE LEVELS AND INFORM CONTRACTOR. STOP WORK IF INSTRUCTED BY THE ENGINEER UNTIL A MITIGATION MEASURE IS IDENTIFIED AND IMPLEMENTED.
4. USE SHEAR TO CUT REINFORCING STEEL FOR EASE OF EXCAVATION AND PLACEMENT. USE EXCAVATED SOIL TO FILL CAVITIES AND MINIMIZE FUTURE SETTLEMENT.
5. APPLY WATER DURING EARTHWORK AS NEEDED TO MINIMIZE AIRBORNE DUST GENERATION.
6. LIMIT THE TRAVEL LANES ON SITE TO SPECIFIC LANES, WHEN POSSIBLE, TO MINIMIZE SPREAD OF CONTAMINATION.
7. SALVAGE THE EXISTING SANDY COVER SOIL FOR USE AS LANDFILL GAS COLLECTION LAYER.
8. REMOVE ALL SOIL AND WASTE TO EXPOSE THE RAILROAD EMBANKMENT AND THE ORIGINAL MUDFLATS ON THE NORTH SIDE. DO NOT EXCAVATE ANY PORTION OF THE RAILROAD EMBANKMENT. EXCAVATE ANY VISUALLY IMPACTED MUDFLATS AS WASTE.
9. PROTECT THE EXISTING POWER POLE, GUY WIRE, AND SANITARY SEWER DISCHARGE POINT OUTSIDE THE GATE DURING ALL ACTIVITIES.
10. SPREAD THE FILL IN 12 TO 18" COMPACTED LIFTS, SUCH AS SHEEPSFOOT COMPACTOR WITH BLADE ATTACHMENT WITH GROSS WEIGHT OF AT LEAST 20 TONS. COMPACT THE WASTE BY AT LEAST 3 PASSES OR AS APPROVED BY THE ENGINEER.
11. MAINTAIN THE SEPARATION OF THE NORTH AREA FROM THE BAY AS MUCH AS POSSIBLE TO PREVENT RELEASE OF SEDIMENTS INTO THE BAY. COMPLETE THE CAP CONSTRUCTION AS LONG AS POSSIBLE ALONG THE NORTH SIDE PRIOR TO REACHING THE BAY TIDAL ZONE.
12. EXCAVATE THE SHORELINE IN SEGMENTS THAT CAN BE COVERED WITH AT LEAST GCLL ENHANCED AND BACKFILL FOR SAND DRAINS WITHIN THE SAME TIDE CYCLE. PLACE CAP LAYERS AS SOON AS POSSIBLE THEREAFTER.
13. DEWATER THE WORK AREA ON THE UPLAND SIDE TO PREVENT SEEPS INTO THE BAY DURING EARTHWORK. THE ENGINEER WILL STOP WORK IF SEEPS INTO THE BAY ARE DETECTED UNTIL IT IS MITIGATED.
14. EXCAVATIONS ALONG THE SHORELINE SHALL NOT EXTEND BEYOND EXISTING TOE OF LANDFILL.

100% DESIGN

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

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KOREUS TAHGTIGHT — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

TOP OF WATER GRADES

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-5

Plot Date: 07/30/24 - 11:30am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\WoodWhitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg

UTILITY SURVEY LEGEND

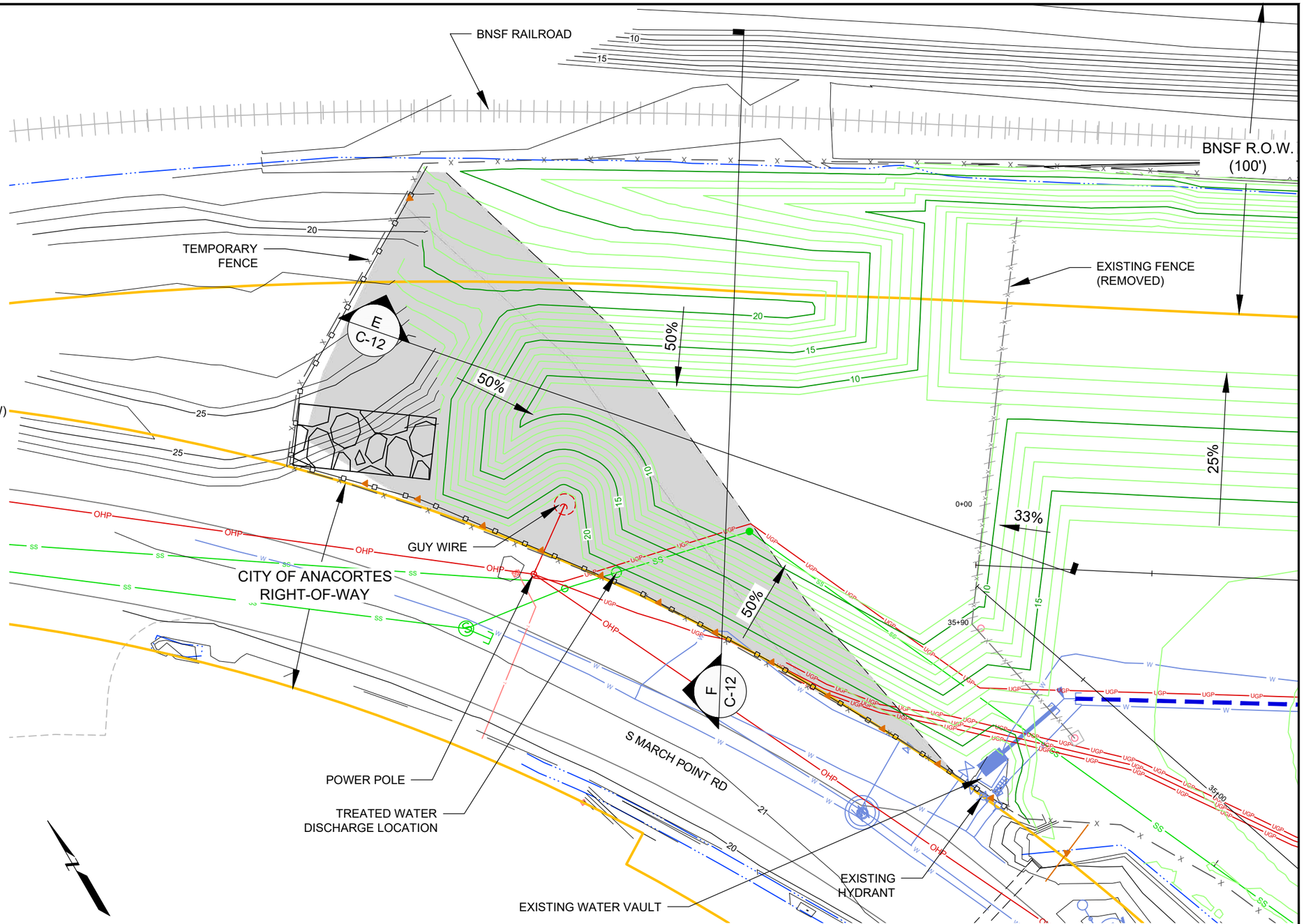
- SS — SEWER DRAIN
- W — WATER LINE
- FIRE LINE
- UGP — UNDERGROUND POWER LINE
- OHP — OVERHEAD POWER LINE
- T — TELEPHONE LINE

EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- STORMWATER SWALE THALWEG
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED EXCAVATION CONTOURS
- CONSTRUCTION ENTRANCE
- AREA OF ARCHEOLOGICAL INSPECTION
- X — TEMPORARY FENCE
- SILT FENCE
- STRAW WATTLES

NOTES:

1. THE EXISTING UTILITY LINES ARE SHOWN FOR REFERENCE. CONTRACTOR TO VERIFY THEY ARE DEACTIVATED AT THE START OF PROJECT.
2. SALVAGE EXISTING ABOVEGROUND EARTHEN BERM SOIL WITHIN LIMIT OF WORK TO BACKFILL EXCAVATION, OUTSIDE THE GATE.
3. DO NOT PLACE TEMPORARY FENCING OR EXCAVATE WITHIN THE CITY OF ANACORTES RIGHT-OF-WAY. THE BOUNDARY WILL BE STAKED BY THE ENGINEER.
4. PROTECT THE POWER POLE AND GUY WIRE DURING EXCAVATION; MAINTAIN A MINIMUM OF 3' SEPARATION DURING EXCAVATION.
5. EXCAVATE ANY SOLID WASTE OUTSIDE THE LANDFILL FENCE. EXCAVATE AT A STABLE SLOPE, ASSUMED TO BE APPROXIMATELY 50%, BUT MAY BE STEEPER IF STABLE.
6. SEQUENCE THE WORK TO MAINTAIN SITE ACCESS.
7. DEWATER EXCAVATION TO ACHIEVE COMPLETE REMOVAL OF SOLID WASTE OUTSIDE THE FENCE. PROCESS THE WATER THROUGH THE TREATMENT SYSTEM.
8. BACKFILL THE EXCAVATION WITH COMPACTED LAYERS OF SALVAGED BERM SOIL AND IMPORTED GRANULAR FILL TO APPROXIMATELY WITHIN 4" OF FINAL GRADE.



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APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
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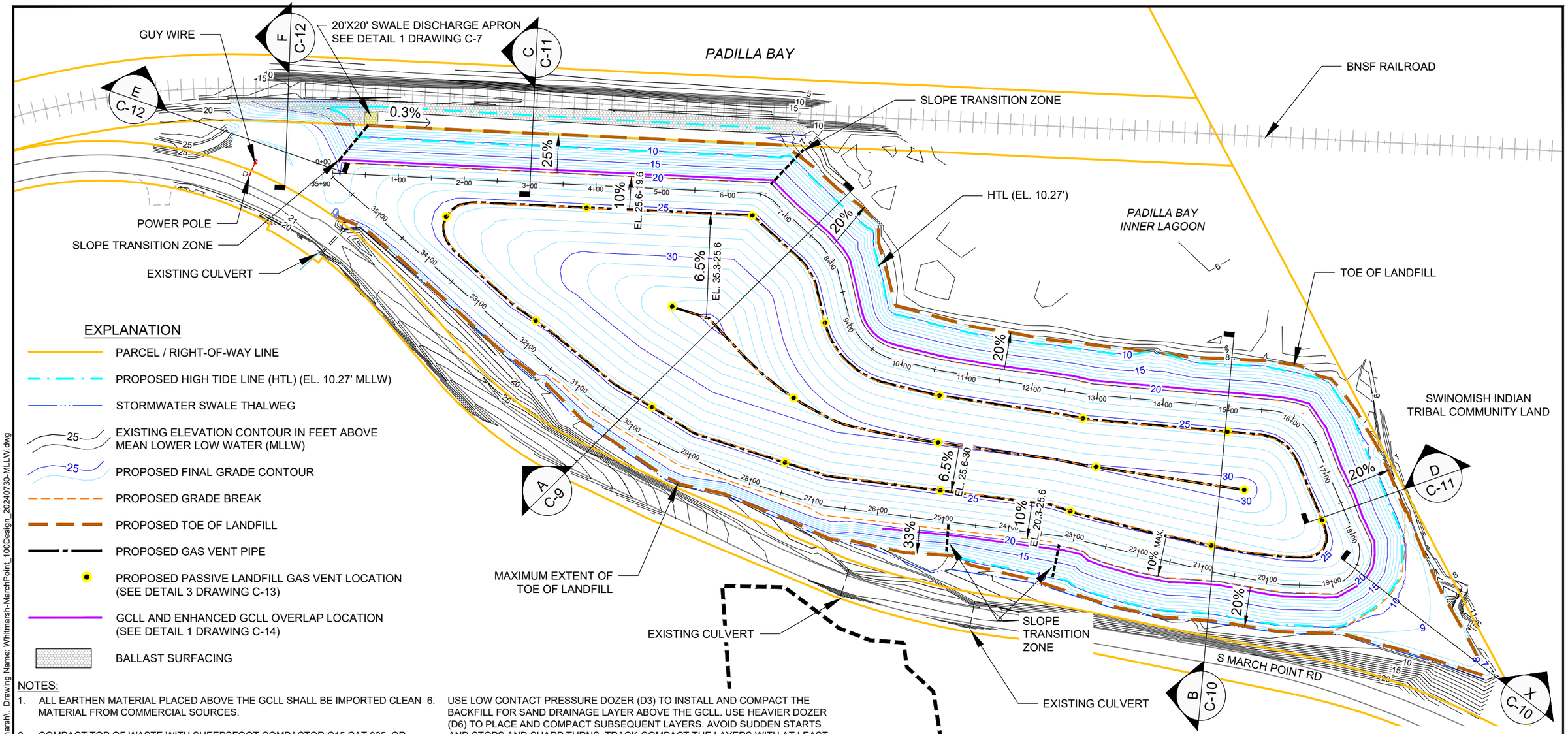
KYORUS TAIGHLEE — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

GATE ENTRANCE EXCAVATION

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-6

Plot Date: 07/30/24 - 11:31am, Plotted by: USAS719374
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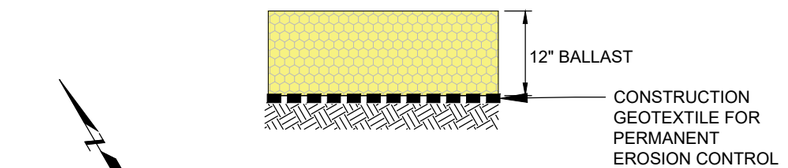


EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- PROPOSED HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED GAS VENT PIPE
- PROPOSED PASSIVE LANDFILL GAS VENT LOCATION (SEE DETAIL 3 DRAWING C-13)
- GCLL AND ENHANCED GCLL OVERLAP LOCATION (SEE DETAIL 1 DRAWING C-14)
- BALLAST SURFACING

NOTES:

1. ALL EARTHEN MATERIAL PLACED ABOVE THE GCLL SHALL BE IMPORTED CLEAN MATERIAL FROM COMMERCIAL SOURCES.
2. COMPACT TOP OF WASTE WITH SHEEPSFOOT COMPACTOR C15 CAT 825, OR EQUAL, BY AT LEAST 3 PASSES OR AS DIRECTED BY THE ENGINEER.
3. INSTALL LFG COLLECTION AND VENTING PIPES AT THE FIRST GRADE BREAK AND AT THE LANDFILL RIDGE.. ALLOW INSPECTION AND ACCEPTANCE OF THE LFG PIPING BY THE ENGINEER PRIOR TO COVERING IT.
4. USE THE SALVAGED SANDY COVER SOIL TO CONSTRUCT THE GAS COLLECTION LAYER (LFG) AND PIPING. TRACK-COMPACT THE SURFACE PRIOR TO PLACEMENT OF GCLL.
5. INSTALL THE GCLL FROM THE TOE UP AND SHINGLE THE SEPARATE PIECES TO THE TOP OF THE LANDFILL WITH MINIMUM 2' OF OVERLAP. INSTALL GCLL ENHANCED PARALLEL TO THE TO OF THE LANDFILL ALONG PERIMETER SLOPES. ELEVATION 16' ALONG THE SHORELINE IS THE LOCATION OF CHANGE FROM GCLL TO GCLL ENHANCED.
6. USE LOW CONTACT PRESSURE DOZER (D3) TO INSTALL AND COMPACT THE BACKFILL FOR SAND DRAINAGE LAYER ABOVE THE GCLL. USE HEAVIER DOZER (D6) TO PLACE AND COMPACT SUBSEQUENT LAYERS. AVOID SUDDEN STARTS AND STOPS AND SHARP TURNS. TRACK-COMPACT THE LAYERS WITH AT LEAST 3 PASSES, OR AS DIRECTED BY THE ENGINEER.
7. INSTALL A LAYER OF CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL PRIOR TO PLACEMENT OF SELECT BORROW LAYER.
8. COVER THE EXPOSED RAILROAD EMBANKMENT WITH A LAYER OF GCLL AND ADD A 12" LAYER OF BALLAST OVER IT AND DRESS.
9. FINAL CAP LAYER BELOW ELEVATION 10.27' ALONG THE WATER WAY SHALL BE BACKFILL FOR SAND DRAINS.
10. SEE CROSS SECTIONS AND DETAILS FOR THE CAP LAYERING AND RESTORATION DRAWINGS FOR PLANTINGS AND HYDROSEED OF THE SURFACE.



1 SWALE DISCHARGE APRON DETAIL
NOT TO SCALE

0 75 150
APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

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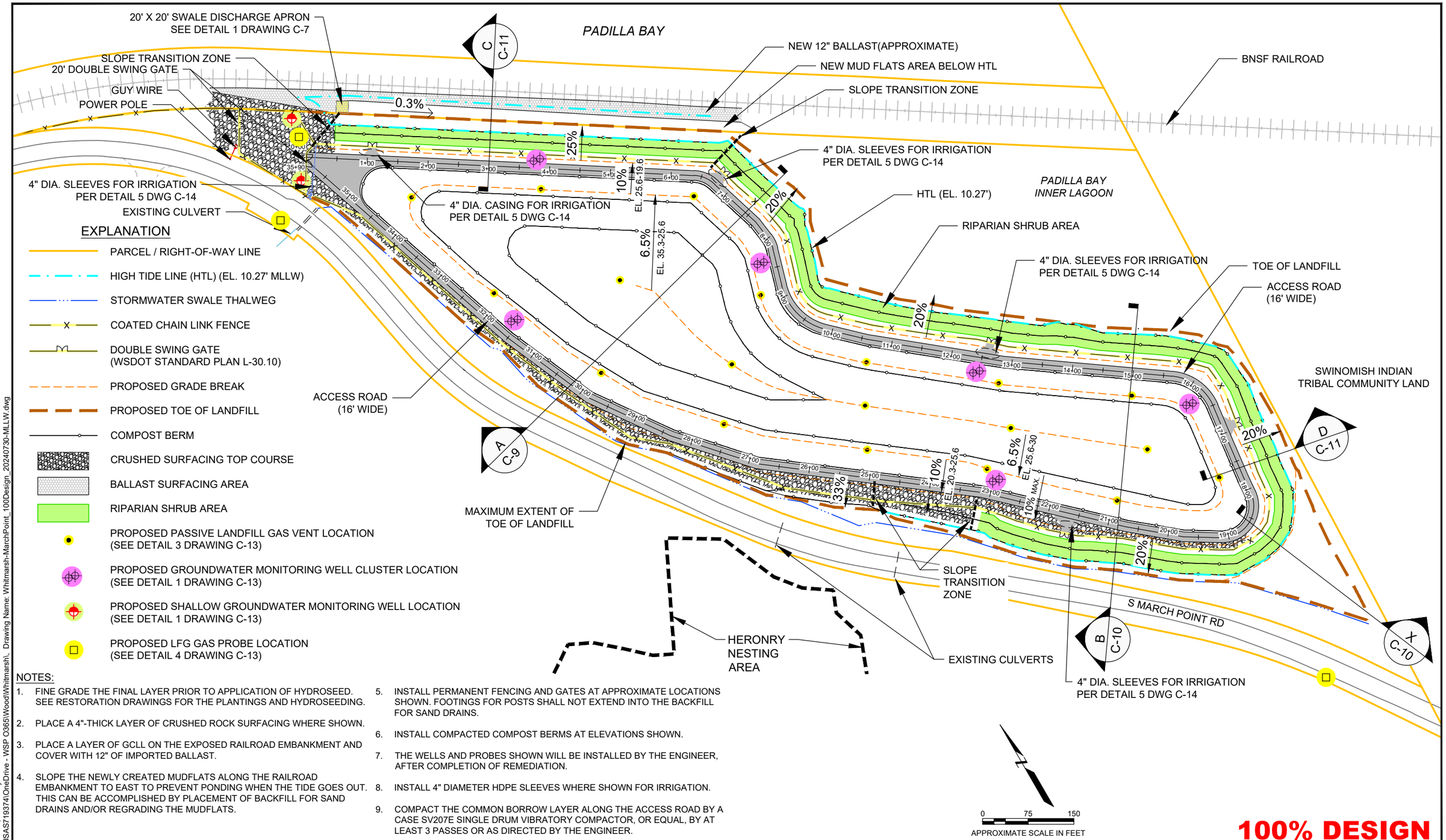
KORUS TANGHATI
STATE OF WASHINGTON
32240
REGISTERED
PROFESSIONAL ENGINEER

FINAL GRADING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-7

Plot Date: 07/30/24 - 11:31am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- COMPOST BERM
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PROPOSED PASSIVE LANDFILL GAS VENT LOCATION (SEE DETAIL 3 DRAWING C-13)
- PROPOSED GROUNDWATER MONITORING WELL CLUSTER LOCATION (SEE DETAIL 1 DRAWING C-13)
- PROPOSED SHALLOW GROUNDWATER MONITORING WELL LOCATION (SEE DETAIL 1 DRAWING C-13)
- PROPOSED LFG GAS PROBE LOCATION (SEE DETAIL 4 DRAWING C-13)

NOTES:

1. FINE GRADE THE FINAL LAYER PRIOR TO APPLICATION OF HYDROSEED. SEE RESTORATION DRAWINGS FOR THE PLANTINGS AND HYDROSEEDING.
2. PLACE A 4"-THICK LAYER OF CRUSHED ROCK SURFACING WHERE SHOWN.
3. PLACE A LAYER OF GCLL ON THE EXPOSED RAILROAD EMBANKMENT AND COVER WITH 12" OF IMPORTED BALLAST.
4. SLOPE THE NEWLY CREATED MUDFLATS ALONG THE RAILROAD EMBANKMENT TO EAST TO PREVENT PONDING WHEN THE TIDE GOES OUT. THIS CAN BE ACCOMPLISHED BY PLACEMENT OF BACKFILL FOR SAND DRAINS AND/OR REGRADING THE MUDFLATS.
5. INSTALL PERMANENT FENCING AND GATES AT APPROXIMATE LOCATIONS SHOWN. FOOTINGS FOR POSTS SHALL NOT EXTEND INTO THE BACKFILL FOR SAND DRAINS.
6. INSTALL COMPACTED COMPOST BERMS AT ELEVATIONS SHOWN.
7. THE WELLS AND PROBES SHOWN WILL BE INSTALLED BY THE ENGINEER, AFTER COMPLETION OF REMEDIATION.
8. INSTALL 4" DIAMETER HDPE SLEEVES WHERE SHOWN FOR IRRIGATION.
9. COMPACT THE COMMON BORROW LAYER ALONG THE ACCESS ROAD BY A CASE SV207E SINGLE DRUM VIBRATORY COMPACTOR, OR EQUAL, BY AT LEAST 3 PASSES OR AS DIRECTED BY THE ENGINEER.

0 75 150
APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

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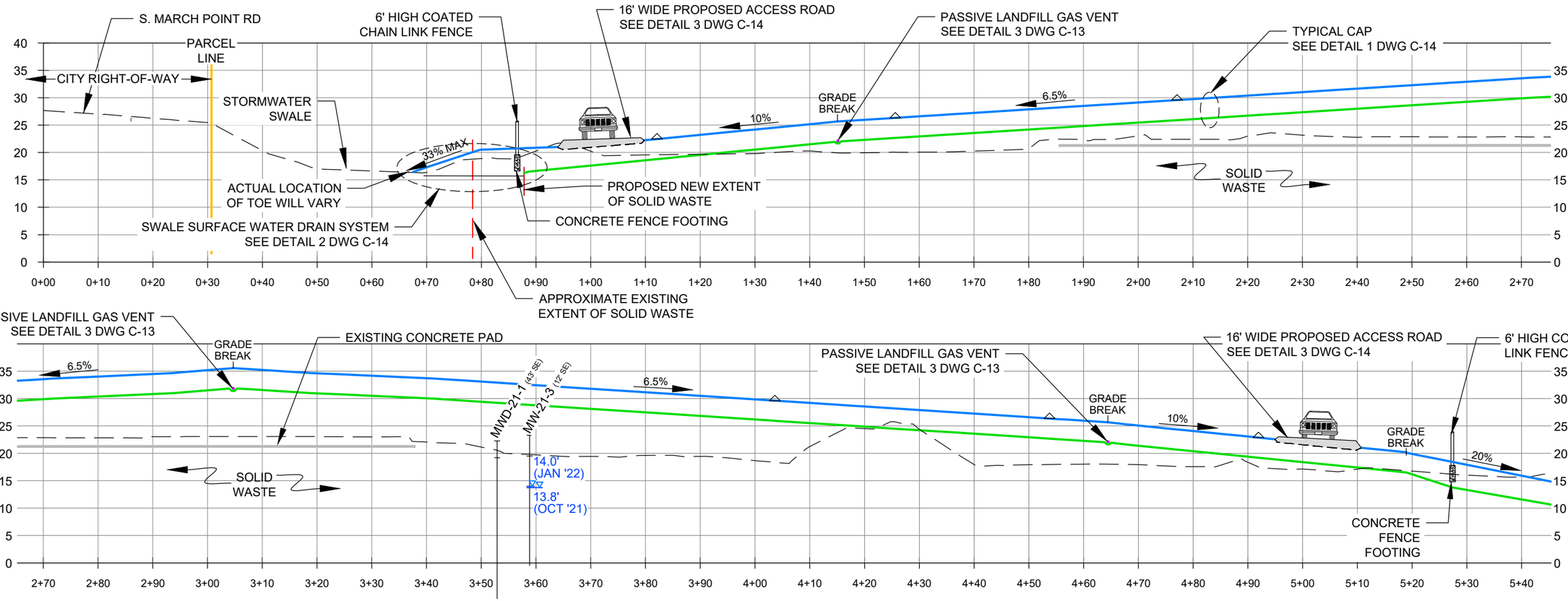
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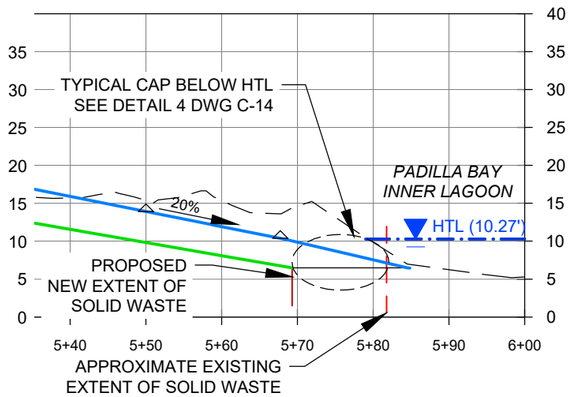
FINAL SITE PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-8

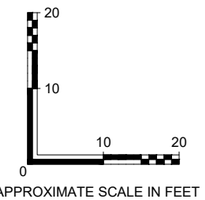
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Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg





A CROSS SECTION A

Scale: AS SHOWN



APPROXIMATE SCALE IN FEET

CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 13.69' (OCT '21) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

1. THE ACTUAL EXTENT OF WASTE ALONG THE SOUTH/SOUTHWEST SWALE IS UNKNOWN; IT DOES NOT EXTEND TO THE SWALE CENTERLINE. EARTHWORK ALONG THE SWALE IS INTENDED TO MINIMIZE THE WASTE FOOTPRINT, ELIMINATE OR MINIMIZE THE TREES TO BE REMOVED, AND ALLOW FOR LANDFILL CAP BACKFILL FOR SAND DRAINS AND SELECT BORROW LAYERS TO DRAIN TO THE SWALE. ADJUST CONSTRUCTION TO ACHIEVE THE OBJECTIVE.
2. INSTALL DRAIN ROCK CHANNELS EVERY 50'. WHERE THE SWALE BANK DOES NOT NEED TO BE REPLACED, AS DIRECTED BY THE ENGINEER. SEE DETAIL 2 ON DRAWING C-14.
3. MUDFLATS ELEVATION OF 5' HAS BEEN USED FOR THE PURPOSE OF THE DESIGN; ACTUAL ELEVATION WILL VARY. ADJUST THE SLOPE ALONG THE SHORELINE WITH CHANGES IN THE ELEVATION OF MUDFLATS; SLOPES SHOWN ARE MAXIMUM, EXCEPT NEAR THE TOP WHERE 5 PERCENT SLOPE IS MINIMUM.
4. FINAL ACCESS ROAD SHALL BE AT LEAST 12' WIDE AT THE BASE AND 16' WIDE ON THE SURFACE. SEPARATE THE SELECT BORROW FROM THE SOIL WITH A LAYER OF CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL.
5. GROUNDWATER INFORMATION SHOWN IS APPROXIMATE, ACTUAL ELEVATIONS AT THE TIME OF WORK MAY VARY.

100% DESIGN

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

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Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

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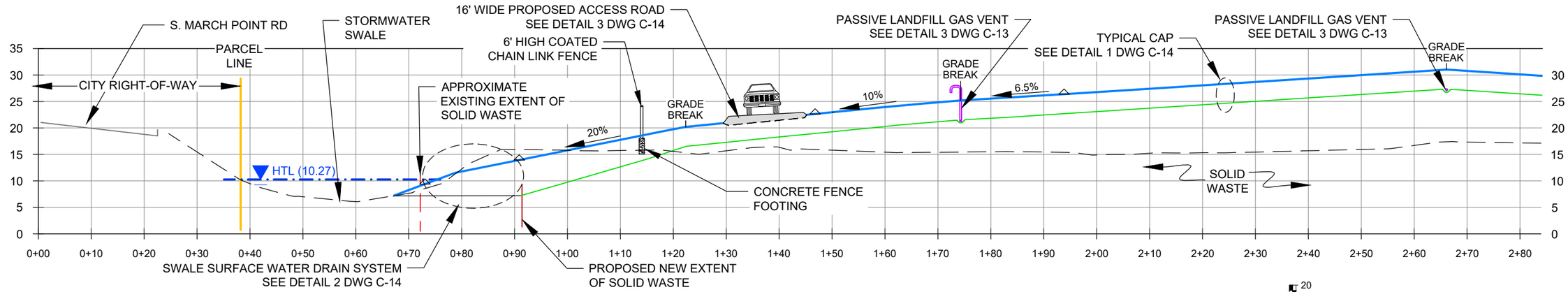
CROSS SECTION A

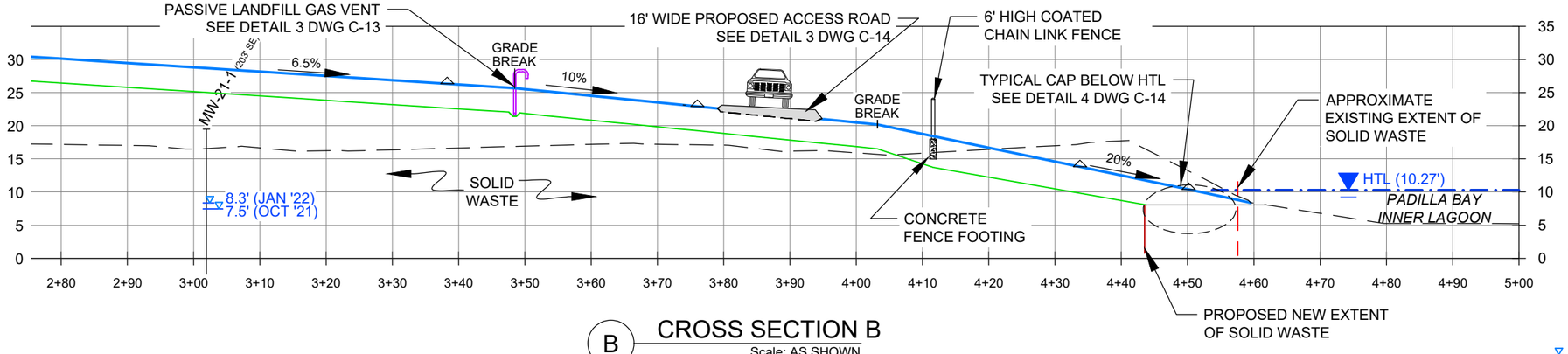
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

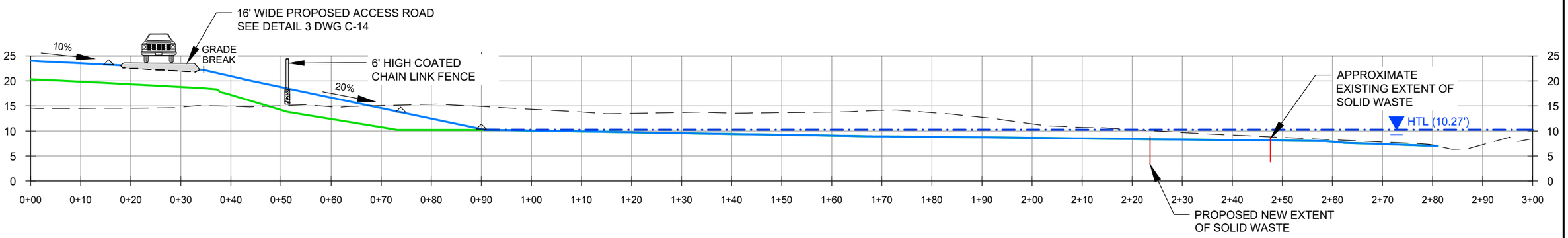
DRAWING C-9

Plot Date: 07/30/24 - 11:32am Plotted by: USAS719374
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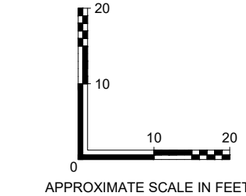




B **CROSS SECTION B**
Scale: AS SHOWN



X **CROSS SECTION SE CORNER**
Scale: AS SHOWN



APPROXIMATE SCALE IN FEET

CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 7.46' (OCT '21) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

SEE NOTES ON DRAWING C-9.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

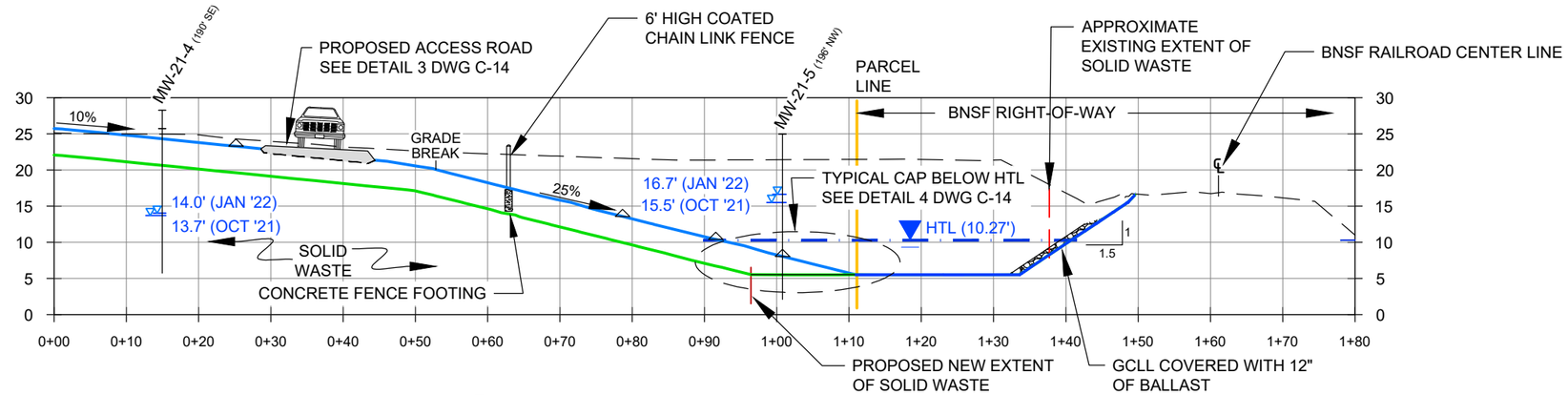
KODIES TAHGHTHI — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

CROSS SECTIONS B and X

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

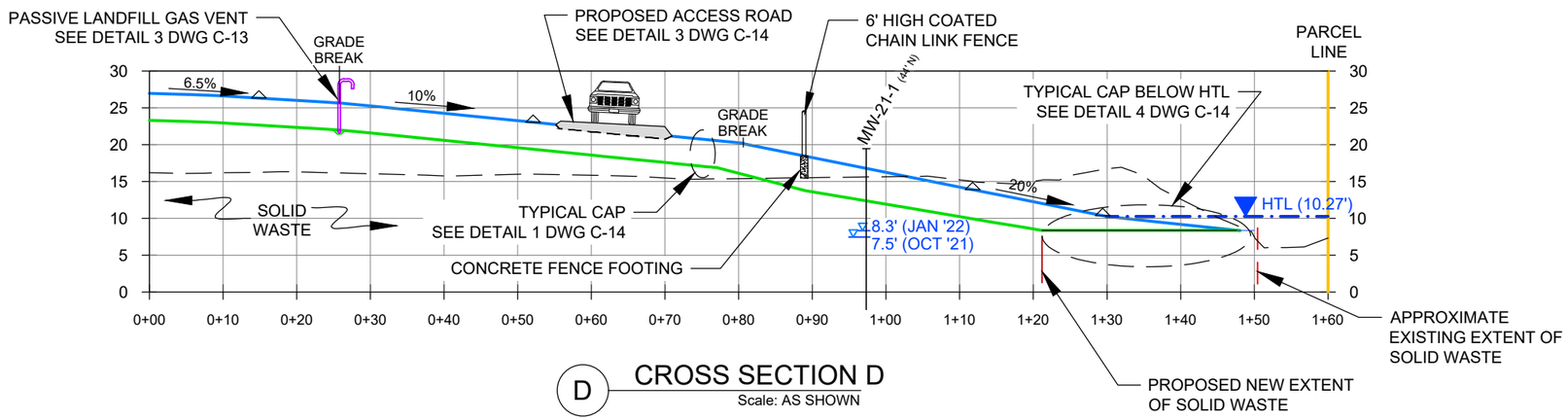
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DRAWING C-10

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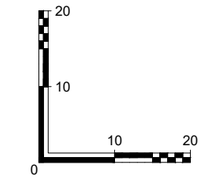
C CROSS SECTION C

Scale: AS SHOWN



D CROSS SECTION D

Scale: AS SHOWN



APPROXIMATE SCALE IN FEET

CROSS SECTION EXPLANATION

- EXISTING GRADE
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE
- COMPOST BERM
- 14.0' (JAN '22) GROUNDWATER ELEVATION IN MLLW-FT (DATE)

NOTES:

SEE NOTES ON DRAWING C-9.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

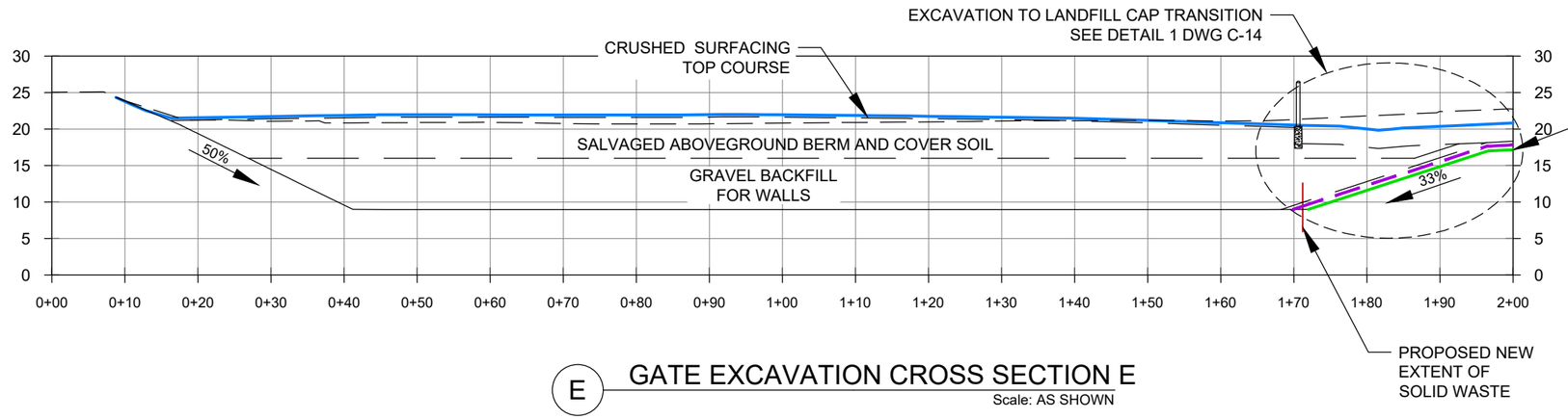
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Redmond, Washington 98052

CROSS SECTIONS C and D

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

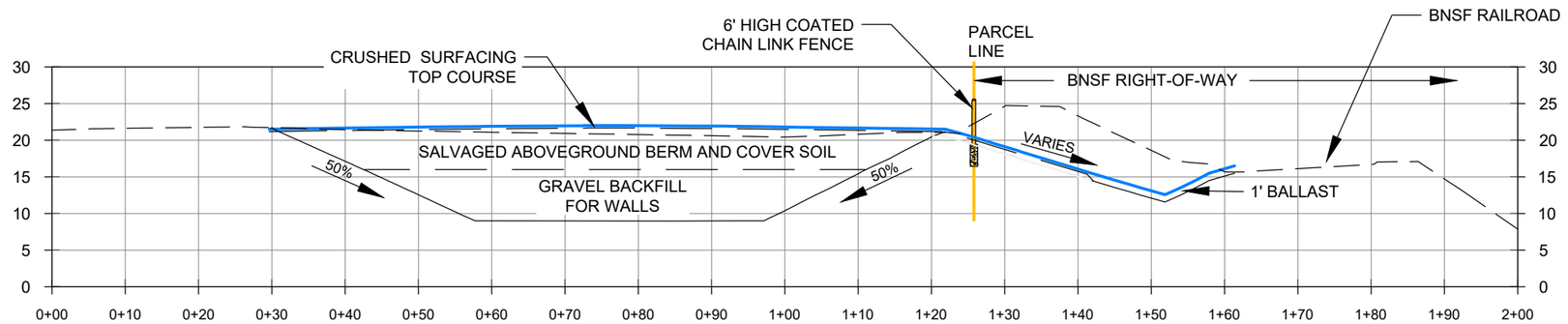
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PROJECT NO.: PS21204410
DRAWING C-11

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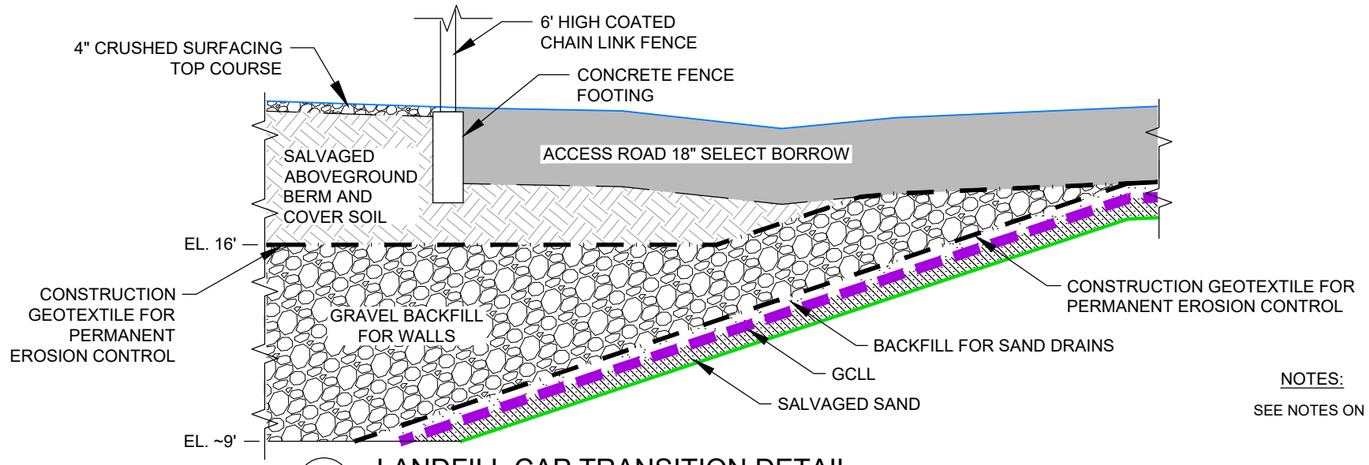
E GATE EXCAVATION CROSS SECTION E

Scale: AS SHOWN



F GATE EXCAVATION CROSS SECTION F

Scale: AS SHOWN

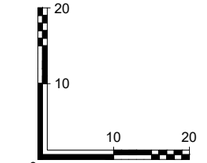


1 LANDFILL CAP TRANSITION DETAIL

NOT TO SCALE

CROSS SECTION EXPLANATION

- EXISTING GRADE
- BOTTOM OF EXCAVATION
- PROPOSED FINAL GRADE
- PROPOSED TOP OF REFUSE



APPROXIMATE SCALE IN FEET

NOTES:

SEE NOTES ON DRAWING C-9.

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.	1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

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Redmond, Washington 98052

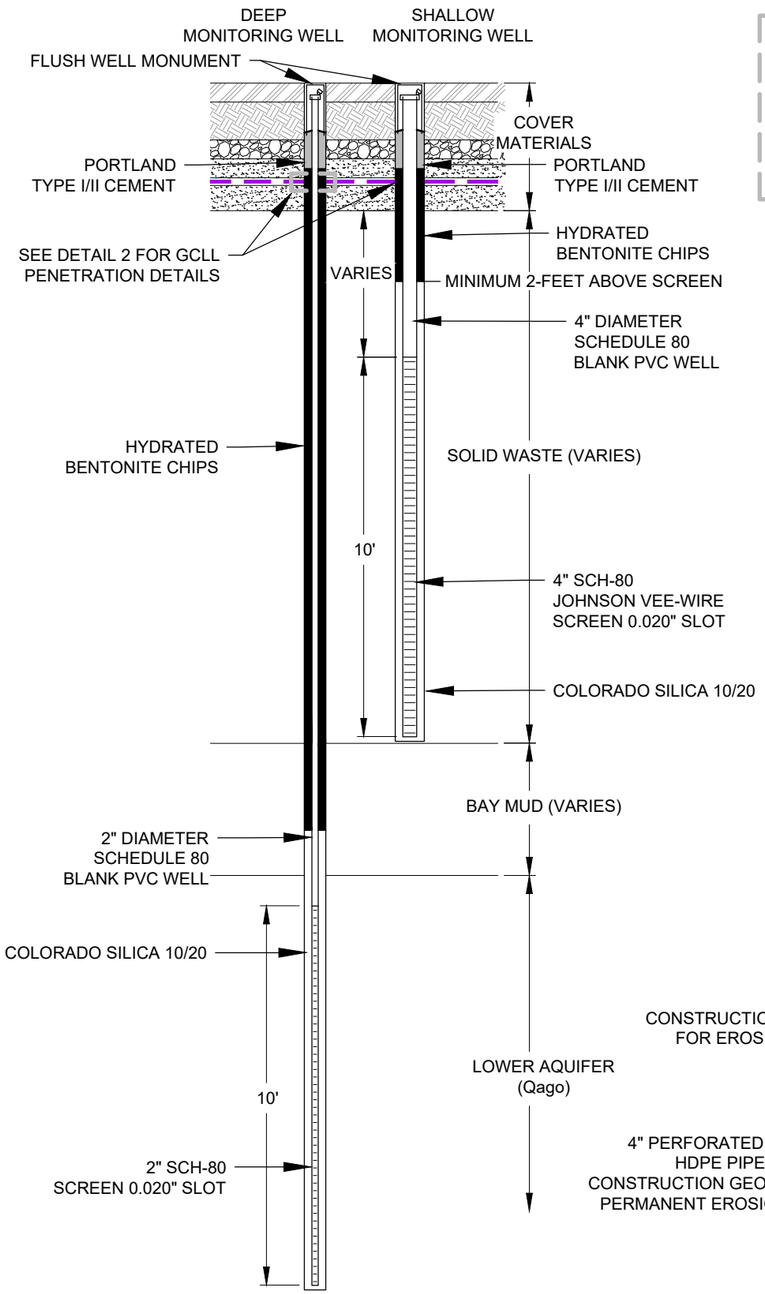
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STATE OF WASHINGTON
32240
REGISTERED
PROFESSIONAL ENGINEER

CROSS SECTIONS E and F

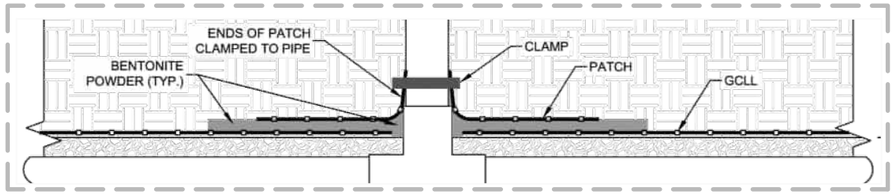
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-12

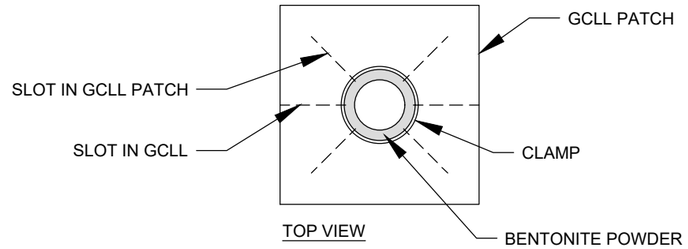
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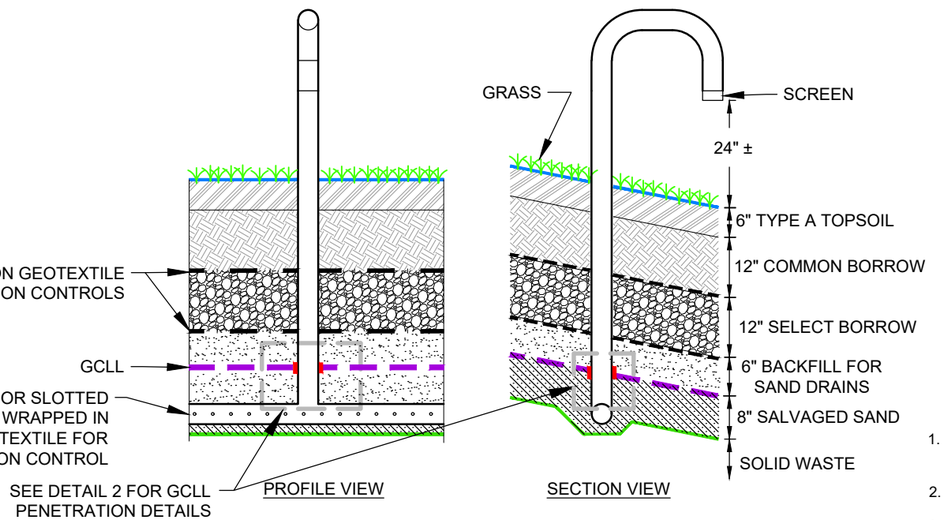
1 GROUNDWATER MONITORING WELL PAIR
(BY THE ENGINEER) NOT TO SCALE



PATCH PROFILE VIEW

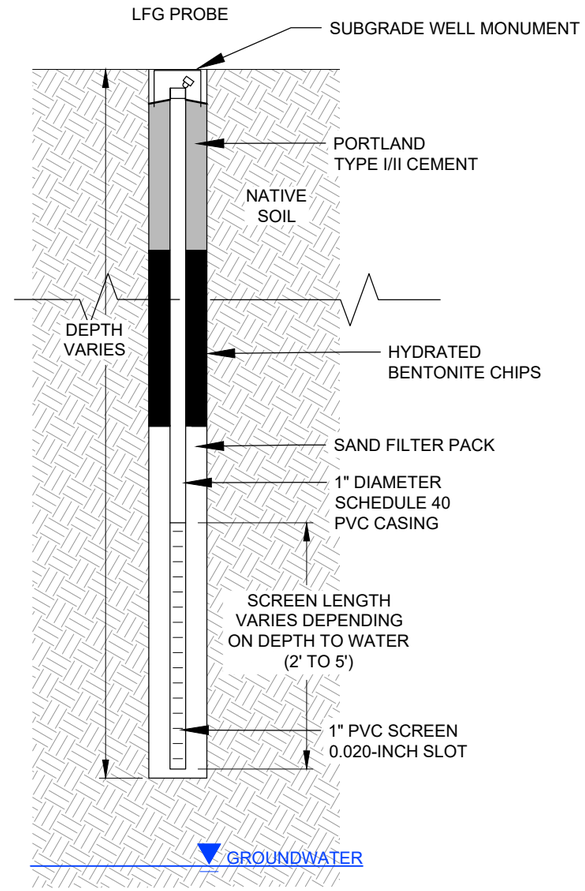


TOP VIEW



2 GCLL PENETRATION DETAIL
NOT TO SCALE

3 PASSIVE LANDFILL GAS VENT DETAIL
NOT TO SCALE



4 LFG PROBE DETAIL
(BY THE ENGINEER) NOT TO SCALE

NOTES:

1. THE ENGINEER WILL INSTALL MONITORING WELLS AND GAS PROBES IN ACCORDANCE WITH STATE OF WASHINGTON WELL REGULATIONS.
2. WELL INSTALLATION WILL OCCUR AFTER COMPLETION OF THE PROJECT.
3. WORK INVOLVES EXCAVATING THE CAP TO THE GEOSYNTHETIC CLAY LAYER. THE SEAL RESTORATION SHALL BE IN ACCORDANCE WITH DETAIL 2, DRAWING C-13.

100% DESIGN

REFERENCES:
PLANS
DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

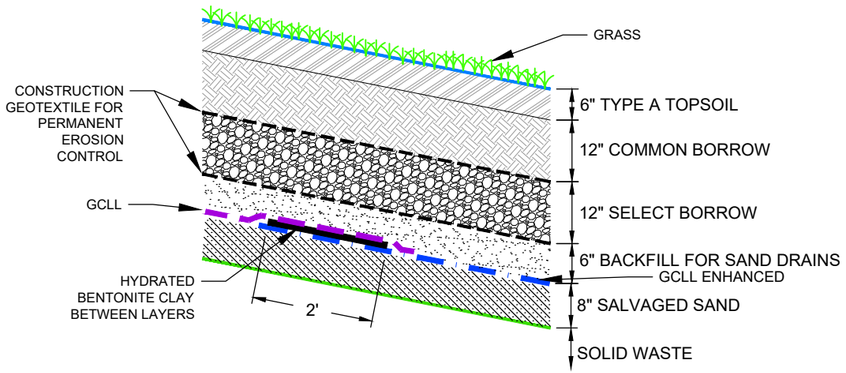
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Redmond, Washington 98052

DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

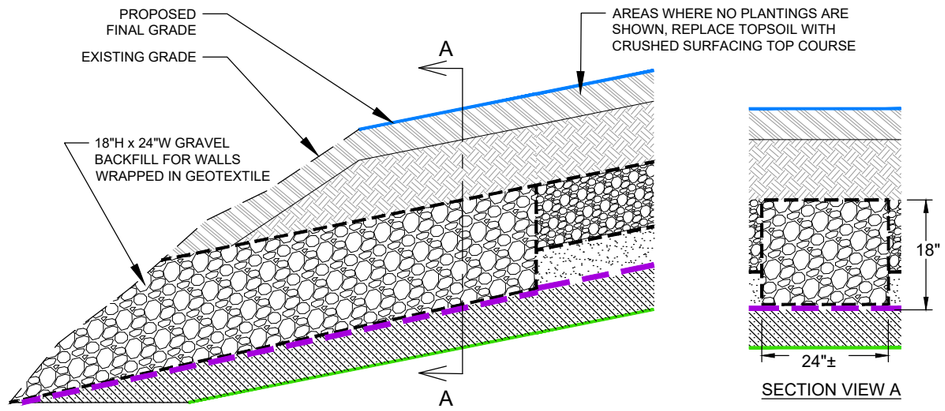
DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-13

Plot Date: 07/30/24 - 11:33am, Plotted by: USAS719374
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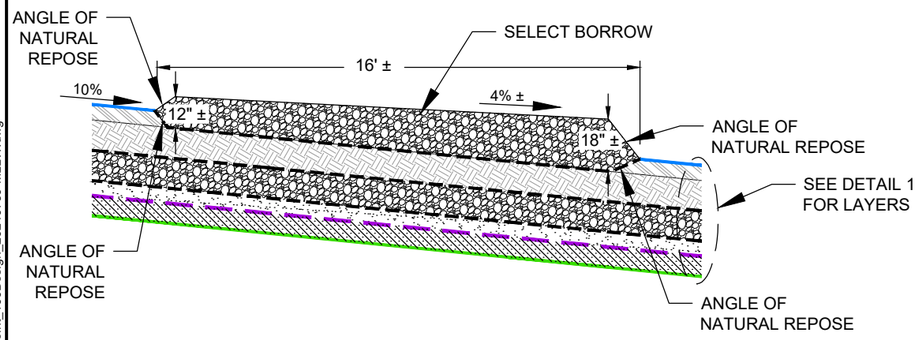
1 CAP AND GCLL OVERLAP DETAIL (EL. 16')

NOT TO SCALE



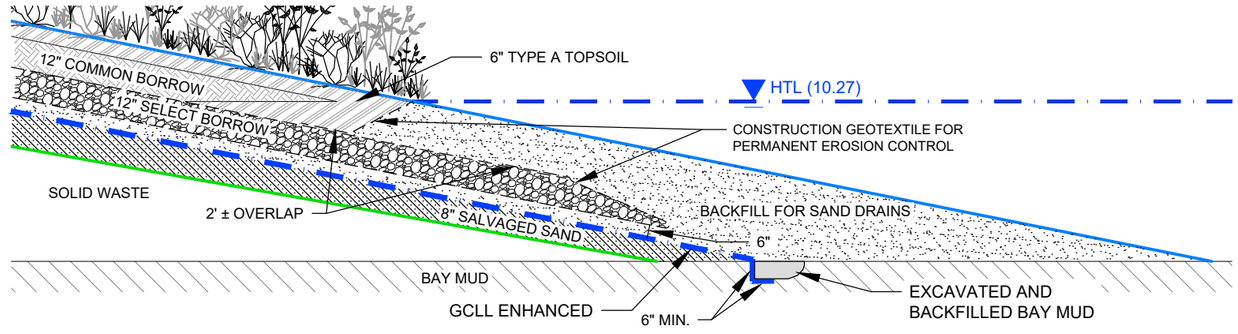
2 18"H X 24"W DRAIN ROCK DETAIL INTO SWALE

NOT TO SCALE



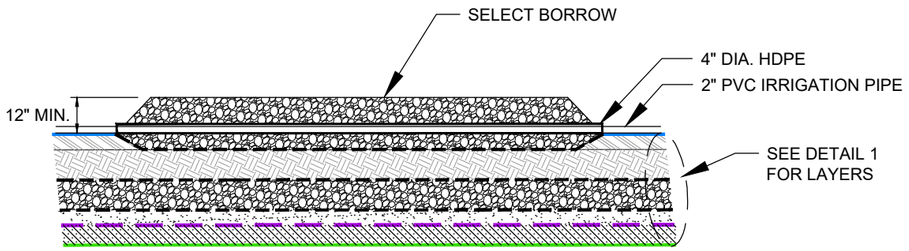
3 ACCESS ROAD DETAIL

NOT TO SCALE



4 CAP DETAIL BELOW HTL

NOT TO SCALE



5 IRRIGATION CROSSING AT ACCESS ROADS DETAIL

NOT TO SCALE

KEY

- TYPE A TOP SOIL
- COMMON BORROW
- SELECT BORROW
- SAND
- SALVAGED SAND
- CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL
- GCLL
- ENHANCED GCLL

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

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18300 Redmond Way, Suite 200
Redmond, Washington 98052

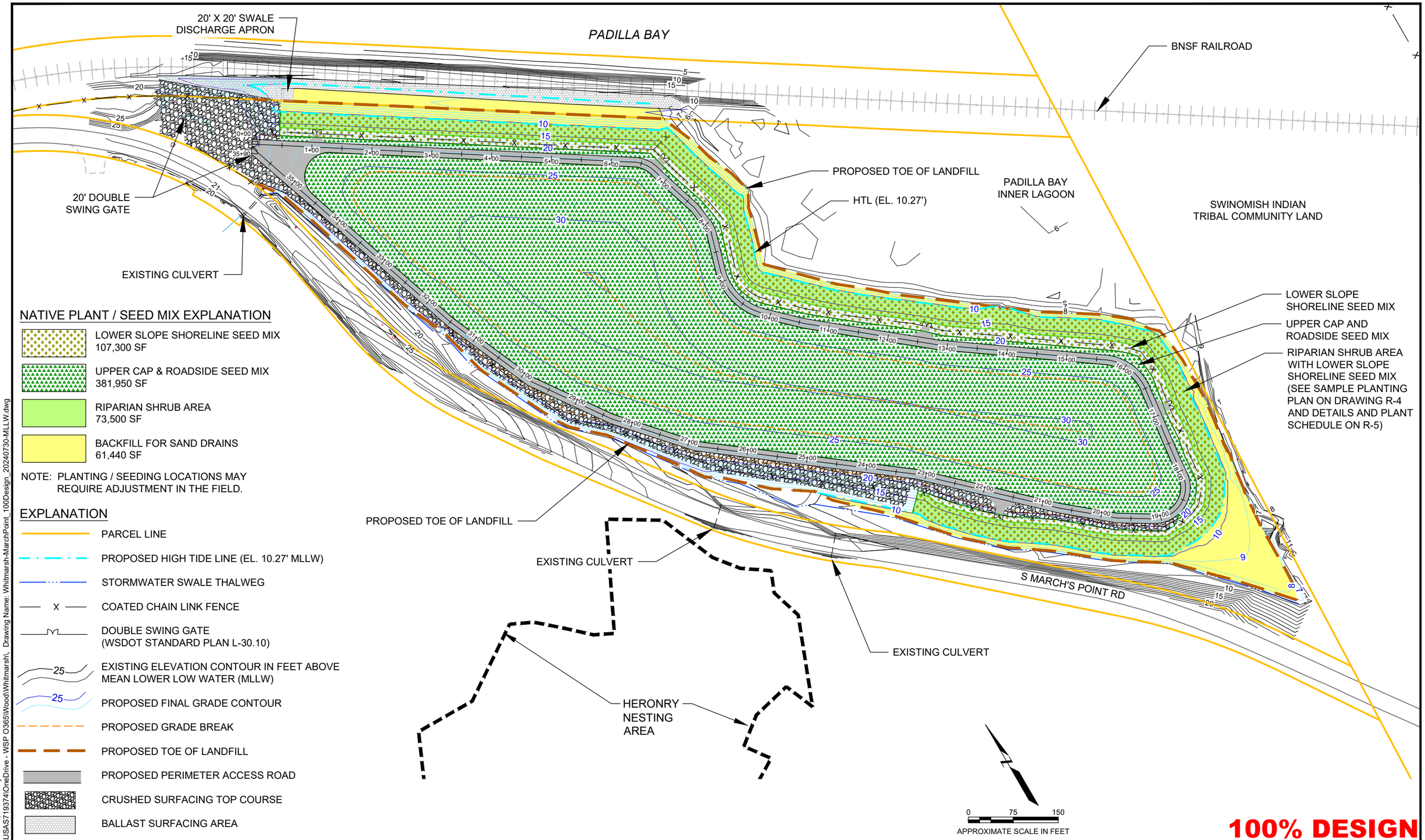
KOORUS TAHGHIGHI STATE OF WASHINGTON 32240 REGISTERED PROFESSIONAL ENGINEER

DETAILS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING C-14

Plot Date: 07/30/24 - 11:33am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



NATIVE PLANT / SEED MIX EXPLANATION

- LOWER SLOPE SHORELINE SEED MIX
  107,300 SF
- UPPER CAP & ROADSIDE SEED MIX
  381,950 SF
- RIPARIAN SHRUB AREA
  73,500 SF
- BACKFILL FOR SAND DRAINS
  61,440 SF

NOTE: PLANTING / SEEDING LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- X — COATED CHAIN LINK FENCE
- DOUBLE SWING GATE
  (WSDOT STANDARD PLAN L-30.10)
- 25 — EXISTING ELEVATION CONTOUR IN FEET ABOVE MEAN LOWER LOW WATER (MLLW)
- 25 — PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA

100% DESIGN

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.
VERTICAL DATUM: MLLW FT.

NO.	REVISION	DATE	APRVD
1			

DRAWN AS
DESIGNED KT
CHECKED KT
REVIEWED KT

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Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

SITE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

DRAWING
R-1

Plot Date: 07/30/24 - 11:33am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg

20' X 20' SWALE
DISCHARGE APRON

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

BNSF RAILROAD

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

PROPOSED TOE OF LANDFILL

HTL (EL. 10.27')

SWINOMISH INDIAN
TRIBAL COMMUNITY LAND

SEE SAMPLE PLANTING PLAN
SHOWN AT THIS AREA ON DRAWING R-4

PADILLA BAY
INNER LAGOON

14' DOUBLE SWING GATE
(WSDOT STANDARD PLAN L-30.10)

LOWER SLOPE
SHORELINE SEED MIX

UPPER CAP AND
ROADSIDE SEED MIX

RIPARIAN SHRUB AREA
WITH LOWER SLOPE
SHORELINE SEED MIX
(SEE SAMPLE PLANTING
PLAN ON DRAWING R-4
AND DETAILS AND PLANT
SCHEDULE ON R-5)

0.3%
25%
10%
6.5%
20%
EL. 25.6-19.6
EL. 35.3-25.6
EL. 30-25.6

S MARCH'S POINT RD

SEE DRAWING R-3

EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- COATED CHAIN LINK FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TOE OF LANDFILL
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- BACKFILL FOR SAND DRAINS
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA

0 50 100
APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM:
WASP NAD83 NORTH USFT.
VERTICAL DATUM:
MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

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Environment & Infrastructure Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

KORUS TAIGHI LEE
STATE OF WASHINGTON
32240
REGISTERED
PROFESSIONAL ENGINEER

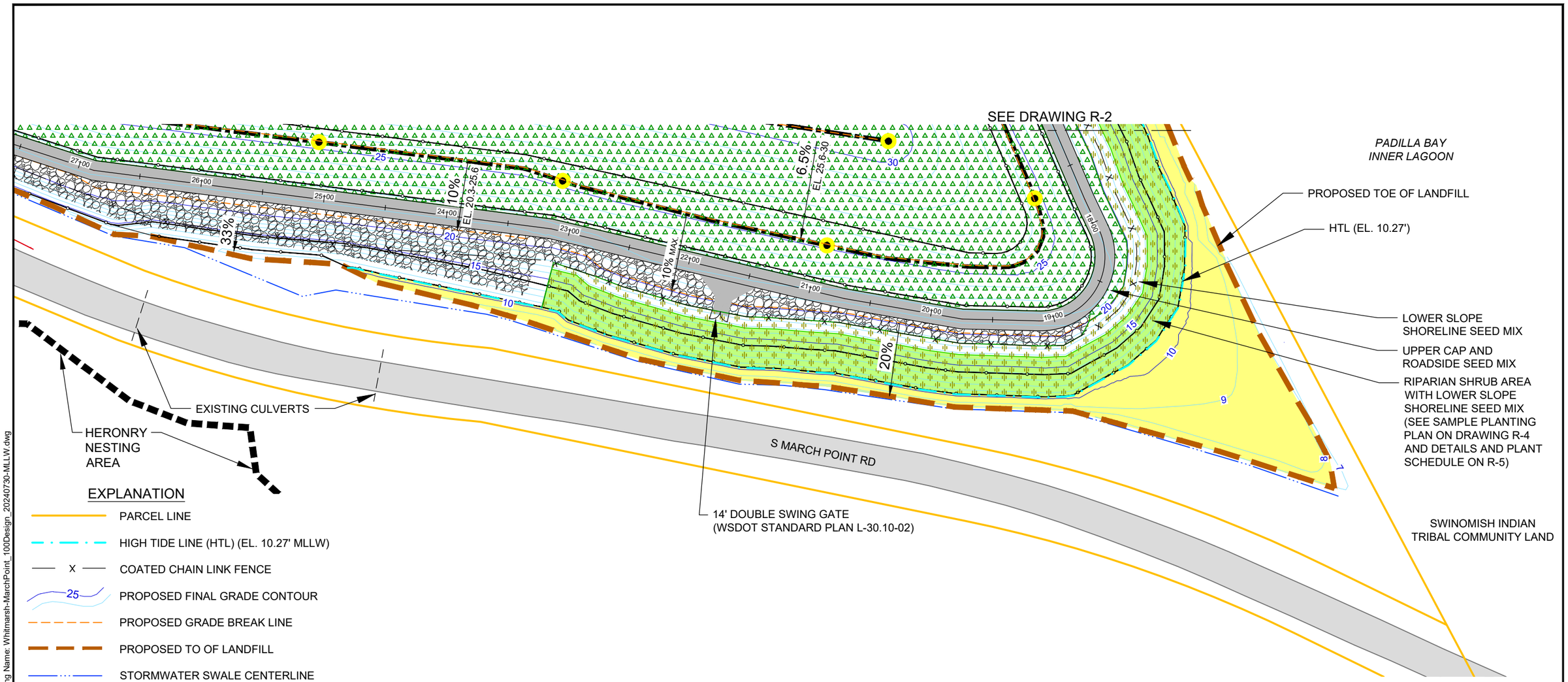
PLANTING PLAN
ALONG PADILLA BAY INNER LAGOON

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

DRAWING
R-2

Plot Date: 07/30/24 - 11:34am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh_Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



EXPLANATION

- PARCEL LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- COATED CHAIN LINK FENCE
- PROPOSED FINAL GRADE CONTOUR
- PROPOSED GRADE BREAK LINE
- PROPOSED TO OF LANDFILL
- STORMWATER SWALE CENTERLINE
- LOWER SLOPE SHORELINE SEED MIX
- UPPER CAP & ROADSIDE SEED MIX
- RIPARIAN SHRUB AREA
- BACKFILL FOR SAND DRAINS
- PROPOSED COMPOST BERM
- PROPOSED SUBSURFACE LANDFILL GAS PIPE AND SURFACE VENT LOCATION
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM HORIZONTAL DATUM: WASP NAD83 NORTH USFT. VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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18300 Redmond Way, Suite 200
Redmond, Washington 98052

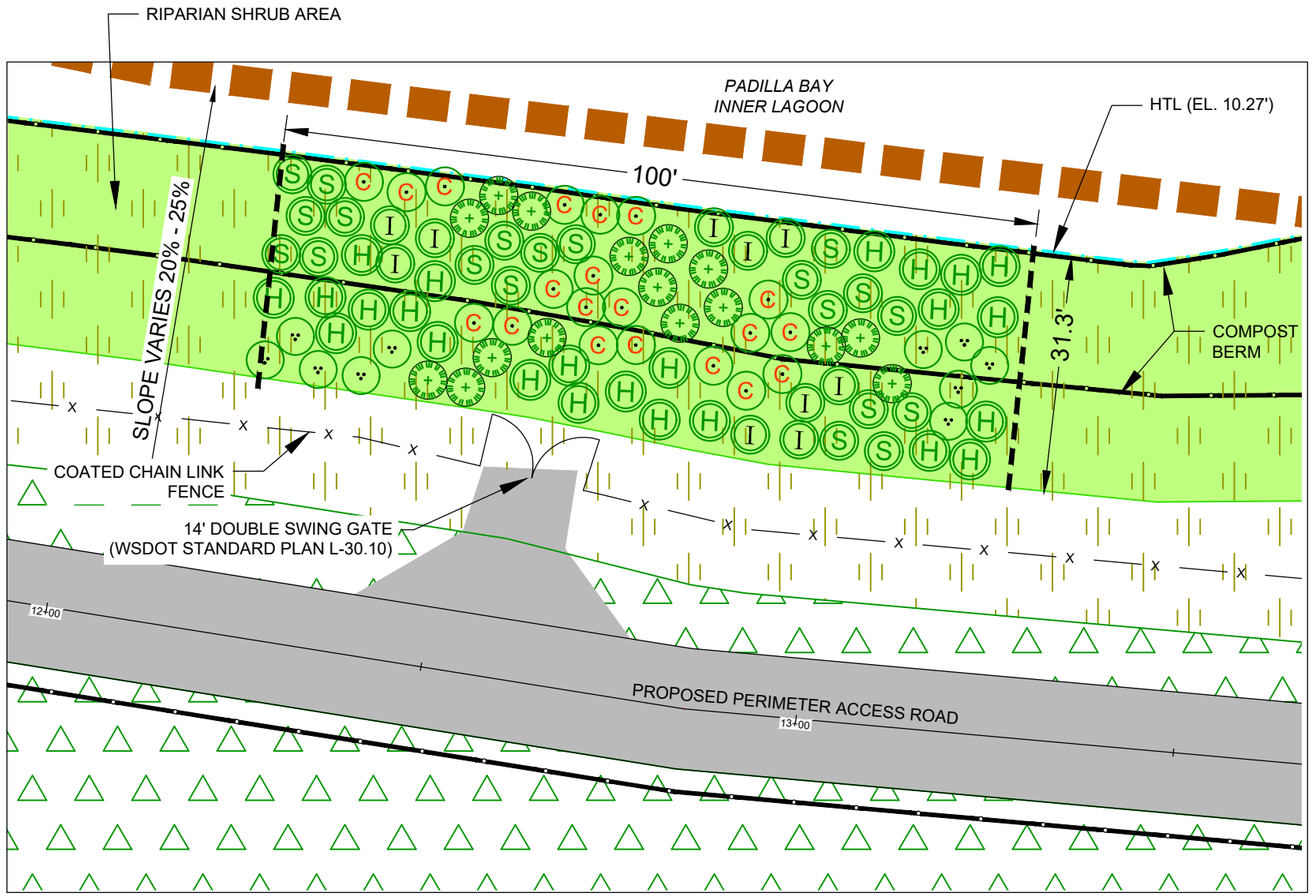
PLANTING PLAN
ALONG SOUTHERN DITCH

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

DRAWING
R-3

Plot Date: 07/30/24 - 11:34am Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\ Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



1 SHORELINE RESTORATION - RIPARIAN SHRUB AREA

3,130 SF SAMPLE PLANTING PLAN (100' X 31.3')

RIPARIAN SHRUB AREA PLANT SYMBOL EXPLANATION

	SHRUBS	QUANTITIES
⁘	*AMELANCHIER ALNIFOLIA* SERVICEBERRY	*10*
+	*GAULTHERIA SHALLON* SALAL	*16*
I	*HOLODISCUS DISCOLOR* OCEANSPRAY	*10*
C	*RIBES SANGUINEUM* RED FLOWERING CURRANT	*20*
S	*SYMPHORICARPOS ALBUS* SNOWBERRY	*20*
H	*VACCINIUM OVATUM* EVERGREEN HUCKLEBERRY	*24*

100 TOTAL
(FOR 3,130 SF AREA)

SEED MIXES

LOWER SLOPE SHORELINE SEED MIX

UPPER CAP AND ROADSIDE SEED MIX

NOTES:
1. SEE DETAILS AND PLANT SCHEDULE ON DRAWING R-5 FOR SPECIES, SIZE AND SPACING INFORMATION.
2. PLANTING DENSITY AND LOCATIONS MAY REQUIRE ADJUSTMENT IN THE FIELD.

0 10 20
APPROXIMATE SCALE IN FEET

100% DESIGN

REFERENCES:
PLANS

DATUM
HORIZONTAL DATUM:
WASP NAD83 NORTH USFT.
VERTICAL DATUM:
MLLW FT.

NO.	REVISION	DATE	APRVD

DRAWN APS
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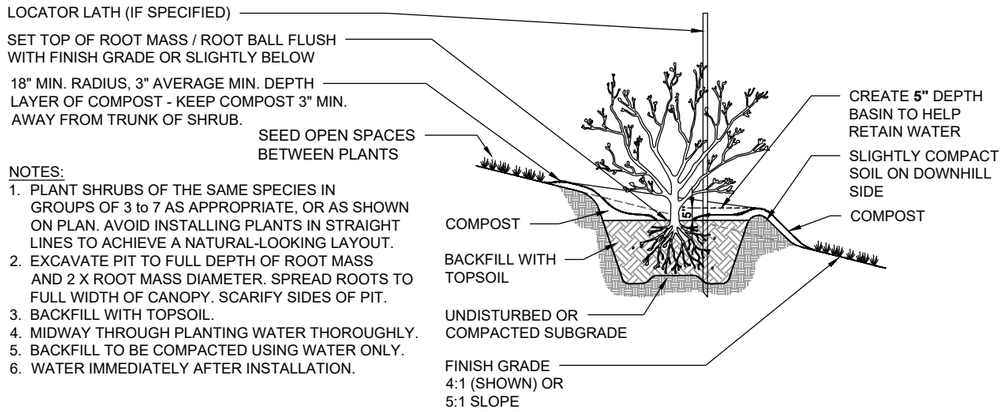
SAMPLE PLANTING PLAN

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410

DRAWING
R-4

Plot Date: 07/30/24 - 11:34am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



NOTES:
1. PLANT SHRUBS OF THE SAME SPECIES IN GROUPS OF 3 to 7 AS APPROPRIATE, OR AS SHOWN ON PLAN. AVOID INSTALLING PLANTS IN STRAIGHT LINES TO ACHIEVE A NATURAL-LOOKING LAYOUT.
2. EXCAVATE PIT TO FULL DEPTH OF ROOT MASS AND 2 X ROOT MASS DIAMETER. SPREAD ROOTS TO FULL WIDTH OF CANOPY. SCARIFY SIDES OF PIT.
3. BACKFILL WITH TOPSOIL.
4. MIDWAY THROUGH PLANTING WATER THOROUGHLY.
5. BACKFILL TO BE COMPACTED USING WATER ONLY.
6. WATER IMMEDIATELY AFTER INSTALLATION.

1 SHRUB PLANTING ON SLOPE

NOT TO SCALE

NATIVE PLANT SCHEDULE

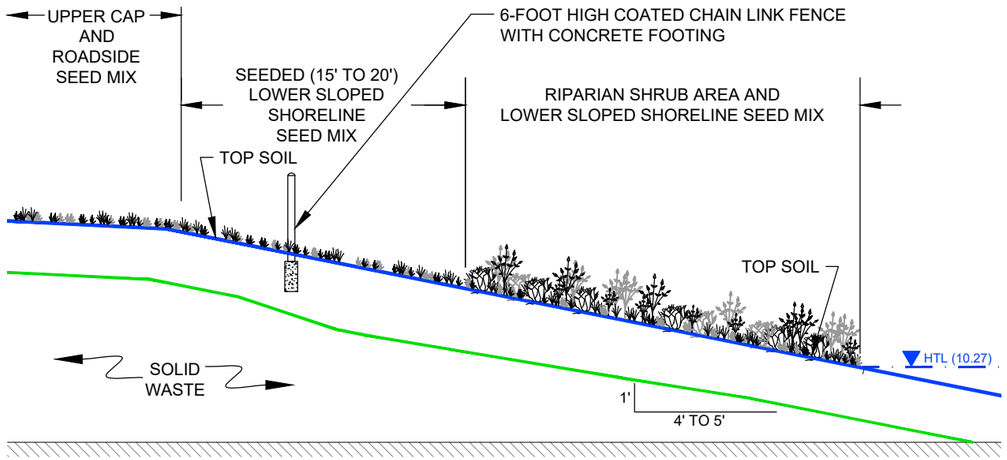
Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS	Spacing	Size	Condition	Planting Area
Shrubs - Lower Slope Shoreline			SF Area:	51,874	21,626	73,500				
			Acres	1.19	0.50	1.69				
Amelanchier alnifolia	Serviceberry		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry to Moist
Gaultheria shallon	Salal		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry - Upland
Holodiscus discolor	Oceanspray		FACU	200	83	283	6 ft o.c.	1 gal.	Container	Dry - Upland
Ribes sanguineum	Red-flowering currant		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Moist to Wet
Symphoricarpos albus	Snowberry		FACU	283	118	401	6 ft o.c.	1 gal.	Container	Dry to Moist
Vaccinium ovatum	Evergreen huckleberry		FACU	416	175	591	6 ft o.c	1 gal.	Container	Dry to Moist
Total			**Quan:**	**1,665**	**695**	**2360**				

Plant Name *Scientific*	Common		USDA Plant Wetland Status	LAGOON PLANTING AREA	DITCH PLANTING AREA	TOTALS
Seed Mix - Lower Slope Shoreline (applied at 10 lbs. per acre)			SF Area:	78,520	28,780	107,300
		%	Acres	1.80	0.66	2.46
Agrostis stolonifera	Creeping bentgrass	15%	FAC	2.7	1.0	3.7
Aster subspicatus	Douglas aster	5%	NR	0.9	0.3	1.2
Atriplex patula	Saltweed	10%	FACW	1.8	0.7	2.5
Elymus mollis	Dunegrass	15%	NR	2.7	1.0	3.7
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.9	0.3	1.2
Grindelia integrifolia	Pacific gumweed	10%	FACW	1.8	0.7	2.5
Hordeum brachyantherum	Meadow barley	30%	FACW	5.4	2.0	7.4
Lathyrus japonicus	Beach pea	10%	FACU	1.8	0.7	2.5
Total		*100%*	**Pounds:**	**18.0**	**6.6**	**24.6**

Plant Name *Scientific*	Common		USDA Plant Wetland Status	AREA BETWEEN ROAD AND SLOPED PERIMETER	AREA WITHIN ROADWAY	TOTALS
Seed Mix - Upper Cap and Roadside (applied at 18 lbs. per acre)			SF Area:	15,192	366,758	381,950
		%	Acres	0.35	8.42	8.77
Deschampsia cespitosa	Tufted hairgrass	20%	FACW	1.3	30.3	31.6
Elymus glaucus	Blue wildrye	20%	FACU	1.3	30.3	31.6
Festuca rubra	Creeping red fescue	10%	FAC	0.6	15.2	15.8
Fragaria chiloensis	Coastal strawberry	5%	FACU	0.3	7.6	7.9
Hordeum brachyantherum	Meadow barley	40%	FACW	2.5	60.6	63.1
Lupinus littoralis / rivulairs	Coastal lupine	5%	FAC	0.3	7.6	7.9
Total		*100%*	**Pounds:**	**6.3**	**151.6**	**157.8**

Notes:
1 - Scientific names and species identification taken from *Flora of the Pacific Northwest, 2nd Edition (Hitchcock and Cronquist, Ed. by Giblin, Ledger, Zika, and Olmstead, 2018).*
2 - Over-sized and/or container plants are suitable for replacement pending project engineer's or landscape architect's approval.
3 - Native plant species may be substituted or added with project engineer's or landscape architect's approval. Preference for substitutions is to select plant that shares the same USDA Plant Wetland Status Rating (see column 3 - USDA Plant Wetland Status).
4 - Planting density and locations may require adjustment in the field.

DEFINITION OF ACRONYMS:
USDA – United States Department of Agriculture
FACW (Facultative Wetland Plants)—Usually occur in wetlands, but may occur in non-wetlands.
FAC (Facultative Plants)—Occur in wetlands and non-wetlands.
FACU (Facultative Upland Plants)—Usually occur in non-wetlands, but may occur in wetlands.



2 PLANTING DETAIL ALONG INNER LAGOON

NOT TO SCALE

CROSS SECTION EXPLANATION
PROPOSED FINAL GRADE
PROPOSED TOP OF REFUSE

3 NATIVE PLANT SCHEDULE

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

SKAGIT COUNTY WASHINGTON

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Redmond, Washington 98052

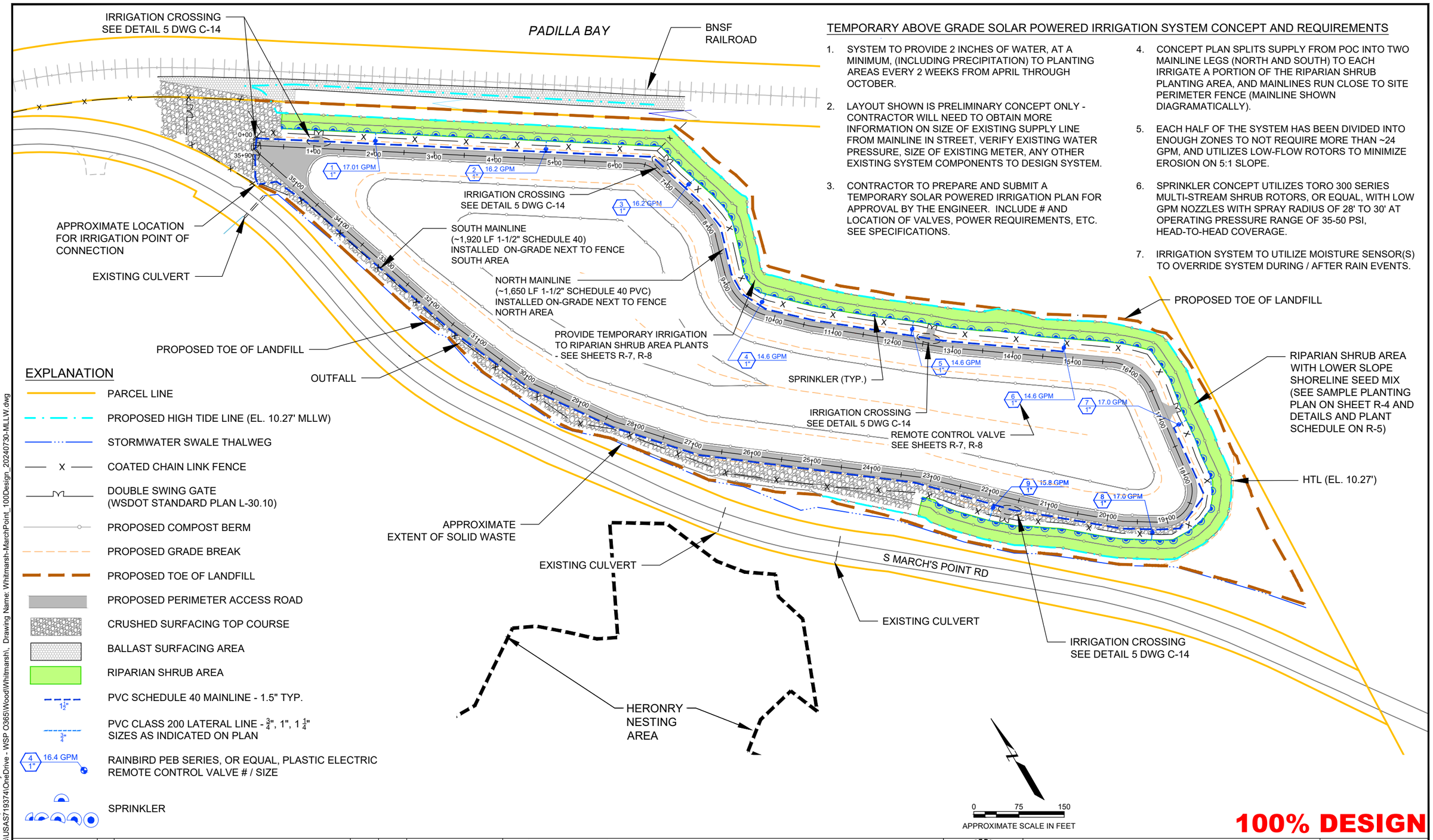
KOORUS TAHGHIGHI — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

PLANTING DETAILS AND NATIVE PLANT SCHEDULE

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING R-5

Plot Date: 07/30/24 - 11:34am, Plotted by: USAS719374
Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg



TEMPORARY ABOVE GRADE SOLAR POWERED IRRIGATION SYSTEM CONCEPT AND REQUIREMENTS

1. SYSTEM TO PROVIDE 2 INCHES OF WATER, AT A MINIMUM, (INCLUDING PRECIPITATION) TO PLANTING AREAS EVERY 2 WEEKS FROM APRIL THROUGH OCTOBER.
2. LAYOUT SHOWN IS PRELIMINARY CONCEPT ONLY - CONTRACTOR WILL NEED TO OBTAIN MORE INFORMATION ON SIZE OF EXISTING SUPPLY LINE FROM MAINLINE IN STREET, VERIFY EXISTING WATER PRESSURE, SIZE OF EXISTING METER, ANY OTHER EXISTING SYSTEM COMPONENTS TO DESIGN SYSTEM.
3. CONTRACTOR TO PREPARE AND SUBMIT A TEMPORARY SOLAR POWERED IRRIGATION PLAN FOR APPROVAL BY THE ENGINEER. INCLUDE # AND LOCATION OF VALVES, POWER REQUIREMENTS, ETC. SEE SPECIFICATIONS.
4. CONCEPT PLAN SPLITS SUPPLY FROM POC INTO TWO MAINLINE LEGS (NORTH AND SOUTH) TO EACH IRRIGATE A PORTION OF THE RIPARIAN SHRUB PLANTING AREA, AND MAINLINES RUN CLOSE TO SITE PERIMETER FENCE (MAINLINE SHOWN DIAGRAMATICALLY).
5. EACH HALF OF THE SYSTEM HAS BEEN DIVIDED INTO ENOUGH ZONES TO NOT REQUIRE MORE THAN ~24 GPM, AND UTILIZES LOW-FLOW ROTORS TO MINIMIZE EROSION ON 5:1 SLOPE.
6. SPRINKLER CONCEPT UTILIZES TORO 300 SERIES MULTI-STREAM SHRUB ROTORS, OR EQUAL, WITH LOW GPM NOZZLES WITH SPRAY RADIUS OF 28' TO 30' AT OPERATING PRESSURE RANGE OF 35-50 PSI, HEAD-TO-HEAD COVERAGE.
7. IRRIGATION SYSTEM TO UTILIZE MOISTURE SENSOR(S) TO OVERRIDE SYSTEM DURING / AFTER RAIN EVENTS.

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED COMPOST BERM
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- PVC CLASS 200 LATERAL LINE - $\frac{3}{4}$", 1", 1 $\frac{1}{4}$" SIZES AS INDICATED ON PLAN
- 4 1" 16.4 GPM — RAINBIRD PEB SERIES, OR EQUAL, PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- SPRINKLER

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				
	1			

DRAWN AS | DESIGNED KT | CHECKED KT | REVIEWED KT

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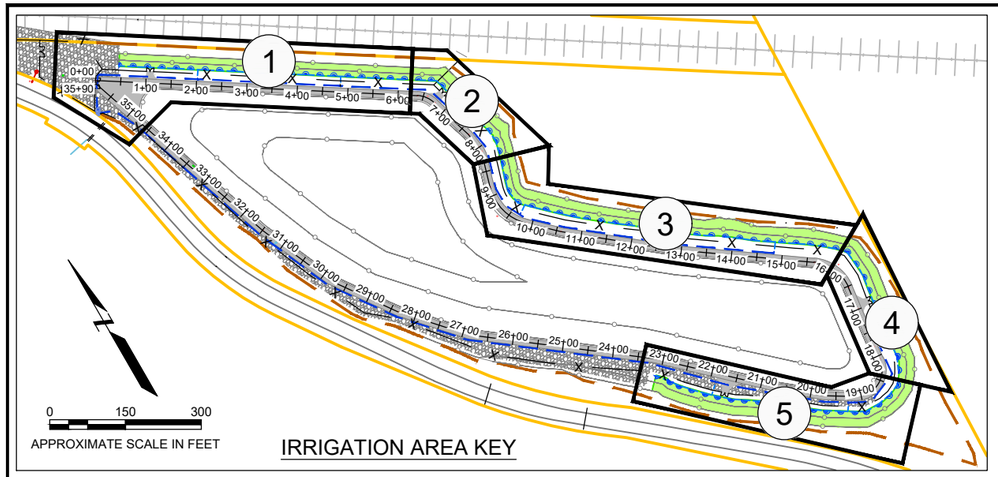
KYORUS TAIGH LIGHT — STATE OF WASHINGTON — 32240 — REGISTERED PROFESSIONAL ENGINEER

TEMPORARY IRRIGATION CONCEPT PLAN

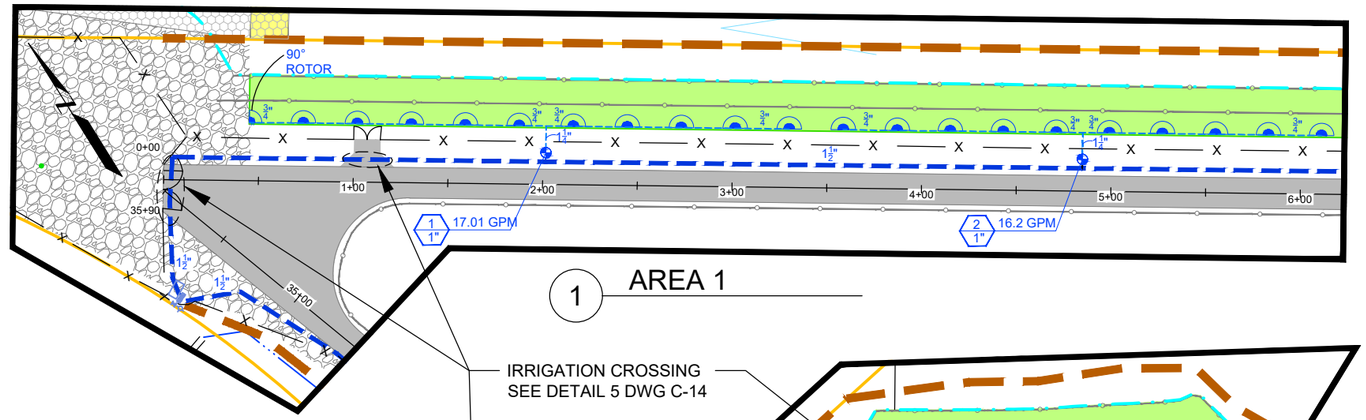
MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

DATE: 07/30/24
PROJECT NO.: PS21204410
DRAWING R-6

Plot Date: 07/30/24 - 11:35am, Plotted by: USAS719374
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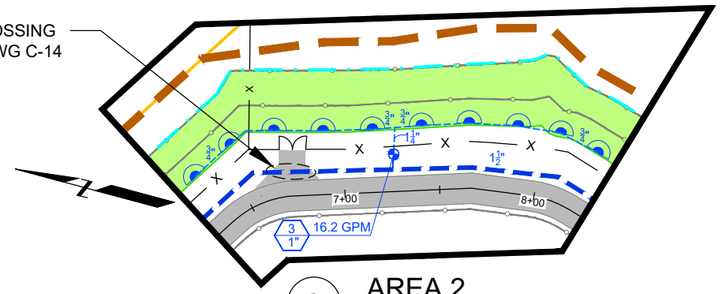


IRRIGATION AREA KEY

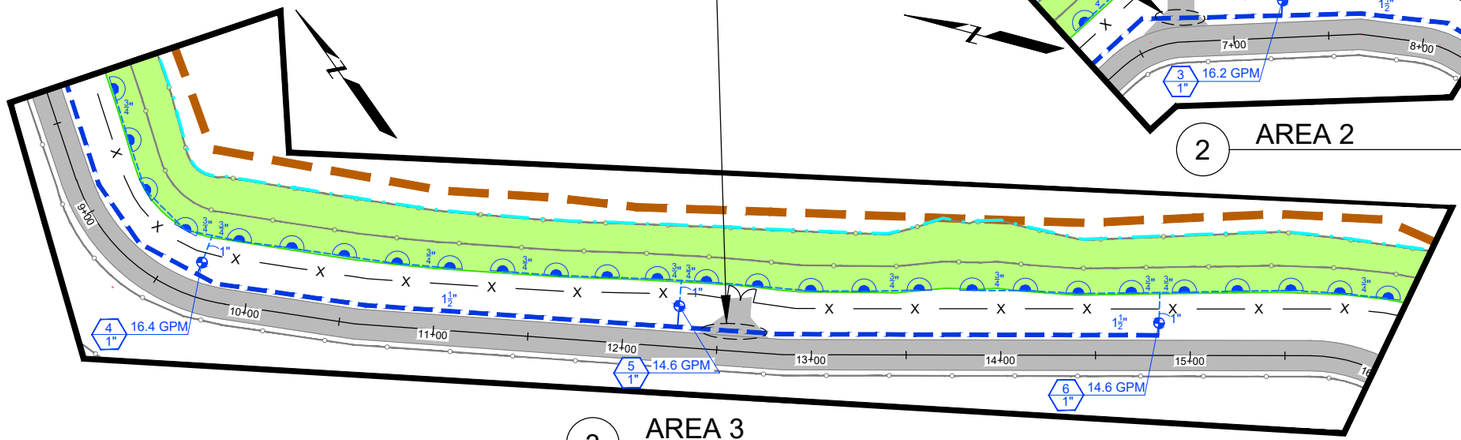


1 AREA 1

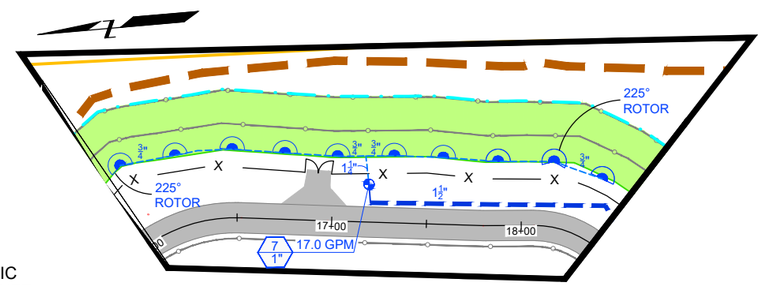
IRRIGATION CROSSING
SEE DETAIL 5 DWG C-14



2 AREA 2

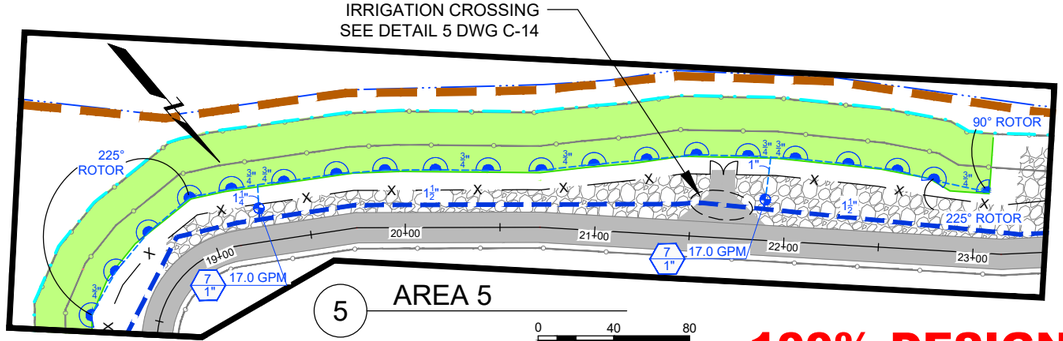


3 AREA 3



4 AREA 4

IRRIGATION CROSSING
SEE DETAIL 5 DWG C-14



5 AREA 5

0 40 80
APPROXIMATE SCALE IN FEET

EXPLANATION

- PARCEL LINE
- PROPOSED HIGH TIDE LINE (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE (WSDOT STANDARD PLAN L-30.10)
- PROPOSED COMPOST BERM
- PROPOSED TOE OF LANDFILL
- PROPOSED PERIMETER ACCESS ROAD
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- 1½" PVC SCHEDULE 40 MAINLINE - 1.5" TYP.
- ¾" PVC CLASS 200 LATERAL LINE - ¾", 1", 1 ¼" SIZES AS INDICATED ON PLAN
- 4 1" 16.4 GPM RAINBIRD PEB SERIES, OR EQUAL, PLASTIC ELECTRIC REMOTE CONTROL VALVE # / SIZE
- SPRINKLER

100% DESIGN

REFERENCES:	NO.	REVISION	DATE	APRVD
PLANS				
DATUM				
HORIZONTAL DATUM: WASP NAD83 NORTH USFT.				
VERTICAL DATUM: MLLW FT.				

DRAWN APS
DESIGNED KT
CHECKED KT
REVIEWED KT

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Redmond, Washington 98052

TEMPORARY IRRIGATION CONCEPT AREAS

MARCH POINT (WHITMARSH) LANDFILL
SKAGIT COUNTY, WASHINGTON

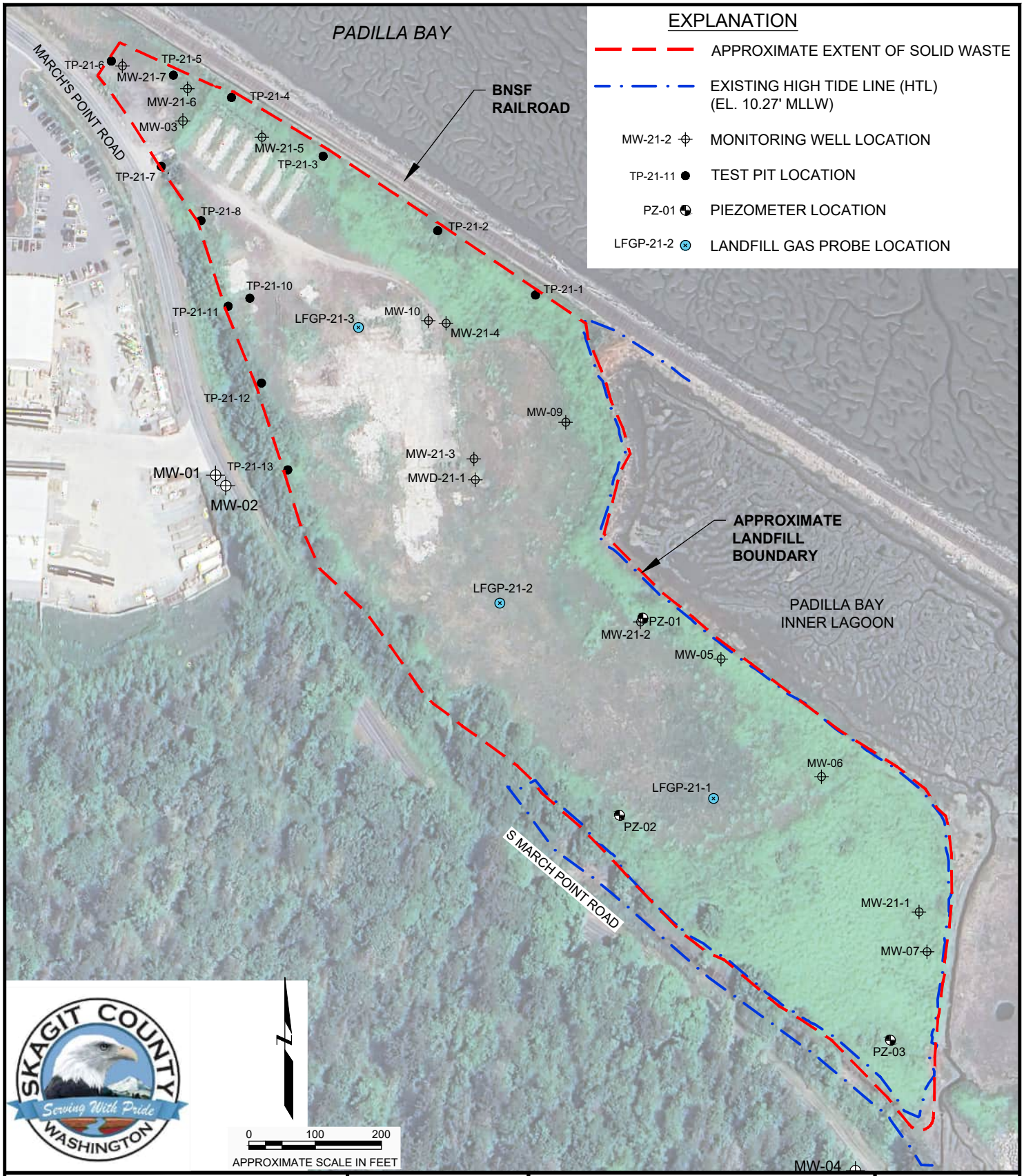
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PROJECT NO.: PS21204410

DRAWING R-7

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Drawing Path: C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\, Drawing Name: Whitmarsh-MarchPoint_100Design_20240730-MLLW.dwg

Appendix B

Analytical Testing Information



SKAGIT COUNTY

WSP USA
Environment & Infrastructure Inc.
4020 Lake Washington Blvd NE, Suite 200
Redmond, Washington 98052

PROJECT
MARCH POINT (WHITMARSH) LANDFILL

TITLE
EXPLORATION LOCATIONS

DATE
OCTOBER 2023

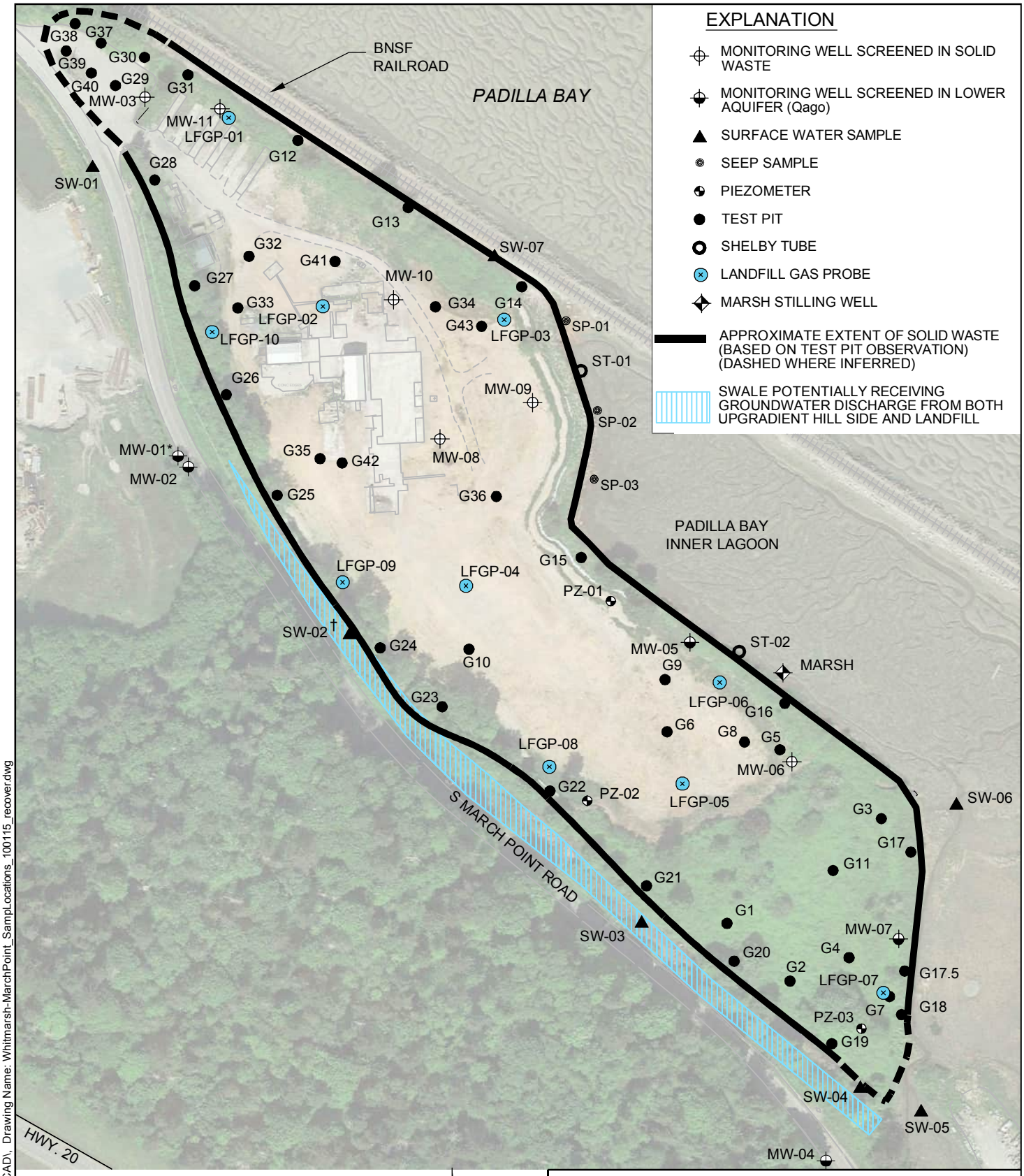
SCALE
AS SHOWN

PROJECT NO.
PS21204410

FIGURE
1

DRAWN BY: APS CHECKED BY: TLP

C:\Users\USAS719374\OneDrive - WSP O365\Wood\Whitmarsh\Whitmarsh-MarchPoint_DesignDRAFT_103023-MLLW.dwg - ExplorationPlan - Oct. 30, 2023 2:23pm - USAS719374



Aerial Photo Courtesy of Google Earth (May, 2015)

NOTES:

* No well was installed at MW-01 because no deeper aquifer was encountered at the time of drilling.

† SW-02 was dry during all sampling events and was therefore not sampled.

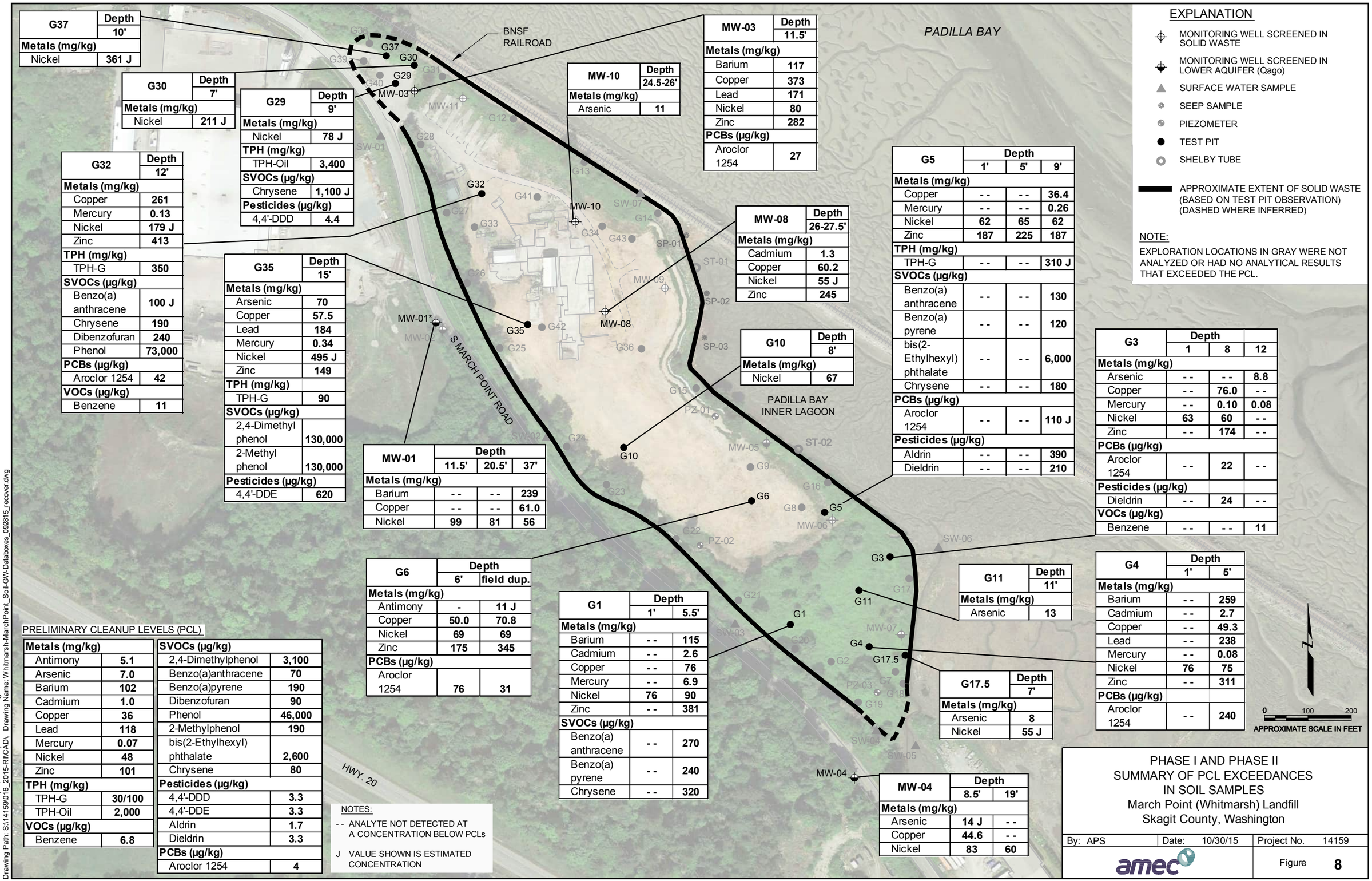
0 100 200

APPROXIMATE SCALE IN FEET

SURVEYED PHASE I AND PHASE II UPLAND SAMPLE LOCATIONS
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 10/02/15	Project No. 14159
amec		Figure 5

Plot Date: 10/02/15 - 12:40pm, Plotted by: adam.stenberg
Drawing Path: S:\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_100115_recover.dwg



G37	Depth
	10'
Metals (mg/kg)	
Nickel	**361 J**

G30	Depth
	7'
Metals (mg/kg)	
Nickel	**211 J**

G29	Depth
	9'
Metals (mg/kg)	
Nickel	**78 J**
TPH (mg/kg)	
TPH-Oil	**3,400**
SVOCs (µg/kg)	
Chrysene	**1,100 J**
Pesticides (µg/kg)	
4,4'-DDD	**4.4**

MW-10	Depth
	24.5-26'
Metals (mg/kg)	
Arsenic	**11**

MW-03	Depth
	11.5'
Metals (mg/kg)	
Barium	**117**
Copper	**373**
Lead	**171**
Nickel	**80**
Zinc	**282**
PCBs (µg/kg)	
Aroclor 1254	**27**

G32	Depth
	12'
Metals (mg/kg)	
Copper	**261**
Mercury	**0.13**
Nickel	**179 J**
Zinc	**413**
TPH (mg/kg)	
TPH-G	**350**
SVOCs (µg/kg)	
Benzo(a) anthracene	**100 J**
Chrysene	**190**
Dibenzofuran	**240**
Phenol	**73,000**
PCBs (µg/kg)	
Aroclor 1254	**42**
VOCs (µg/kg)	
Benzene	**11**

G35	Depth
	15'
Metals (mg/kg)	
Arsenic	**70**
Copper	**57.5**
Lead	**184**
Mercury	**0.34**
Nickel	**495 J**
Zinc	**149**
TPH (mg/kg)	
TPH-G	**90**
SVOCs (µg/kg)	
2,4-Dimethyl phenol	**130,000**
2-Methyl phenol	**130,000**
Pesticides (µg/kg)	
4,4'-DDE	**620**

MW-08	Depth
	26-27.5'
Metals (mg/kg)	
Cadmium	**1.3**
Copper	**60.2**
Nickel	**55 J**
Zinc	**245**

G10	Depth
	8'
Metals (mg/kg)	
Nickel	**67**

G5	Depth		
	1'	5'	9'
Metals (mg/kg)			
Copper	- -	- -	**36.4**
Mercury	- -	- -	**0.26**
Nickel	**62**	**65**	**62**
Zinc	**187**	**225**	**187**
TPH (mg/kg)			
TPH-G	- -	- -	**310 J**
SVOCs (µg/kg)			
Benzo(a) anthracene	- -	- -	**130**
Benzo(a) pyrene	- -	- -	**120**
bis(2-Ethylhexyl) phthalate	- -	- -	**6,000**
Chrysene	- -	- -	**180**
PCBs (µg/kg)			
Aroclor 1254	- -	- -	**110 J**
Pesticides (µg/kg)			
Aldrin	- -	- -	**390**
Dieldrin	- -	- -	**210**

G3	Depth		
	1	8	12
Metals (mg/kg)			
Arsenic	- -	- -	**8.8**
Copper	- -	**76.0**	- -
Mercury	- -	**0.10**	**0.08**
Nickel	**63**	**60**	- -
Zinc	- -	**174**	- -
PCBs (µg/kg)			
Aroclor 1254	- -	**22**	- -
Pesticides (µg/kg)			
Dieldrin	- -	**24**	- -
VOCs (µg/kg)			
Benzene	- -	- -	**11**

MW-01	Depth		
	11.5'	20.5'	37'
Metals (mg/kg)			
Barium	- -	- -	**239**
Copper	- -	- -	**61.0**
Nickel	**99**	**81**	**56**

G6	Depth	
	6'	field dup.
Metals (mg/kg)		
Antimony	-	**11 J**
Copper	**50.0**	**70.8**
Nickel	**69**	**69**
Zinc	**175**	**345**
PCBs (µg/kg)		
Aroclor 1254	**76**	**31**

G1	Depth	
	1'	5.5'
Metals (mg/kg)		
Barium	- -	**115**
Cadmium	- -	**2.6**
Copper	- -	**76**
Mercury	- -	**6.9**
Nickel	**76**	**90**
Zinc	- -	**381**
SVOCs (µg/kg)		
Benzo(a) anthracene	- -	**270**
Benzo(a) pyrene	- -	**240**
Chrysene	- -	**320**

G11	Depth
	11'
Metals (mg/kg)	
Arsenic	**13**

G4	Depth	
	1'	5'
Metals (mg/kg)		
Barium	- -	**259**
Cadmium	- -	**2.7**
Copper	- -	**49.3**
Lead	- -	**238**
Mercury	- -	**0.08**
Nickel	**76**	**75**
Zinc	- -	**311**
PCBs (µg/kg)		
Aroclor 1254	- -	**240**

G17.5	Depth
	7'
Metals (mg/kg)	
Arsenic	**8**
Nickel	**55 J**

MW-04	Depth	
	8.5'	19'
Metals (mg/kg)		
Arsenic	**14 J**	- -
Copper	**44.6**	- -
Nickel	**83**	**60**

PRELIMINARY CLEANUP LEVELS (PCL)

Metals (mg/kg)	
Antimony	**5.1**
Arsenic	**7.0**
Barium	**102**
Cadmium	**1.0**
Copper	**36**
Lead	**118**
Mercury	**0.07**
Nickel	**48**
Zinc	**101**
TPH (mg/kg)	
TPH-G	**30/100**
TPH-Oil	**2,000**
VOCs (µg/kg)	
Benzene	**6.8**

SVOCs (µg/kg)	
2,4-Dimethylphenol	**3,100**
Benzo(a)anthracene	**70**
Benzo(a)pyrene	**190**
Dibenzofuran	**90**
Phenol	**46,000**
2-Methylphenol	**190**
bis(2-Ethylhexyl) phthalate	**2,600**
Chrysene	**80**
Pesticides (µg/kg)	
4,4'-DDD	**3.3**
4,4'-DDE	**3.3**
Aldrin	**1.7**
Dieldrin	**3.3**
PCBs (µg/kg)	
Aroclor 1254	**4**

NOTES:

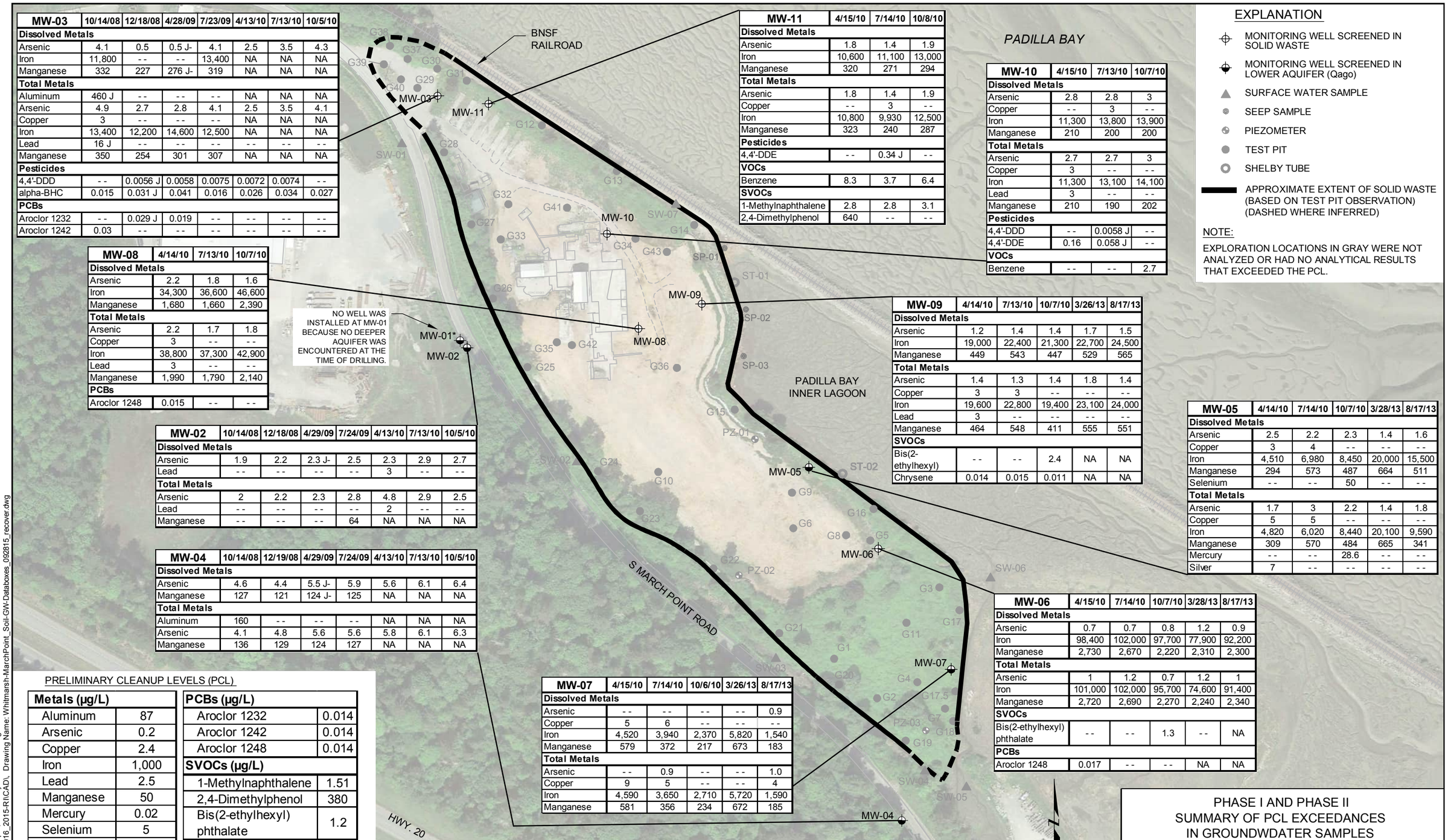
- - ANALYTE NOT DETECTED AT A CONCENTRATION BELOW PCLs

J VALUE SHOWN IS ESTIMATED CONCENTRATION

PHASE I AND PHASE II
SUMMARY OF PCL EXCEEDANCES
IN SOIL SAMPLES
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 10/30/15	Project No. 14159
amec		Figure 8

Plot Date: 10/30/15 - 1:26pm, Plotted by: adam.sterberg
Drawing Path: S:\14159\016_2015-R\CAD\, Drawing Name: Whitmarsh-MarchPoint_Soil-GW-Databoxes_092815_recover.dwg



MW-03	10/14/08	12/18/08	4/28/09	7/23/09	4/13/10	7/13/10	10/5/10
Dissolved Metals							
Arsenic	4.1	0.5	0.5 J-	4.1	2.5	3.5	4.3
Iron	11,800	- -	- -	13,400	NA	NA	NA
Manganese	332	227	276 J-	319	NA	NA	NA
Total Metals							
Aluminum	460 J	- -	- -	- -	NA	NA	NA
Arsenic	4.9	2.7	2.8	4.1	2.5	3.5	4.1
Copper	3	- -	- -	- -	NA	NA	NA
Iron	13,400	12,200	14,600	12,500	NA	NA	NA
Lead	16 J	- -	- -	- -	- -	- -	- -
Manganese	350	254	301	307	NA	NA	NA
Pesticides							
4,4'-DDD	- -	0.0056 J	0.0058	0.0075	0.0072	0.0074	- -
alpha-BHC	0.015	0.031 J	0.041	0.016	0.026	0.034	0.027
PCBs							
Aroclor 1232	- -	0.029 J	0.019	- -	- -	- -	- -
Aroclor 1242	0.03	- -	- -	- -	- -	- -	- -

MW-11	4/15/10	7/14/10	10/8/10
Dissolved Metals			
Arsenic	1.8	1.4	1.9
Iron	10,600	11,100	13,000
Manganese	320	271	294
Total Metals			
Arsenic	1.8	1.4	1.9
Copper	- -	3	- -
Iron	10,800	9,930	12,500
Manganese	323	240	287
Pesticides			
4,4'-DDE	- -	0.34 J	- -
VOCs			
Benzene	8.3	3.7	6.4
SVOCs			
1-Methylnaphthalene	2.8	2.8	3.1
2,4-Dimethylphenol	640	- -	- -

MW-10	4/15/10	7/13/10	10/7/10
Dissolved Metals			
Arsenic	2.8	2.8	3
Copper	- -	3	- -
Iron	11,300	13,800	13,900
Manganese	210	200	200
Total Metals			
Arsenic	2.7	2.7	3
Copper	3	- -	- -
Iron	11,300	13,100	14,100
Lead	3	- -	- -
Manganese	210	190	202
Pesticides			
4,4'-DDD	- -	0.0058 J	- -
4,4'-DDE	0.16	0.058 J	- -
VOCs			
Benzene	- -	- -	2.7

MW-08	4/14/10	7/13/10	10/7/10
Dissolved Metals			
Arsenic	2.2	1.8	1.6
Iron	34,300	36,600	46,600
Manganese	1,680	1,660	2,390
Total Metals			
Arsenic	2.2	1.7	1.8
Copper	3	- -	- -
Iron	38,800	37,300	42,900
Lead	3	- -	- -
Manganese	1,990	1,790	2,140
PCBs			
Aroclor 1248	0.015	- -	- -

MW-09	4/14/10	7/13/10	10/7/10	3/26/13	8/17/13
Dissolved Metals					
Arsenic	1.2	1.4	1.4	1.7	1.5
Iron	19,000	22,400	21,300	22,700	24,500
Manganese	449	543	447	529	565
Total Metals					
Arsenic	1.4	1.3	1.4	1.8	1.4
Copper	3	3	- -	- -	- -
Iron	19,600	22,800	19,400	23,100	24,000
Lead	3	- -	- -	- -	- -
Manganese	464	548	411	555	551
SVOCs					
Bis(2-ethylhexyl)	- -	- -	2.4	NA	NA
Chrysene	0.014	0.015	0.011	NA	NA

MW-05	4/14/10	7/14/10	10/7/10	3/28/13	8/17/13
Dissolved Metals					
Arsenic	2.5	2.2	2.3	1.4	1.6
Copper	3	4	- -	- -	- -
Iron	4,510	6,980	8,450	20,000	15,500
Manganese	294	573	487	664	511
Selenium	- -	- -	50	- -	- -
Total Metals					
Arsenic	1.7	3	2.2	1.4	1.8
Copper	5	5	- -	- -	- -
Iron	4,820	6,020	8,440	20,100	9,590
Manganese	309	570	484	665	341
Mercury	- -	- -	28.6	- -	- -
Silver	7	- -	- -	- -	- -

MW-02	10/14/08	12/18/08	4/29/09	7/24/09	4/13/10	7/13/10	10/5/10
Dissolved Metals							
Arsenic	1.9	2.2	2.3 J-	2.5	2.3	2.9	2.7
Lead	- -	- -	- -	- -	3	- -	- -
Total Metals							
Arsenic	2	2.2	2.3	2.8	4.8	2.9	2.5
Lead	- -	- -	- -	- -	2	- -	- -
Manganese	- -	- -	- -	64	NA	NA	NA

MW-04	10/14/08	12/19/08	4/29/09	7/24/09	4/13/10	7/13/10	10/5/10
Dissolved Metals							
Arsenic	4.6	4.4	5.5 J-	5.9	5.6	6.1	6.4
Manganese	127	121	124 J-	125	NA	NA	NA
Total Metals							
Aluminum	160	- -	- -	- -	NA	NA	NA
Arsenic	4.1	4.8	5.6	5.6	5.8	6.1	6.3
Manganese	136	129	124	127	NA	NA	NA

MW-06	4/15/10	7/14/10	10/7/10	3/28/13	8/17/13
Dissolved Metals					
Arsenic	0.7	0.7	0.8	1.2	0.9
Iron	98,400	102,000	97,700	77,900	92,200
Manganese	2,730	2,670	2,220	2,310	2,300
Total Metals					
Arsenic	1	1.2	0.7	1.2	1
Iron	101,000	102,000	95,700	74,600	91,400
Manganese	2,720	2,690	2,270	2,240	2,340
SVOCs					
Bis(2-ethylhexyl) phthalate	- -	- -	1.3	- -	NA
PCBs					
Aroclor 1248	0.017	- -	- -	NA	NA

MW-07	4/15/10	7/14/10	10/6/10	3/26/13	8/17/13
Dissolved Metals					
Arsenic	- -	- -	- -	- -	0.9
Copper	5	6	- -	- -	- -
Iron	4,520	3,940	2,370	5,820	1,540
Manganese	579	372	217	673	183
Total Metals					
Arsenic	- -	0.9	- -	- -	1.0
Copper	9	5	- -	- -	4
Iron	4,590	3,650	2,710	5,720	1,590
Manganese	581	356	234	672	185

EXPLANATION

- MONITORING WELL SCREENED IN SOLID WASTE
- MONITORING WELL SCREENED IN LOWER AQUIFER (Qago)
- SURFACE WATER SAMPLE
- SEEP SAMPLE
- PIEZOMETER
- TEST PIT
- SHELBY TUBE
- APPROXIMATE EXTENT OF SOLID WASTE (BASED ON TEST PIT OBSERVATION) (DASHED WHERE INFERRED)

NOTE:

EXPLORATION LOCATIONS IN GRAY WERE NOT ANALYZED OR HAD NO ANALYTICAL RESULTS THAT EXCEEDED THE PCL.

PRELIMINARY CLEANUP LEVELS (PCL)

Metals (µg/L)	
Aluminum	87
Arsenic	0.2
Copper	2.4
Iron	1,000
Lead	2.5
Manganese	50
Mercury	0.02
Selenium	5
Silver	1.9
Pesticides (µg/L)	
4,4'-DDD	0.00125
4,4'-DDE	0.00125
alpha-BHC	0.0006

PCBs (µg/L)	
Aroclor 1232	0.014
Aroclor 1242	0.014
Aroclor 1248	0.014
SVOCs (µg/L)	
1-Methylnaphthalene	1.51
2,4-Dimethylphenol	380
Bis(2-ethylhexyl) phthalate	1.2
Chrysene	0.01
VOCs (µg/L)	
Benzene	1.2

NOTE: ALUMINUM HAD A PCL BUT IS NOT A CONSTITUENT OF CONCERN.

NOTES:

NA NOT ANALYZED

- - ANALYTE NOT DETECTED AT A CONCENTRATION GREATER THAN PCLs

J VALUE SHOWN IS ESTIMATED CONCENTRATION

J- VALUE SHOWN IS ESTIMATED CONCENTRATION WITH A POSSIBLE LOW BIAS

PHASE I AND PHASE II SUMMARY OF PCL EXCEEDANCES IN GROUNDWDATER SAMPLES March Point (Whitmarsh) Landfill Skagit County, Washington

By: APS	Date: 10/30/15	Project No. 14159
amec		Figure 9

Plot Date: 10/30/15 - 1:34pm, Plotted by: adam.stenberg
Drawing Path: S:\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_Soil-GW-Databoxes_092815_recover.dwg

TABLE A-3: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]
March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Dissolved Metals (µg/L)																			
Arsenic	0.20	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	**3.5**	**3.7**	**3.5**	**7.3**	3.0 U	3.0 U
Barium	NA	**47**	**73**	**57**	**36**	**150**	**140**	**190**	**190**	25 U	25 U	**68**	**52**	25 U	25 U	25 U	25 U	25 U	**44**
Cadmium	NA	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Chromium	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	1,000	**430**	**4,800**	**62,000**	**32,000**	**800**	**2,200**	**540**	**620**	**4,400**	**2,700**	**570**	**930 J**	56 U	56 U	56 U	**330**	56 U	**540 J**
Lead	2.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Mercury	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	5.0	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Silver	1.9	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (µg/L)																			
Arsenic	0.20	3.3 U	**6.0**	3.3 U	3.3 U	3.3 U	3.3 U	**6.1**	3.3 U	**5.6**	3.3 U	**4.2**	3.3 U	**4.1**	**4.1**	**3.8**	**8.6**	3.3 U	3.3 U
Barium	NA	**83**	**110**	**96**	**93**	**250**	**250**	**270**	**290**	**64**	**31**	**150**	**120**	28 U	28 U	28 U	**29**	28 U	**130**
Cadmium	NA	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U	4.4 U
Chromium	NA	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	**12**	11 U	11 U
Iron	1,000	**12,000**	**17,000**	**85,000**	**79,000**	**20,000**	**22,000**	**17,000**	**14,000**	**16,000**	**9,000**	**17,000**	**17,000**	**900 J**	56 U	**630 J**	**4,600**	56 U	**16,000**
Lead	2.5	**6.5**	1.1 U	**2.8**	1.1 U	**5.0**	1.1 U	**9.4**	1.1 U	**42**	**2.1**	**16**	1.1 U	1.1 U	1.1 U	1.1 U	**1.4**	1.1 U	1.1 U
Mercury	0.20	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Selenium	NA	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U	5.6 U
Silver	1.9	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U	11 U
PCBs (µg/L)																			
PCB-aroclor 1016	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1221	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1232	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1242	0.014	0.050 U	0.053 U	**0.057**	**0.11**	0.051 U	0.050 U	0.25 UJ	5.6 UJ	0.96 UJ	4.9 UJ	0.25 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1248	0.014	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	5.0 UJ	5.6 UJ	4.8 UJ	4.9 UJ	5.0 UJ	5.2 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	5.3 UJ
PCB-aroclor 1254	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.25 UJ	0.56 UJ	0.96 UJ	0.49 UJ	0.25 UJ	0.52 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.53 UJ
PCB-aroclor 1260	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 UJ	0.056 U	0.048 UJ	0.049 U	0.050 UJ	0.052 UJ	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	0.053 U
Pesticides (µg/L)																			
4,4'-DDD	0.0013	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.59**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
4,4'-DDE	0.0013	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	**0.0073**	**0.23 J**	**0.20**	**0.70**	**0.49 J**	**0.32 J**	**0.67 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.68 J**
4,4'-DDT	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.01 J**	**0.014 J**	0.048 U	**0.38**	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.17 J**
Aldrin	NA	0.0020 U	0.0021 U	0.0020 U	0.0021 U	0.0020 U	0.0020 U	**0.33 J**	**0.43 J**	**0.22 J**	**0.68 J**	**3.2 J**	**2.1 J**	**0.0022 J**	**0.0028**	0.0020 U	0.0020 U	0.0020 U	**2.5 J**
alpha-BHC	0.00060	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.0073**	0.048 U	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
alpha-Chlordane	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.28 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
beta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.017**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.058**	0.049 U	**0.10 J**	0.10 U	0.0053 U	**0.0061 J**	0.0051 U	0.0050 U	0.0049 U	0.11 U
delta-BHC	NA	0.0050 U	0.0053 U	0.0050 U	**0.0061 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.067**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Dieldrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.086 J**	**0.086 J**	0.050 U	**0.22 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.26 J**
Endosulfan I	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.052 J**	0.0056 U	**0.21 J**	0.049 U	**0.44 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Endosulfan II	NA	0.0050 U	**0.0058**	0.0050 U	0.0054 U	0.0051 U	0.0050 U	**0.048**	**0.048 J**	**0.83**	**0.27 J**	0.050 U	**0.27 J**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.23 J**
Endosulfan Sulfate	NA	0.0050 U	0.0053 U	0.0050 U	**0.0074 J**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.060 J**	**0.12**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.13 J**
Endrin	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.061 J**	0.048 U	**0.34 J**	0.050 U	**0.61**	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.63**
Endrin Aldehyde	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	**0.011**	**0.19 J**	0.049 U	0.050 U	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	**0.11 J**
Endrin Ketone	NA	0.020 U	0.021 U	0.020 U	0.021 U	0.020 U	0.020 U	0.020 U	0.022 U	0.19 U	0.20 U	0.20 U	0.41 U	0.021 U	0.020 U	0.020 U	0.020 U	0.020 U	0.42 U
gamma-BHC (Lindane)	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	**0.056**	0.049 U	**0.069 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
gamma-Chlordane	NA	0.0050 U	0.0053 U	**0.011**	**0.012**	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**1.1 J**	0.10 U	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor	NA	0.0050 U	0.0053 U	0.0050 U	0.0054 U	0.0051 U	0.0050 U	0.0050 U	0.0056 U	0.048 U	0.049 U	**0.054 J**	1.0 UJ	0.0053 U	0.0049 U	0.0051 U	0.0050 U	0.0049 U	0.11 U
Heptachlor Epoxide	NA	0.0030 U	0.0032 U	0.0030 U	0.0032 U	0.0031 U	0.0030 U	0.0030 U	**0.089 J**	**0.14 J**	**0.093 J**	**0.37 J**	**0.29 J**	0.0032 U	0.0030 U	0.0030 U	0.0030 U	0.0029 U	**0.34 J**
Methoxychlor	NA	0.0099 U	0.011 U	0.0099 U	0.011 U	0.01 U	0.01 U	**0.014 J**	0.011 U	0.097 U	**0.11 J**	0.10 U	0.21 U	0.011 U	0.0099 U	0.01 U	0.01 U	0.0098 U	0.21 U
Toxaphene	NA	0.050 U	0.053 U	0.050 U	0.054 U	0.051 U	0.050 U	0.050 U	0.056 U	0.48 U	0.49 U	0.50 U	1.0 U	0.053 U	0.049 U	0.051 U	0.050 U	0.049 U	1.1 U

TABLE A-3: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]

March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Semivolatile Organic Compounds (µg/L)																			
(3+4)-Methylphenol (m,p-Cresol)	NA	1.0 U	1.0 U	0.98 U	**1.0**	**1.5**	0.99 U	1.0 U	1.0 U	**11**	**28**	**1,700**	**56**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**70**
1,2,4-Trichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,2-Diphenylhydrazine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dichlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,3-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dichlorobenzene	NA	1.0 U	**1.2**	**3.5**	**3.1**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1,4-Dinitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
1-Methylnaphthalene	1.51	--	--	**10**	**9.0**	--	--	--	--	**3.4**	--	**14**	**3.5 J**	--	--	--	--	--	**5.4 J**
2,3,4,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**5.7**	1.3 UJ	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.6 UJ
2,3,5,6-Tetrachlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,3-Dichloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4,5-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.4**	**2.3**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**3.2**
2,4,6-Trichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dichlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,4-Dimethylphenol	380	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**130**	**140**	**3,100**	**470**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**590**
2,4-Dinitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	8.0 U	5.1 U	4.8 U	4.9 U	8.1 U	5.0 U	4.8 U	5.1 U
2,4-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2,6-Dinitrotoluene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chloronaphthalene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Chlorophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Methylnaphthalene	NA	--	--	**5.6**	**4.5**	--	--	--	--	**2.6**	**1.1**	**16**	**3.7 J**	--	--	--	--	--	**6.6 J**
2-Methylphenol (o-Cresol)	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	**7.2**	**20**	**1,300**	**51**	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	**60**
2-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
2-Nitrophenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3,3'-Dichlorobenzidine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
3-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4,6-Dinitro-2-methylphenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	7.3 U	5.1 U	4.8 U	4.9 U	7.4 U	5.0 U	4.8 U	5.1 U
4-Bromophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloro-3-methylphenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chloroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Chlorophenyl-phenylether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitroaniline	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
4-Nitrophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Acenaphthene	NA	--	--	**2.1**	**1.6**	--	--	--	--	--	--	**1.0**	--	--	--	--	--	--	--
Acenaphthylene	NA	--	--	--	--	--	--	--	--	**1.4**	--	--	--	--	--	--	--	--	--
Aniline	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Benzidine	NA	5.0 U	--	4.9 U	--	5.1 U	--	5.0 U	--	5.0 U	--	5.0 U	--	4.8 U	--	5.1 U	5.0 U	--	--
Benzyl alcohol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethoxy)methane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroethyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Chloroisopropyl)ether	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
bis(2-Ethylhexyl)phthalate	1.2	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
bis-2-Ethylhexyladipate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Butylbenzylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Carbazole	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dibenzofuran	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**2.0**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Diethylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Dimethylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-butylphthalate	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	5.0 U	5.1 U	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	5.1 U
Di-n-octylphthalate	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Fluorene	NA	--	--	**1.5**	**1.0**	--	--	--	--	--	--	**1.6**	**1.0**	--	--	--	--	--	**1.3**
Hexachlorobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorobutadiene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	10 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Hexachlorocyclopentadiene	NA	1.0 U	1.3 U	0.98 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.0 U	1.3 U	1.3 U	1.3 U	0.96 U	1.3 U	1.3 U	1.0 U	1.2 U	1.3 U
Hexachloroethane	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Isophorone	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Naphthalene	NA	--	--	--	--	--	--	--	--	**1.4**	--	**19**	**4.9 J**	--	--	--	--	--	**9.5 J**
Nitrobenzene	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	13 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodimethylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitroso-di-n-propylamine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
n-Nitrosodiphenylamine	NA	1.0 U	1.0 U	1.8 UJ	**1.3**	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pentachlorophenol	NA	5.0 U	5.2 U	4.9 U	5.1 U	5.1 U	5.0 U	5.0 U	5.0 U	5.0 U	4.9 U	**80**	**21 J**	4.8 U	4.9 U	5.1 U	5.0 U	4.8 U	**26**
Phenanthrene	NA	--	--	**1.4**	**1.1**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	**1.8**	**7.8**	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U
Pyridine	NA	1.0 U	1.0 U	0.98 U	1.0 U	1.0 U	0.99 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	0.96 U	0.98 U	1.0 U	1.0 U	0.95 U	1.0 U

TABLE A-3: SUMMARY OF PCL EXCEEDANCES IN GROUNDWATER AND SEEP SAMPLES[1, 2]

March Point (Whitmarsh) Landfill, Skagit County, Washington

Analyte	PCL	MW-21-1		MW-21-2		MW-21-3		MW-21-4		MW-21-5		MW-21-6		MW-21-7		DUP-1-102821	MWD-21-1		MW-21-DUP-012722
		MW-21-1-102721	MW-21-1-012622	MW-21-2-102821	MW-21-2-012622	MW-21-3-102821	MW-21-3-012622	MW-21-4-102821	MW-21-4-012722	MW-21-5-102821	MW-21-5-012722	MW-21-6-102821	MW-21-6-012722	MW-21-7-102821	MW-21-7-012722	DUP-1-102821	MWD-21-1-102821	MWD-21-1-012622	MW-21-DUP-012722
		10/27/21	01/26/22	10/28/21	01/26/22	10/28/21	01/26/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	01/27/22	10/28/21	10/28/21	01/26/22	01/27/22
Polycyclic Aromatic Hydrocarbons (µg/L)																			
1-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	**0.23**	**0.33**	--	**0.78**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
2-Methylnaphthalene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	--	--	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Acenaphthene	NA	**0.23**	**0.45**	--	--	**0.15**	**0.14**	**0.23**	**0.28**	0.21 UJ	0.097 U	--	**0.43 J**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.68 J**
Acenaphthylene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	--	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.12 UJ
Anthracene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Benz[a]anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.031**	0.015 UJ	**0.057**	0.014 UJ	0.0096 UJ	0.0098 U	**0.011 J**	**0.013**	0.0095 U	0.01 U
Benzo(a)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.028**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.012 J**	**0.014**	0.0095 U	0.01 U
Benzo(b)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.034**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.016 J**	**0.015**	0.0095 U	0.01 U
Benzo(ghi)perylene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.016**	0.0097 U	0.050 U	0.01 U	0.0096 UJ	0.0098 U	**0.011 J**	0.01 U	0.0095 U	0.01 U
Benzo(j,k)fluoranthene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.011**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Chrysene	0.01	0.01 U	0.01 U	**0.011**	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.16**	0.0097 U	**0.057**	0.01 U	0.0096 UJ	0.0098 U	**0.021 J**	**0.015**	0.0095 U	0.01 U
Dibenzo(a,h)anthracene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	0.01 U	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Fluoranthene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 UJ	0.19 UJ	0.62 U	0.23 UJ	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.29 UJ
Fluorene	NA	**0.27**	**0.34**	--	--	0.10 U	0.099 U	**0.14**	0.10 U	**0.31**	0.097 U	--	--	0.096 U	0.098 U	0.10 U	**0.11**	0.095 U	--
Indeno(1,2,3-cd)pyrene	NA	0.01 U	0.01 U	0.0098 U	0.01 U	0.01 U	0.0099 U	0.01 U	0.01 U	**0.014**	0.0097 U	0.050 U	0.01 U	0.0096 U	0.0098 U	0.01 U	0.01 U	0.0095 U	0.01 U
Naphthalene	NA	**0.10**	0.10 U	**0.33**	**0.22**	0.10 U	0.099 U	0.10 U	0.10 U	--	**0.69**	--	--	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	--
Phenanthrene	NA	0.10 U	0.10 U	--	--	0.10 U	0.099 U	0.10 U	0.10 U	**0.25**	0.097 U	0.50 U	**0.33**	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	**0.35**
Pyrene	NA	0.10 U	0.10 U	0.098 U	0.10 U	0.10 U	0.099 U	0.10 U	0.10 U	0.10 U	0.097 U	0.50 U	0.10 U	0.096 U	0.098 U	0.10 U	0.10 U	0.095 U	0.10 U
Total cPAHs TEQ	NA	0.00755	0.00755	**0.00801**	0.00755	0.00755	0.00747	0.00755	0.00755	**0.0550**	0.00997	**0.0730**	0.00955	0.00725	0.00740	**0.0170**	**0.0185**	0.00717	0.00755
Volatile Organic Compounds (µg/L)																			
Benzene	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**3.3**	**7.8**	**4.3**	1.0 U	4.0 U	**18**	**8.6 J**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	**14 J**
Miscellaneous																			
Conductivity (µmhos/cm)	NA	--	**2,000**	--	**590**	--	**610**	--	**630**	--	**330**	--	**510**	--	**520**	--	--	**540**	**520**
Salinity (g/kg)	NA	--	**0.95**	--	**0.27**	--	**0.28**	--	**0.29**	--	**0.15**	--	**0.24**	--	**0.24**	--	--	**0.25**	**0.24**
pH (SU)	NA	**6.9**	**6.6**	**8.6**	**6.4**	**7.2**	**6.9**	**7.0**	**7.2**	**6.5**	**6.6**	**7.1**	**7.1**	**7.0**	**6.8**	**6.9**	**6.5**	**8.2**	**7.1**

Notes

1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = Reported value is an estimate.
   UJ = The analyte was not detected at the estimated reporting limit indicated.
2. **Bolded** values are detections, yellow highlighted cells are PQLs exceedances

Abbreviations

-- = analyte was not detected
µg/L = micrograms per liter
µmhos/cm = micromhos per centimeter
BHC = benzene hexachloride
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
DUP = duplicate
g/kg = grams per kilogram
NA = not available
PCBs = polychlorinated biphenyls
PCL = practical quantitation limit
SU = standard units
TEQ = toxic equivalency quotient

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	MW-01			MW-03	MW-04		MW-08	MW-10	G1		G3			G4		G5			G6	
Depth (ft bgs)	11.5	20.5	37	11.5	8.5	19	26-27.5	24.5-26	1	5.5	1	8	12	1	5	1	5	9	6	field dup.
Sample Date	10/7/2008			10/9/2008	10/8/2009		4/2/2010	4/1/2010	11/1/2008		10/31/2008			10/31/2008		11/2/2008			11/1/2008	
Metals (mg/kg)																				
Aluminum	11,900	12,300	29,900	11,500	17,100	11,200	NA	NA	18,600	18,800	16,800	15,200	20,200	17,200	17,700	16,200	16,000	18,500	13,400	14,200
Antimony	6 UJ	6 UJ	20 UJ	10 UJ	6 UJ	6 UJ	20 UJ	7 UJ	6 UJ	10 UJ	5 UJ	5 J	8 UJ	6 UJ	6 UJ	5 UJ	6 UJ	7 UJ	6 UJ	11 J
Arsenic	1.4 J	5.1 J	2.7 J	6.8 J	14 J	4.9 J	20 U	11	3.2	4.3	2.3	3	8.8	2.6	4.7	2.4	2.9	4.7	5.1	4.6
Barium	40.3	40.1	239	117	82.6	47	NA	NA	95.4	115	77.2	74.1	47.3	78.3	259	73.3	85.5	93.8	60.2	69.9
Beryllium	0.1	0.2	0.4	0.3 U	0.2	0.1 U	0.3 U	0.2	0.3	0.4	0.3	0.2	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Cadmium	0.2 U	0.2 U	0.6 U	0.8	0.5	0.2 U	1.3	0.4	0.5	2.6	0.3	0.5	0.5	0.4	2.7	0.4	0.7	0.7	0.5	0.6
Chromium	32.4	28.4	53	55	57.7	33.1	54	47.3	41.2	67	34.6	32.8	54.8	45.8	47.2	35.9	38.6	33.3	39.4	39.3
Copper	18.1	21.4	61	373	44.6	15.8	60.2	28	23.6	76	23.2	76	33.3	26.7	49.3	21.6	29.5	36.4	50	70.8
Iron	19,100	21,900	42,600	39,900	27,100	16,700	55,100	25,400	23,700	34,400	21,900	24,800	30,300	23,800	26,500	22,300	26,800	29,800	28,300	23,200
Lead	2	2 U	7	171	6	2 U	95	9	13	112	4	33	6	3	238	2	31	58	18	49
Manganese	245	315	771	400	352	208	406	270	596	431	280	340	301	318	345	303	351	508	292	253
Mercury	0.04 U	0.05 U	0.06	0.05 U	0.06	0.05 U	0.05	0.04	0.05 U	6.9	0.05 U	0.1	0.08	0.05 U	0.08	0.05 U	0.07	0.26	0.05 U	0.07
Molybdenum	1	1.4	3	4	2.7	2.3	NA	NA	2.1	6	1.6	2	3.9	1.8	2.7	1.8	2.7	2.4	3.7	4.6
Nickel	99	81	56	80	83	60	55 J	39 J	76	90	63	60	45	76	75	62	65	62	69	69
Selenium	6 U	6 U	20 U	10 U	6 U	6 U	20 U	7 U	6 U	10 U	5 U	5 U	8 U	6 U	6 U	5 U	6 U	7 U	6 U	6 U
Silver	0.4 U	0.3 U	1 U	0.9 U	0.4 U	0.4 U	1 U	0.4 U	0.4 U	0.8 U	0.3 U	0.3 U	0.5 U	0.3 U	0.3 U	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U
Strontium	24.4	19.4	72	29.3	35.9	33.2	NA	NA	33.6	33.3	47	29.2	58	46.6	48	47.7	32.1	31.4	26.7	30.9
Thallium	6 U	6 U	20 U	10 U	6 U	6 U	20 U	7 U	6 U	10 U	5 U	5 U	8 U	6 U	6 U	5 U	6 U	7 U	6 U	6 U
Titanium	956	1070	1200	949	1210	911	NA	NA	1,370	1,160	1,070	960	1,450	1,350	1,240	1,330	1,070	878	975	1,110
Vanadium	44.1	57.1	86	45.1	63.9	43.8	64 J	62.2 J	60.3	53.8	55.3	55	67.4	58.9	59.1	60.6	51.9	61.7	52.7	55.6
Zinc	43	39	99	282	84	40	245	75	81	381	63	174	82	79	311	187	225	187	175	345
TPH (mg/kg)																				
Gasoline-Range Organics (TPH-G)	8.3 U	7 U	8.7 U	8.3 U	7.2 U	7 U	19 U	16 U	11 U	5.5 U	6.8 U	6.7 U	13 U	7.1 U	7.8 U	6.1 U	6.5	310 J	6.6 U	7.8 U
Diesel-Range Organics (TPH-D)	NA	NA	NA	NA	NA	NA	7.1 U	7 U	12	61	17	21	11	5.7 U	64	5.4 U	120	280	11	14
Lube Oil (TPH-Oil)	NA	NA	NA	NA	NA	NA	25	14 U	49	330	39	75	45	20	380	11 U	480	670	55	48
SVOCs (µg/kg)																				
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	130	65 U	64 U
2,2'-Oxybis(1-chloropropane)	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	62 U	160	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	620 U	610 U	620 U	620 U	610 U	640 U	660 U	630 U	600 U	600 U	650 U	640 U	650 U	640 U
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
2-Chlorophenol	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	140	65 U	64 U
2-Methylphenol	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
2-Nitroaniline	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	MW-01			MW-03	MW-04		MW-08	MW-10	G1		G3			G4		G5			G6	
Depth (ft bgs)	11.5	20.5	37	11.5	8.5	19	26-27.5	24.5-26	1	5.5	1	8	12	1	5	1	5	9	6	field dup.
Sample Date	10/7/2008			10/9/2008	10/8/2009		4/2/2010	4/1/2010	11/1/2008		10/31/2008			10/31/2008		11/2/2008			11/1/2008	
SVOCs (µg/kg) (Continued)																				
2-Nitrophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
3-Nitroaniline	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	620 U	610 U	620 U	620 U	610 U	640 U	660 U	630 U	600 U	600 U	650 U	640 U	650 U	640 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
4-Chloroaniline	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
4-Methylphenol	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	180	65 U	64 U
4-Nitroaniline	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
4-Nitrophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
Acenaphthene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Acenaphthylene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	63	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Aniline	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Anthracene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	85	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Benzidine	NA	NA	NA	NA	NA	NA	620 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	270	61 U	64 U	66 U	63 U	60 U	60 U	65 U	130	65 U	64 U
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	240	61 U	64 U	66 U	63 U	60 U	60 U	65 U	120	65 U	64 U
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	160	61 U	64 U	66 U	63 U	60 U	60 U	65 U	100	65 U	64 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	71	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	210	61 U	64 U	66 U	63 U	60 U	60 U	65 U	110	65 U	64 U
Benzoic acid	NA	NA	NA	NA	NA	NA	620 U	610 U	620 U	620 U	610 U	640 U	660 U	630 U	600 U	600 U	650 U	640 U	650 U	640 U
Benzyl alcohol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Bis-(2-chloroethyl) ether	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Bis(2-ethylhexyl) phthalate	NA	NA	NA	NA	NA	NA	110	120	62 U	180	61 U	64 U	97	63 U	490	60 U	230	6,000	65 U	170
Butyl benzyl phthalate	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Carbaryl (Sevin)	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Carbazole	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Chrysene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	320	61 U	64 U	66 U	63 U	60 U	60 U	65 U	180	65 U	64 U
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Dibenzofuran	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Diethyl phthalate	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Di-n-Butyl phthalate	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Fluoranthene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	500	61 U	64 U	66 U	63 U	60 U	60 U	65 U	200	65 U	64 U
Fluorene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	72	65 U	64 U
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	MW-01			MW-03	MW-04		MW-08	MW-10	G1		G3			G4		G5			G6	
Depth (ft bgs)	11.5	20.5	37	11.5	8.5	19	26-27.5	24.5-26	1	5.5	1	8	12	1	5	1	5	9	6	field dup.
Sample Date	10/7/2008			10/9/2008	10/8/2009		4/2/2010	4/1/2010	11/1/2008		10/31/2008			10/31/2008		11/2/2008			11/1/2008	
SVOCs (µg/kg) (Continued)																				
Hexachloroethane	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Isophorone	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Naphthalene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	280	65 U	64 U
Nitrobenzene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
N-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
N-Nitroso-di-*N*-propylamine	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Pentachlorophenol	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
Phenanthrene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	510	61 U	64 U	66 U	63 U	60 U	60 U	120	300	65 U	64 U
Phenol	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	62 U	61 U	64 U	66 U	63 U	60 U	60 U	65 U	64 U	65 U	64 U
Pyrene	NA	NA	NA	NA	NA	NA	62 U	61 U	62 U	530	61 U	64 U	66 U	63 U	60 U	60 U	65 U	230	65 U	64 U
Pyridine	NA	NA	NA	NA	NA	NA	310 U	300 U	310 U	310 U	310 U	320 U	330 U	320 U	300 U	300 U	320 U	320 U	320 U	320 U
VOCs (µg/kg)																				
1,1,1,2-Tetrachloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,1,1-Trichloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,1,2,2-Tetrachloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,1,2-Trichloro-1,2,2-trifluoroethane	2.5 U	2 U	2.7 U	2.2 U	2.3 U	2.1 U	2.8 U	3.1 U	2.8 U	2.2 U	2.4 U	2.3 U	4.2 U	2.5 U	2.7 UJ	2.1 U	2 U	3.3 U	2.1 U	2.9 U
1,1,2-Trichloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,1-Dichloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,1-Dichloroethene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,2,3-Trichlorobenzene	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
1,2,3-Trichloropropane	2.5 U	2 U	2.7 U	2.2 U	2.3 U	2.1 U	2.8 U	3.1 U	2.8 U	2.2 U	2.4 U	2.3 U	4.2 U	2.5 U	2.7 UJ	2.1 U	2 U	3.3 U	2.1 U	2.9 U
1,2,4-Trichlorobenzene	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
1,2,4-Trimethylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	10	30	1.2 U	1.3 UJ	1 U	1 U	690	1 U	1.4 U
1,2-Dibromo-3-chloropropane	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
1,2-Dichlorobenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	15 J	1 U	1.4 U
1,2-Dichloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,2-Dichloropropane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,3,5-Trimethylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	3	18	1.2 U	1.3 UJ	1 U	1 U	240 J	1 U	1.4 U
1,3-Dichlorobenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
1,4-Dichlorobenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	4.9	2.1 U	1.2 U	1.3 UJ	1 U	1.3	20 J	1 U	1.4 U
2-Butanone	6.2 U	5 U	6.7 U	5.6 U	23 J	5.3 U	8.3	7.7 U	41	43	14	22	40	220	540 J	5.2 U	18	37 J	22	14
2-Chloroethyl vinyl ether	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
2-Chlorotoluene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
2-Hexanone	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
4-Chlorotoluene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
4-Isopropyltoluene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4	1.5 U	1.4 U	1.1 U	1.2 U	8.9	26	1.2 U	1.3 UJ	1 U	1 U	61 J	4	2.7
4-Methyl-2-pentanone (MIBK)	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	41	5.9 U	5.6 U	10 U	150	440 J	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
Acetone	16	11	19	36 J	95 J	11	46	24	360	110	160	120	240	240	440 J	37	110	190 J	130	100
Acrylonitrile	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
Benzene	1.2 U	1 U	1.3 U	5.5 J	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	11	1.2 U	1.3 UJ	1 U	1 U	14 J	1 U	1.4 U
Bromobenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Bromodichloromethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Bromoform	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	MW-01			MW-03	MW-04		MW-08	MW-10	G1		G3			G4		G5			G6	
Depth (ft bgs)	11.5	20.5	37	11.5	8.5	19	26-27.5	24.5-26	1	5.5	1	8	12	1	5	1	5	9	6	field dup.
Sample Date	10/7/2008			10/9/2008	10/8/2009		4/2/2010	4/1/2010	11/1/2008		10/31/2008			10/31/2008		11/2/2008			11/1/2008	
VOCs (µg/kg) (Continued)																				
Bromomethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Carbon disulfide	1.2 U	1.4	1.3 U	9.1 J	1.2 U	1 U	10	2.8	1.4 U	1.1 U	1.2 U	1.1 U	21	1.2 U	2.5 J	1 U	29	20 J	1.7	1.4 U
Carbon tetrachloride	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Chlorobenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	3.5	1.2 U	1.3 UJ	1 U	1 U	39 J	1 U	1.4 U
Chloroethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Chloroform	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Chloromethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
cis -1,2-Dichloroethene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
cis -1,3-Dichloropropene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Dibromochloromethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Dichlorodifluoromethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	2.1 J	1 U	1.4 U
Diethyl ether	130 U	130 U	93 U	97 U	99 U	130 U	1.4 U	1.5 U	5.8 U	5.4 U	5 U	5.6 U	9.4 U	6.3 U	6.8 U	5.2 U	130 U	11 U	6.1 U	6.1 U
Ethylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.4	3.6	1.2 U	1.3 UJ	1 U	1 U	33 J	1 U	1.4 U
Ethylene dibromide	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Hexachlorobutadiene	6.2 U	5 U	6.7 U	5.6 U	5.8 U	5.3 U	7 U	7.7 U	6.9 U	5.4 U	5.9 U	5.6 U	10 U	6.3 U	6.7 UJ	5.2 U	4.9 U	8.2 U	5.2 U	7.2 U
Isopropylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.7	8.9	1.2 U	1.3 UJ	1 U	1 U	69 J	1 U	1.4 U
m,p-Xylene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	2.6	1.2 U	2.8	12	1.8	2.3 J	1 U	1 U	120 J	1 U	1.4 U
Methyl tert-butyl ether	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Methylene chloride	2.5 U	2.4	2.7 U	3.4 J	2.3 U	2.2	2.8 U	3.1 U	2.8 U	2.2 U	2.4 U	2.3 U	4.2 U	2.5 U	2.7 UJ	2.2	2 U	3.3 U	2.5	2.9 U
n-Butylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.2	2.1 U	1.2 U	1.3 UJ	1 U	1 U	79 J	1 U	1.4 U
n-Propylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.5	4.6	1.2 U	1.3 UJ	1 U	1 U	100 J	1 U	1.4 U
o-Xylene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.4	5.3	1.2 U	1.3 UJ	1 U	1 U	64 J	1 U	1.4 U
sec-Butylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	4.9	1.2 U	1.3 UJ	1 U	1 U	59 J	1 U	1.4 U
Styrene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
tert-Butylbenzene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	19 J	1 U	1.4 U
Tetrachloroethene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.5	3	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Toluene	1.2 U	1 U	1.3 U	1.8 J	1.2 U	1 U	1.4 U	1.5 U	1.4 U	9.5	1.2 U	9.9	2.3	61	120 J	1 U	1	19 J	8	4.7
trans- 1,2-Dichloroethene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
trans -1,3-Dichloropropene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Trichloroethene	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Trichlorofluoromethane	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U
Vinyl chloride	1.2 U	1 U	1.3 U	1.1 U	1.2 U	1 U	1.4 U	1.5 U	1.4 U	1.1 U	1.2 U	1.1 U	2.1 U	1.2 U	1.3 UJ	1 U	1 U	1.6 U	1 U	1.4 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	MW-01			MW-03	MW-04		MW-08	MW-10	G1		G3			G4		G5			G6	
Depth (ft bgs)	11.5	20.5	37	11.5	8.5	19	26-27.5	24.5-26	1	5.5	1	8	12	1	5	1	5	9	6	field dup.
Sample Date	10/7/2008			10/9/2008	10/8/2009		4/2/2010	4/1/2010	11/1/2008		10/31/2008			10/31/2008		11/2/2008			11/1/2008	
PCBs (µg/kg)																				
Aroclor 1016	NA	NA	NA	3.9 U	NA	NA	3.9 U	3.9 U	3.9 U	110 U	3.8 U	3.8 U	3.9 U	3.9 U	38 U	3.8 U	20 UJ	39 UJ	19 U	3.8 U
Aroclor 1221	NA	NA	NA	3.9 U	NA	NA	3.9 U	3.9 U	3.9 U	110 U	3.8 U	3.8 U	3.9 U	3.9 U	38 U	3.8 U	20 UJ	39 UJ	19 U	3.8 U
Aroclor 1232	NA	NA	NA	3.9 U	NA	NA	5.8 U	3.9 U	3.9 U	110 U	3.8 U	3.8 U	3.9 U	3.9 U	38 U	3.8 U	20 UJ	39 UJ	19 U	3.8 U
Aroclor 1242	NA	NA	NA	3.9 U	NA	NA	3.9 U	3.9 U	3.9 U	110 U	3.8 U	3.8 U	3.9 U	3.9 U	38 U	3.8 U	20 UJ	39 UJ	19 U	3.8 U
Aroclor 1248	NA	NA	NA	28	NA	NA	3.9 U	3.9 U	3.9 U	110 U	3.8 U	20	3.9 U	3.9 U	76 U	3.8 U	29 UJ	120 UJ	19 U	3.8 U
Aroclor 1254	NA	NA	NA	27	NA	NA	3.9 U	3.9 U	3.9 U	110 U	3.8 U	22	3.9 U	3.9 U	240	3.8 U	39 UJ	110 J	76	31
Aroclor 1260	NA	NA	NA	7.8 U	NA	NA	3.9 U	3.9 U	3.9 U	360	3.8 U	13	3.9 U	3.9 U	38 U	3.8 U	39 UJ	39 UJ	19 U	9.9
Total PCBs	NA	NA	NA	55	NA	NA	5.8 U	3.9 U	3.9 U	360	3.8 U	104.6	3.9 U	3.9 U	240	3.8 U	39 UJ	110	76	40.9
Pesticides (µg/kg)																				
4,4'-DDD	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
4,4'-DDE	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	9.4 U	2.9 U	3.1 U	160 U	3 U	3.2 U
4,4'-DDT	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
Aldrin	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	3.3 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	390	1.5 U	1.6 U
alpha Chlordane	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
alpha-BHC	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	22 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
beta-BHC	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
delta-BHC	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	9.8	120	1.6 U	1.6 U	16 U	1.5 U	1.6 U	80 U	2.8	3.1
Dieldrin	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	28 U	3.2 U	24	3.2 U	3.2 U	14 U	2.9 U	3.1 U	210	3 U	3.2 U
Endosulfan I	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
Endosulfan II	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
Endosulfan sulfate	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
Endrin	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
Endrin aldehyde	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
Endrin ketone	NA	NA	NA	3.1 U	NA	NA	3.3 U	3.2 U	3.1 U	3 U	3.2 U	16 U	3.2 U	3.2 U	3.1 U	2.9 U	3.1 U	160 U	3 U	3.2 U
gamma-Chlordane	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
gamma-BHC (Lindane)	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
Heptachlor	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	1.5 U	1.6 U	8.1 U	1.6 U	1.6 U	4.8 U	1.5 U	1.6 U	80 U	1.5 U	1.6 U
Heptachlor epoxide	NA	NA	NA	1.6 U	NA	NA	1.6 U	1.6 U	1.6 U	10 U	1.6 U	15 U	1.6 U	1.6 U	14 U	1.5 U	1.6 U	80 U	1.5 U	5.6 U
Methoxychlor	NA	NA	NA	16 U	NA	NA	16 U	16 U	16 U	15 U	16 U	81 U	16 U	71	16 U	15 U	16 U	800 U	15 U	16 U
Toxaphene	NA	NA	NA	160 U	NA	NA	160 U	160 U	160 U	150 U	160 U	810 U	160 U	160 U	160 U	150 U	160 U	8,000 U	150 U	160 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	G10	G11	G17.5	G29	G30		G32	G35	G37
Depth (ft bgs)	8	11	7	9	7	DRUM [4]	12	15	10
Sample Date	11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
Metals (mg/kg)									
Aluminum	14,300	21,500	NA	NA	NA	NA	NA	NA	NA
Antimony	6 UJ	20 UJ	7 UJ	6 UJ	20 UJ	9 UJ	7 UJ	20 UJ	6 UJ
Arsenic	4.1	13	8	6 U	20 U	9 U	7	70	6
Barium	65	43	NA	NA	NA	NA	NA	NA	NA
Beryllium	0.2	0.4 U	0.3	0.1	0.5 U	0.2 U	0.1 U	0.6	0.1
Cadmium	0.3	0.7 U	0.4	0.3	0.9 U	0.5	0.8	0.9 U	0.3
Chromium	30.1	58	68.4	43.1	31	27.6	32.7	43	34.1
Copper	21.8	23.4	20.5	23.9	15.6	19.2	261	57.5	28.4
Iron	18,200	38,500	25,300	26,000	2,690	4,550	28,300	17,200	26,800
Lead	2 U	7 U	7	3	117	106	67	184	2
Manganese	210	336	282	279	30.7	33.3	330	138	435
Mercury	0.05 U	0.07 U	0.04	0.03	0.04 U	0.04 U	0.13	0.34	0.02 U
Molybdenum	1.9	5	NA	NA	NA	NA	NA	NA	NA
Nickel	67	34	55 J	78 J	211 J	190 J	179 J	495 J	361 J
Selenium	6 U	20 U	7 U	6 U	20 U	9 U	7 U	20 U	6 U
Silver	0.3 U	1 U	0.4 U	0.3 U	1 U	0.6 U	0.4 U	1 U	0.3 U
Strontium	32.8	64.1	NA	NA	NA	NA	NA	NA	NA
Thallium	6 U	20 U	7 U	6 U	20 U	9 U	7 U	20 U	6 U
Titanium	1,120	1,340	NA	NA	NA	NA	NA	NA	NA
Vanadium	53.6	77	66.4 J	56.9 J	98 J	89.1 J	57.3 J	356 J	42.2 J
Zinc	59	73	62	51	27	133	413	149	44
TPH (mg/kg)									
Gasoline-Range Organics (TPH-G)	6.4 U	12 U	26 U	26	32 U	18 U	350	90	13 U
Diesel-Range Organics (TPH-D)	6.1	7.5 U	7.7 U	2,000	9.3 UJ	73	640	140	47
Lube Oil (TPH-Oil)	16	15 U	16 U	3,400	19 UJ	120	270	130	87
SVOCs (µg/kg)									
1-Methylnaphthalene	64 U	64 U	64 U	80 UJ	62 U	110	3100	520	80
2,2'-Oxybis(1-chloropropane)	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
2,4,5-Trichlorophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
2,4,6-Trichlorophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
2,4-Dichlorophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
2,4-Dimethylphenol	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	130,000	58 U
2,4-Dinitrophenol	640 U	640 U	640 U	800 UJ	620 U	620 U	1,200 U	3,800 U	580 U
2,4-Dinitrotoluene	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
2,6-Dinitrotoluene	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
2-Chloronaphthalene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
2-Chlorophenol	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
2-Methylnaphthalene	64 U	64 U	64 U	80 UJ	62 U	62 U	1,700	700	110
2-Methylphenol	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	130,000	58 U
2-Nitroaniline	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	G10	G11	G17.5	G29	G30		G32	G35	G37
Depth (ft bgs)	8	11	7	9	7	DRUM [4]	12	15	10
Sample Date	11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
SVOCs (µg/kg) (Continued)									
2-Nitrophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
3,3'-Dichlorobenzidine	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
3-Nitroaniline	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
4,6-Dinitro-2-methylphenol	640 U	640 U	640 U	800 UJ	620 U	620 U	1200 U	3,800 U	580 U
4-Bromophenyl phenyl ether	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
4-Chloro-3-methylphenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
4-Chloroaniline	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
4-Chlorophenyl phenyl ether	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
4-Methylphenol	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	330,000	58 U
4-Nitroaniline	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
4-Nitrophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
Acenaphthene	64 U	64 U	64 U	80 UJ	62 U	62 U	410	380 U	58 U
Acenaphthylene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Aniline	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Anthracene	64 U	64 U	64 U	240 UJ	62 U	62 U	180	380 U	58 U
Benzidine	NA	NA	640 UJ	800 UJ	620 U	620 U	1,200 UJ	3,800 U	580 U
Benzo(a)anthracene	64 U	64 U	64 U	80 UJ	62 U	62 U	100 J	380 U	58 U
Benzo(a)pyrene	64 U	64 U	64 U	80 UJ	62 U	62 U	64 J	380 U	58 U
Benzo(b)fluoranthene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Benzo(g,h,i)perylene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Benzo(k)fluoranthene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Benzoic acid	640 U	640 U	640 U	800 UJ	620 U	620 U	1,200 U	15,000	580 U
Benzyl alcohol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
Bis(2-chloroethoxy)methane	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Bis-(2-chloroethyl)ether	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Bis(2-ethylhexyl) phthalate	64 U	64 U	52 J	80 UJ	62 U	49 J	92 J	380 U	42 J
Butyl benzyl phthalate	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Carbaryl (Sevin)	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Carbazole	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Chrysene	64 U	64 U	64 U	1,100 J	62 U	32 J	190	380 U	58 U
Dibenz(a,h)anthracene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Dibenzofuran	64 U	64 U	64 U	80 UJ	62 U	31 J	240	380 U	58 U
Diethyl phthalate	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Dimethyl phthalate	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Di-n-Butyl phthalate	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Di-n-octyl phthalate	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Fluoranthene	64 U	64 U	64 U	130 J	62 U	62 U	120 U	380 U	58 U
Fluorene	64 U	64 U	64 U	80 UJ	62 U	74	1,000	380 U	32 J
Hexachlorobenzene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Hexachlorobutadiene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Hexachlorocyclopentadiene	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	G10	G11	G17.5	G29	G30		G32	G35	G37
Depth (ft bgs)	8	11	7	9	7	DRUM [4]	12	15	10
Sample Date	11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
SVOCs (µg/kg) (Continued)									
Hexachloroethane	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Indeno(1,2,3-cd)pyrene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Isophorone	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
Naphthalene	68	64 U	64 U	80 UJ	62 U	62 U	180	380 U	58 U
Nitrobenzene	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	58 U
N-Nitrosodimethylamine	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
N-Nitroso-di-*N*-propylamine	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
N-Nitrosodiphenylamine	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	380 U	69 U
Pentachlorophenol	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
Phenanthrene	64 U	64 U	64 U	240 UJ	62 U	92	1,900	400	64
Phenol	64 U	64 U	64 U	80 UJ	62 U	62 U	120 U	73,000	58 U
Pyrene	64 U	64 U	64 U	620 J	62 U	62 U	450	380 U	58 U
Pyridine	320 U	320 U	320 U	400 UJ	310 U	310 U	610 U	1,900 U	290 U
VOCs (µg/kg)									
1,1,1,2-Tetrachloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,1,1-Trichloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,1,2,2-Tetrachloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	2.7 U	3.5 U	3.5 U	2.3 UJ	4.6 U	NA	2.6 U	4.5 U	2 U
1,1,2-Trichloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	4.3 U	20 U	1 U
1,1-Dichloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,1-Dichloroethene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,2,3-Trichlorobenzene	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
1,2,3-Trichloropropane	2.7 U	3.5 U	3.5 U	2.3 UJ	4.6 U	NA	2.6 U	4.5 U	2 U
1,2,4-Trichlorobenzene	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
1,2,4-Trimethylbenzene	1.3 U	42	1.8 U	1.1 UJ	2.3 U	NA	36	2.2 U	1 U
1,2-Dibromo-3-chloropropane	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
1,2-Dichlorobenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,2-Dichloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,2-Dichloropropane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,3,5-Trimethylbenzene	1.3 U	8.3	1.8 U	1.1 UJ	2.3 U	NA	8.9	2.2 U	1 U
1,3-Dichlorobenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
1,4-Dichlorobenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
2-Butanone	17	12	10	10 J	12 U	NA	17	53	5.1 U
2-Chloroethyl viny ether	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
2-Chlorotoluene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
2-Hexanone	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
4-Chlorotoluene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
4-Isopropyltoluene	1.3 U	7.2	1.8 U	1.1 UJ	2.3 U	NA	6.2	2.2 U	1 U
4-Methyl-2-pentanone (MIBK)	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
Acetone	130	90	47	52 J	24	NA	81	55	5.1 U
Acrylonitrile	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
Benzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	11	4.4	1 U
Bromobenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Bromodichloromethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Bromoform	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	G10	G11	G17.5	G29	G30		G32	G35	G37
Depth (ft bgs)	8	11	7	9	7	DRUM [4]	12	15	10
Sample Date	11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
VOCs (µg/kg) (Continued)									
Bromomethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 UJ	2.2 UJ	1 U
Carbon disulfide	2.2	5	12	22 J	2.3 U	NA	22	9.4	1 U
Carbon tetrachloride	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Chlorobenzene	6.3	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Chloroethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Chloroform	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Chloromethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 UJ	2.2 UJ	1 U
cis -1,2-Dichloroethene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
cis -1,3-Dichloropropene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Dibromochloromethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Dichlorodifluoromethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Diethyl ether	6 U	9.1 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Ethylbenzene	1.3 U	23	1.8 U	1.1 UJ	2.3 U	NA	1.4	2.2 U	1 U
Ethylene dibromide	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Hexachlorobutadiene	6.6 U	8.7 U	8.7 U	5.7 UJ	12 U	NA	6.6 U	11 U	5.1 U
Isopropylbenzene	1.3 U	7.3	1.8 U	1.1 UJ	2.3 U	NA	1.8	2.2 U	1 U
m,p-Xylene	1.3 U	23	1.8 U	1.1 UJ	2.3 U	NA	11	2.2 U	1 U
Methyl tert-butyl ether	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Methylene chloride	2.7 U	3.5 U	6 U	2.6 UJ	4.6 U	NA	2.6 U	4.5 U	2 U
n-Butylbenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
n-Propylbenzene	1.3 U	4.1	1.8 U	1.1 UJ	2.3 U	NA	4.5	2.2 U	1 U
o-Xylene	1.3 U	8.4	1.8 U	1.1 UJ	2.3 U	NA	6.1	2.2 U	1 U
sec-Butylbenzene	1.3 U	3.1	1.8 U	2.3 J	2.3 U	NA	5.6	2.2 U	1 U
Styrene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
tert-Butylbenzene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Tetrachloroethene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Toluene	1.3 U	1.9	1.8 U	1.1 UJ	2.3 U	NA	9.1	4.1	1 U
trans- 1,2-Dichloroethene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
trans -1,3-Dichloropropene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Trichloroethene	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U
Trichlorofluoromethane	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 UJ	2.2 UJ	1 U
Vinyl chloride	1.3 U	1.8 U	1.8 U	1.1 UJ	2.3 U	NA	1.3 U	2.2 U	1 U

TABLE L-1

SUMMARY OF MONITORING WELL AND TEST PIT SOIL SAMPLES
OCTOBER AND NOVEMBER 2008, APRIL 2010[1,2]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID [3]	G10	G11	G17.5	G29	G30		G32	G35	G37
Depth (ft bgs)	8	11	7	9	7	DRUM [4]	12	15	10
Sample Date	11/1/2008	10/31/2008	4/1/2010	3/31/2010	3/31/2010	3/31/2010	3/31/2010	4/1/2010	3/31/2010
PCBs (µg/kg)									
Aroclor 1016	4 U	3.9 U	3.9 U	16 U	3.9 U	3.9 U	29 U	78 U	3.8 U
Aroclor 1221	4 U	3.9 U	3.9 U	16 U	3.9 U	3.9 U	29 U	78 U	3.8 U
Aroclor 1232	4 U	3.9 U	3.9 U	16 U	3.9 U	3.9 U	29 U	78 U	3.8 U
Aroclor 1242	4 U	3.9 U	3.9 U	16 U	3.9 U	3.9 U	29 U	78 U	3.8 U
Aroclor 1248	4 U	3.9 U	3.9 U	39 U	39 U	20 U	44	1,200 U	3.8 U
Aroclor 1254	4 U	3.9 U	3.9 U	16 U	3.9 U	39 U	42	1,200 U	3.8 U
Aroclor 1260	8 U	3.9 U	3.9 U	16 U	3.9 U	3.9 U	29 U	78 U	3.8 U
Total PCBs	8 U	3.9 U	3.9 U	39 U	39 U	39 U	86	1,200 U	3.8 U
Pesticides (µg/kg)									
4,4'-DDD	3.1 U	3.1 U	3.2 U	4.4	3.3 U	3.2 U	3.2 U	140 U	3.1 U
4,4'-DDE	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	620	3.1 U
4,4'-DDT	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	5.2 U	8.2 U	3.1 U
Aldrin	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	160 U	1.6 U
alpha Chlordane	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	4.1 U	1.6 U
alpha-BHC	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	7.9 U	1.6 U
beta-BHC	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	27 U	1.6 U
delta-BHC	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	38 U	1.6 U
Dieldrin	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	330 U	3.1 U
Endosulfan I	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	160 U	1.6 U
Endosulfan II	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	49 U	3.1 U
Endosulfan sulfate	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	11 U	3.1 U
Endrin	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	8.2 U	3.1 U
Endrin aldehyde	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	8.2 U	3.1 U
Endrin ketone	3.1 U	3.1 U	3.2 U	3.3 U	3.3 U	3.2 U	3.2 U	8.2 U	3.1 U
gamma-Chlordane	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	220	1.6 U
gamma-BHC (Lindane)	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	4.1 U	1.6 U
Heptachlor	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	160 U	1.6 U
Heptachlor epoxide	1.6 U	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	160 U	1.6 U
Methoxychlor	16 U	16 U	16 U	17 U	16 U	16 U	16 U	41 U	16 U
Toxaphene	160 U	160 U	160 U	660 U	160 U	160 U	640 U	1,600 U	160 U

Notes
1. Data qualifiers are as follows:
   J = Reported value is an estimate.
   U = analyte was note detected at reporting limit indicated
   UJ = analyte was not detected at the concentration indicated, which is the estimated reporting limit.
2. NA = Not analyzed.
3. MW prefix indicates monitoring well borings; G prefix indicates test pit samples.
4. Material sample found inside a drum in the test pit.

Abbreviations
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
bgs = below ground surface
ft = feet
PCBs = polychlorinated biphenyls
PSL = preliminary screening levels
SVOCs = semivolatile organic compounds
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

TABLE L-2

SUMMARY OF TEST PIT SOIL SAMPLES
DIOXIN AND FURAN RESULTS
MARCH 2013[1,2]

March Point (Whitmarsh) Landfill
Skagit County, Washington

Location Sample ID Depth (ft bgs) Sample Date	Cleanup Level[2]	G-41 G-41-10-0313 10 3/27/2013	G-42 G-42-11-0313 11 3/27/2013	G-43 G-43-8-0313 8 3/27/2013
Dioxins/Furans (pg/g)				
1,2,3,4,6,7,8-HpCDD	NE	34.7	2.08	43.6
1,2,3,4,6,7,8-HpCDF	NE	7.32	0.448 J	6.67
1,2,3,4,7,8,9-HpCDF	NE	0.36 JEMPC	0.0739 U	0.301 JEMPC
1,2,3,4,7,8-HxCDD	NE	0.484 J	0.0579 U	0.0881 U
1,2,3,4,7,8-HxCDF	NE	0.387 J	0.0739 U	0.523 J
1,2,3,6,7,8-HxCDD	NE	3.23	0.142 JEMPC	2.01
1,2,3,6,7,8-HxCDF	NE	0.315 JEMPC	0.0579 J	0.313 J
1,2,3,7,8,9-HxCDD	NE	1.8	0.0619 U	0.742 JEMPC
1,2,3,7,8,9-HxCDF	NE	0.0811 U	0.0999 U	0.227 J
1,2,3,7,8-PeCDD	NE	0.904 J	0.0679 J	0.106 JEMPC
1,2,3,7,8-PeCDF	NE	0.257 JEMPC	0.032 J	0.249 JEMPC
2,3,4,6,7,8-HxCDF	NE	0.505 J	0.0759 U	0.376 JEMPC
2,3,4,7,8-PeCDF	NE	0.426 J	0.046 JEMPC	0.317 JEMPC
2,3,7,8-TCDD	NE	0.320 U	0.136 U	0.346 U
2,3,7,8-TCDF	NE	3.57	0.05 U	1.58
OCDD	NE	292	20.9	558
OCDF	NE	14.9	1.25 JEMPC	16.1
Total TEQ	11	2.58	0.13	1.46
Homolog Group Concentrations				
Total HpCDD	NE	72.1	3.9	96.6
Total HpCDF	NE	19.9 EMPC	1.23 EMPC	26 EMPC
Total HxCDD	NE	27.7 EMPC	1.35 EMPC	13.1 EMPC
Total HxCDF	NE	8.29 EMPC	0.565 EMPC	13 EMPC
Total PeCDD	NE	8.15 EMPC	0.345 EMPC	1.54 EMPC
Total PeCDF	NE	6.06 EMPC	0.33 EMPC	6.53 EMPC
Total TCDD	NE	6.19 EMPC	0.721 EMPC	1.04 EMPC
Total TCDF	NE	12.6 EMPC	0.787 EMPC	5.8 EMPC

Notes
1. Data qualifiers are as follows:
   EMPC = Estimated Maximum Possible Concentration
   J = Reported value is an approximation.
   U = Analyte not detected at the reporting limit shown.
2. Cleanup levels are Washington State Department of Ecology Model Toxics Control Act (MTCA) Method B soil cleanup levels and based on the total toxic equivalent concentration in 2,3,7,8-TCDD equivalents.

Abbreviations
bgs = below ground surface
ft = feet
NE = not established
pg/g = picogram per gram

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW-02							MW-03							MW-03 (duplicate)			
Sample Date	**10/14/2008**	**12/18/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**
Dissolved Metals (µg/L)																		
Aluminum	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U
Antimony	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U
Arsenic	1.9	2.2	2.3 J-	2.5	2.3	2.9	2.7	4.1	0.5	0.5 J-	4.1	2.5	3.5	4.3	4	0.4	0.5 J-	4.1
Barium	20	12	9 J-	10	NA	NA	NA	50	35	50 J	92	NA	NA	NA	50	36	52 J-	94
Beryllium	1 U	1 U	1 UJ	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U
Cadmium	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U
Chromium	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U
Copper	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U
Iron	50 U	50 U	50 UJ	50 U	NA	NA	NA	11,800	50 U	370 J-	13,400	NA	NA	NA	12,000	50 U	1,360 J-	13,600
Lead	1 U	1 U	1 UJ	1 U	3	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U
Manganese	41	45	21 J-	25	NA	NA	NA	332	227	276 J-	319	NA	NA	NA	336	226	284 J-	327
Mercury	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U
Molybdenum	11	16	6 J-	6	NA	NA	NA	9	10	5 UJ	5 U	NA	NA	NA	9	10	5 UJ	5 U
Nickel	4.1	4	3.7 J-	4	NA	NA	NA	1.1	0.6	0.8 J-	0.6	NA	NA	NA	1.1	0.6	0.8 J-	0.9
Selenium	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U
Silver	3 U	3 U	3 UJ	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U
Strontium	154	191	154 J-	137	NA	NA	NA	208	156	186 J-	210	NA	NA	NA	210	159	186 J-	215
Thallium	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U
Titanium	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U
Vanadium	4	3 U	3 J-	4	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U
Zinc	10 U	10 U	10 UJ	10 U	NA	NA	NA	10 U	10 U	10 UJ	10 U	NA	NA	NA	10 U	10 U	10 UJ	10 U
Total Metals (µg/L)																		
Aluminum	50 U	50 U	80	50	NA	NA	NA	460 J	50 U	50 U	50 U	NA	NA	NA	50 J	50 U	50 U	50 U
Antimony	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U
Arsenic	2	2.2	2.3	2.8	4.8	2.9	2.5	4.9	2.7	2.8	4.1	2.5	3.5	4.1	4.4	2.8	2.7	4
Barium	23	12	9	10	NA	NA	NA	60	63	82	87	NA	NA	NA	53	66	76	90
Beryllium	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Cadmium	2 U	2 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U
Chromium	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
Copper	2 U	2 U	2 U	2 U	NA	NA	NA	3	2 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U
Iron	60	50 U	70	80	NA	NA	NA	13,400	12,200	14,600	12,500	NA	NA	NA	12,400	12,300	13,300	12,900
Lead	1 U	1 U	1 U	1 U	2	1 U	1 U	16 J	1 U	1 U	1 U	1 U	1 U	1 U	2 J	1 U	1 U	1 U
Manganese	46	46	47	64	NA	NA	NA	350	254	301	307	NA	NA	NA	349	258	282	316
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Molybdenum	12	15	6	6	NA	NA	NA	8	9	5 U	5 U	NA	NA	NA	9	9	5 U	5 U
Nickel	4.7	3.4	4.4	5.4	NA	NA	NA	2.8 J	0.6	0.8	0.9	NA	NA	NA	1.3 J	0.5	0.9	0.8
Selenium	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U
Silver	3 U	3 U	3 U	3 U	NA	NA	NA	3 U	3 U	3 U	3 U	NA	NA	NA	3 U	3 U	3 U	3 U
Strontium	163	195	155	130	NA	NA	NA	214	168	196	193	NA	NA	NA	218	172	186	198
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Titanium	5 U	5 U	6	7	NA	NA	NA	27 J	5 U	5 U	5 U	NA	NA	NA	5 UJ	5 U	5 U	5 U
Vanadium	4	3 U	4	4	NA	NA	NA	3 U	3 U	3 U	3 U	NA	NA	NA	3 U	3 U	3 U	3 U
Zinc	10 U	10 U	10 U	10 U	NA	NA	NA	30 J	10 U	10 U	10 U	NA	NA	NA	10 UJ	10 U	10 U	10 U
TPH (mg/L)																		
Gasoline Range Organics	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U
Diesel Range Organics	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U
Lube Oil	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs (µg/L)																		
1-Methylnaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2,2'-Oxybis(1-chloropropane)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2,4,5-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2,4-Dimethylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2-Chloronaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2-Chlorophenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2-Methylnaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
2-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
2-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW-02							MW-03							MW-03 (duplicate)			
Sample Date	**10/14/2008**	**12/18/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**
SVOCs (µg/L) (Continued)																		
3-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U
4-Bromophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
4-Chloro-3-methylphenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
4-Chloroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
4-Chlorophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
4-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
4-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
4-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
Acenaphthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Acenaphthylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Aniline	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzidine	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U
Benzo(a)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzo(a)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzo(b)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzo(g,h,i)perylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzo(k)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzoic acid	10 U	R	10 U	10 U	NA	NA	NA	10 U	R	10 U	10 U	NA	NA	NA	10 U	R	R	10 U
Benzyl alcohol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
bis(2-Chloroethoxy)methane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
bis-(2-Chloroethyl) ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
bis(2-Ethylhexyl) phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1.2	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Butyl benzyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Carbaryl (Sevin)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Carbazole	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Chrysene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Dibenz(a,h)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Dibenzofuran	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Diethyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Dimethyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Di-n-butyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Di-n-octyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Fluorene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Hexachlorobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
Hexachloroethane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Indeno(1,2,3-cd)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Isophorone	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Naphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Nitrobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
N- Nitrosodimethylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
N- Nitroso-di-N-propylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
N- Nitrosodiphenylamine	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Pentachlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
Phenanthrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Phenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Pyridine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U
PAHs (µg/L)																		
1-Methylnaphthalene	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U
2-Methylnaphthalene	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U
Acenaphthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.032	0.017 J	0.012	0.024	NA	NA	NA	0.032	0.017 J	0.013	0.028
Acenaphthylene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Benzo(a)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Benzo(a)pyrene	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U
Benzo(b)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Benzo(g,h,i)perylene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Benzo(k)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Chrysene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW-02							MW-03							MW-03 (duplicate)			
Sample Date	**10/14/2008**	**12/18/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**
PAHs (µg/L) (Continued)																		
Dibenz(a,h)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Dibenzofuran	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U
Fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Fluorene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Indeno(1,2,3-cd)pyrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Naphthalene	0.02 U	0.013 UJ	0.011 U	0.01 U	NA	NA	NA	0.015 U	0.013 UJ	0.01 U	0.011 U	NA	NA	NA	0.013 U	0.01 UJ	0.014 U	0.016 U
Phenanthrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Pyrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U
Total Benzofluoranthenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (µg/L)																		
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 UJ	0.2 U
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U
2-Chloroethyl vinyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
4-Methyl-2-pentanone (MIBK)	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U
Acetone	4.6	3 U	2.5 U	5 U	NA	NA	NA	3.1	3.6 U	3.4 U	5 U	NA	NA	NA	3.8	8.8 U	2.5 U	5 U
Acrylonitrile	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U
Benzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform	1.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane	0.4	0.2 U	0.3 U	0.5 U	NA	NA	NA	0.2 U	0.2 UJ	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.5 J	0.2 U	0.5 U
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Ethyl ether	1 U	NA	1 U	1 U	NA	NA	NA	1 U	NA	1 U	1 U	NA	NA	NA	1 U	NA	1 U	1 U
Ethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Ethylene dibromide	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
m,p-Xylene	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U
Methyl tert-butyl ether	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U
n-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Styrene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 UJ	0.2 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW-02							MW-03							MW-03 (duplicate)			
Sample Date	**10/14/2008**	**12/18/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**	**4/13/2010**	**7/13/2010**	**10/7/2010**	**10/14/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**
VOCs (µg/L) (Continued)																		
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl chloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U
PCBs (µg/L)																		
Aroclor 1016	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Aroclor 1221	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Aroclor 1232	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.029 J	0.019	0.01 U	0.01 U	0.015 U	0.01 U	0.01 U	0.031 J	0.022	0.01 U
Aroclor 1242	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	0.013 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.031	0.014 J	0.01 U	0.01 U
Aroclor 1248	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.05 U	0.03 U	0.01 U	0.015 U	0.01 U	0.01 UJ	0.01 U	0.04 U
Aroclor 1254	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.015 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Aroclor 1260	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U
Total PCBs	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.03	0.042	0.019	0.05 U	0.03 U	0.015 U	0.015 U	0.031	0.045	0.022	0.04 U
Pesticides (µg/L)																		
4,4'-DDD	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	**0.0056 J**	**0.0058**	**0.0075**	**0.0072**	**0.0074**	0.0083 U	0.0033 U	**0.0061 J**	**0.0061**	**0.0082**
4,4'-DDE	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
4,4'-DDT	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Aldrin	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.0042 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U
alpha-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U
alpha-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	**0.015**	**0.031 J**	**0.041**	**0.016**	**0.026**	**0.034**	**0.027**	**0.015**	**0.036 J**	**0.039**	**0.018**
beta-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0074	0.0075 J	0.0078	0.0041	0.0069	0.009	0.0082	0.007	0.007 J	0.0076	0.0047
cis-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.0042 U	NA	NA	NA	NA
delta-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 UJ	0.0017 U	0.0019 J	0.0012	0.00083 U	0.0008 U	0.0013	0.0042 UJ	0.0017 U	0.0016 J	0.0012	0.00083 U
Dieldrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Endosulfan I	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.0042 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U
Endosulfan II	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Endosulfan sulfate	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Endrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Endrin aldehyde	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
Endrin ketone	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0083 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U
gamma-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.0018 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.003 UJ	0.00083 U	0.00083 U
gamma-BHC (Lindane)	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00096	0.00083 U	0.0008 U	0.00083 U	0.0042 U	0.0017 U	0.00083 UJ	0.0011	0.00083 U
Heptachlor	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.0042 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U
Heptachlor epoxide	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.0042 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U
Methoxychlor	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.042 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U
Toxaphene	0.17 U	0.083 UJ	0.083 U	0.083 U	0.08 U	0.083 U	0.083 U	0.17 U	0.083 UJ	0.083 U	0.083 U	0.08 U	0.083 U	0.42 U	0.17 U	0.083 UJ	0.083 U	0.083 U
trans-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.0042 U	NA	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW05					MW06					MW07					MW08			MW09					MW09 (duplicate)
Sample Date	4/14/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/26/2013	8/17/2013	4/14/2010	7/13/2010	10/7/2010	4/14/2010	7/13/2010	10/7/2010	3/26/2013	8/17/2013	3/26/2013
Dissolved Metals (µg/L)																								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Arsenic	2.5	2.2	2.3	1.4	1.6	0.7	0.7	0.8	1.2	0.9	0.5 U	0.5 U	0.5 U	1 U	0.9	2.2	1.8	1.6	1.2	1.4	1.4	1.7	1.5	1.7
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chromium	5 U	5 U	5 U	5 U	5 U	6	6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Copper	3	4	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	5	6	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Iron	4,510	6,980	8,450	20,000	15,500	98,400	102,000	97,700	77,900	92,200	4,520	3,940	2,370	5,820	1,540	34,300	36,600	46,600	19,000	22,400	21,300	22,900	24,500	22,700
Lead	1 U	1 U	1 U	0.1 U	0.1 U	1 U	1 U	1 U	0.2	0.1	1 U	1 U	1 U	0.1 U	0.1	1 U	1 U	1 U	1 U	1 U	1 U	0.1 U	0.1 U	0.1 U
Manganese	294	573	487	664	511	2,730	2,670	2,220	2,310	2,300	579	372	217	673	183	1,680	1,660	2,390	449	543	447	531	565	529
Mercury	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.020 U
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	4.1	4.1	3 J+	3.2	3.9	1.9	2	2 J+	3.6	2.6	2	2.2	1.9	3.6	1	1.1	1.1	1.2 J+	0.5	0.6	2.4	1.8	1.4	1.6
Selenium	50 U	50 U	50	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Silver	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Titanium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	5	3 U	3 U	3 U	3 U	12	13	11	9	12	4	5	5	4	5	3 U	3 U	4	3 U	3 U	3 U	3 U	3 U	3 U
Zinc	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (µg/L)																								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Arsenic	1.7	3	2.2	1.4	1.8	1	1.2	0.7	1.2	1	0.5 U	0.9	0.5 U	1 U	1	2.2	1.7	1.8	1.4	1.3	1.4	1.7	1.4	1.8
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Chromium	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	35 J	5 U	5 U	5 U	5 U	5 U	5 U
Copper	5	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	9	5	2 U	2 U	4	3	2 U	2	3	3	2 U	2 U	2 U	2 U
Iron	4,820	6,020	8,440	20,100	9,590	101,000	102,000	95,700	74,600	91,400	4,590	3,650	2,710	5,720	1,590	38,800	37,300	42,900	19,600	22,800	19,400	22,800	24,000	23,100
Lead	1 U	1 U	1 U	0.1 U	0.1 U	1 U	1 U	1 U	0.5	0.2	1 U	1 U	1 U	0.1 U	0.1 U	3	1 U	1 U	3	1 U	1 U	0.1	0.3	0.1
Manganese	309	570	484	665	341	2,720	2,690	2,270	2,240	2,340	581	356	234	672	185	1,990	1,790	2,140	464	548	411	546	551	555
Mercury	0.02 U	0.02 U	0.0286	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.020 U	0.020 U	0.020 U
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	5.1	3.8	5.4	3.4	4.6	1.8	2	5	3.4	2.8	6.4 J	1.8	2	4	1.2	1.6	1.1	1.6	3.7	0.6	2.6	1.8	1.7	1.8
Selenium	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Silver	7	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Titanium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	6	3 U	3 U	3	3 U	12	13	12	10	12	5	5	6	4	6	4	3	3	6	3 U	3 U	3 U	3 U	3 U
Zinc	10 U	10 U	10 UJ	10 U	10 U	10 U	10	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	20	10	10 U	50 J	10	10 U	10 U	10 U	10 U	10 U
TPH (mg/L)																								
Gasoline Range Organics	0.25 U	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA
Diesel Range Organics	0.25 U	0.1 U	0.1 U	NA	NA	0.25 U	0.1 U	0.1 U	NA	NA	0.25 U	0.1 U	0.1 U	NA	NA	0.25 U	0.1 U	0.1 U	0.25 U	0.1 U	0.1 U	NA	NA	NA
Lube Oil	0.5 U	0.2 U	0.2 U	NA	NA	0.5 U	0.2 U	0.2 U	NA	NA	0.5 U	0.2 U	0.2 U	NA	NA	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	NA	NA	NA
SVOCs (µg/L)																								
1-Methylnaphthalene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2,4,5-Trichlorophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2,4,6-Trichlorophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dichlorophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dimethylphenol	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2,4-Dinitrophenol	10 U	10 UJ	10 U	NA	NA	10 U	10 UJ	10 U	NA	NA	10 U	10 UJ	10 U	NA	NA	10 U	10 UJ	10 U	10 U	10 UJ	10 U	NA	NA	NA
2,4-Dinitrotoluene	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2,6-Dinitrotoluene	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2-Chloronaphthalene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2-Chlorophenol	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylnaphthalene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylphenol	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
2-Nitroaniline	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2-Nitrophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
3,3'-Dichlorobenzidine	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW05					MW06					MW07					MW08			MW09					MW09 (duplicate)
Sample Date	4/14/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/26/2013	8/17/2013	4/14/2010	7/13/2010	10/7/2010	4/14/2010	7/13/2010	10/7/2010	3/26/2013	8/17/2013	3/26/2013
SVOCs (µg/L) (Continued)																								
3-Nitroaniline	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA
4-Bromophenyl phenyl ether	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
4-Chloro-3-methylphenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chloroaniline	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chlorophenyl phenyl ether	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
4-Methylphenol	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	6.4	1 U	1 U	3.9	1 U	NA	NA	NA
4-Nitroaniline	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
4-Nitrophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Acenaphthene	1 U	1 U	1 U	NA	NA	3.5	3.2	4.4	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Acenaphthylene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Aniline	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Anthracene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzidine	R	10 UJ	10 U	NA	NA	R	10 UJ	10 UJ	NA	NA	10 UJ	10 UJ	10 UJ	NA	NA	R	10 UJ	10 UJ	R	10 UJ	10 U	NA	NA	NA
Benzo(a)anthracene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(a)pyrene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(b)fluoranthene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(g,h,i)perylene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(k)fluoranthene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzoic acid	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	NA	NA	10 U	10 U	10 U	10 U	14	10 U	NA	NA	NA
Benzyl alcohol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
bis(2-Chloroethoxy)methane	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
bis-(2-Chloroethyl)ether	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
bis(2-Ethylhexyl) phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1.3	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	**2.4**	**NA**	**NA**	**NA**
Butyl benzyl phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Carbaryl (Sevin)	2 U	2 U	2 U	NA	NA	2 U	2 U	2 U	NA	NA	2 U	2 U	2 U	NA	NA	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA
Carbazole	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Chrysene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenz(a,h)anthracene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenzofuran	1 U	1 U	1 U	NA	NA	1.8	1.7	2	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Diethyl phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Dimethyl phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-butyl phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-octyl phthalate	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Fluoranthene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Fluorene	1 U	1 U	1 U	NA	NA	2.2	2.1	2.9	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobenzene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobutadiene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorocyclopentadiene	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	5 U	5 U	5 UJ	NA	NA	NA
Hexachloroethane	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Isophorone	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Naphthalene	1 U	1 U	1 U	NA	NA	2.1	1.9	2.9	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Nitrobenzene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
N- Nitrosodimethylamine	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
N- Nitroso-Di-N-Propylamine	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
N- Nitrosodiphenylamine	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Pentachlorophenol	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Phenanthrene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Phenol	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Pyrene	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Pyridine	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	NA	NA	5 U	5 U	5 UJ	5 U	5 U	5 UJ	NA	NA	NA
PAHs (µg/L)																								
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	0.01 U	0.016	0.034	NA	NA	3.3	2.5	3.0	NA	NA	0.098	0.11	0.064	NA	NA	0.11	0.12	0.10	0.34	0.46	0.37	NA	NA	NA
Acenaphthylene	0.01 U	0.01 U	0.01 U	NA	NA	0.046	0.049 J	0.038	NA	NA	0.03	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Anthracene	0.01 U	0.01 U	0.01 U	NA	NA	0.12	0.14 J	0.080	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.015	0.028 J	0.016	0.034	0.059 J	0.041	NA	NA	NA
Benzo(a)anthracene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 J	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Benzo(a)pyrene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Benzo(b)fluoranthene	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	0.01 U	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Benzo(k)fluoranthene	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	NA	NA	0.01 U	NA	NA	0.01 U	NA	NA	NA	NA	NA
Chrysene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.010	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.014	0.015	0.011	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW05					MW06					MW07					MW08			MW09					MW09 (duplicate)
Sample Date	4/14/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/28/2013	8/17/2013	4/15/2010	7/14/2010	10/7/2010	3/26/2013	8/17/2013	4/14/2010	7/13/2010	10/7/2010	4/14/2010	7/13/2010	10/7/2010	3/26/2013	8/17/2013	3/26/2013
PAHs (µg/L) (Continued)																								
Dibenz(a,h)anthracene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.01 U	0.01 U	0.011	NA	NA	0.23	0.31 J	0.14	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.016	0.032 J	0.030	0.028	0.055 J	0.038	NA	NA	NA
Fluorene	0.01 U	0.01 U	0.012	NA	NA	2	1.8	1.8	NA	NA	0.014	0.023	0.011	NA	NA	0.091	0.096	0.058	0.24	0.37	0.29	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Naphthalene	0.01 U	0.018	0.038 U	NA	NA	1.8	1.4	1.8	NA	NA	0.013 U	0.031	0.022 U	NA	NA	0.073	0.083	0.087	0.06	0.1	0.074	NA	NA	NA
Phenanthrene	0.01 U	0.01 U	0.017	NA	NA	0.28	0.35	0.17	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.14	0.18	0.12	0.38	0.53	0.44	NA	NA	NA
Pyrene	0.01 U	0.01 U	0.012	NA	NA	0.14	0.18	0.093	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.019	0.035	0.031	0.044	0.06	0.042	NA	NA	NA
Total Benzofluoranthenes	NA	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 U	NA	0.01 U	0.01 U	NA	NA	NA
VOCs (µg/L)																								
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.3	0.2 U	0.2 U	0.3	0.2	0.3	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2-Dichlorobenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.3	0.3	0.2	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2	0.2	0.2	NA	NA	NA
1,2-Dichloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3,5-Trimethylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,4-Dichlorobenzene	0.2 U	0.2 U	0.2 U	NA	NA	3.7	3.6	3	NA	NA	0.2	0.2	0.2 U	NA	NA	1.5	1.6	1.7	0.4	0.4	0.5	NA	NA	NA
2-Butanone	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
2-Chloroethyl vinyl ether	1 U	R	R	NA	NA	1 U	R	R	NA	NA	R	R	1 U	NA	NA	1 U	R	R	1 U	R	1 U	NA	NA	NA
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	1.6	1.2	0.7	0.3	0.2	0.2	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA
Acetone	5.6	5 UJ	6.8	NA	NA	7	7.3 J	12	NA	NA	5 U	5 UJ	6.9	NA	NA	16	9.6 J	19	6.4	6.9 J	7.6	NA	NA	NA
Acrylonitrile	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	NA	NA	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA
Benzene	0.2 U	0.7 U	0.9 U	NA	NA	0.9	1.1 U	0.9 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.7	0.6 U	0.6 U	1.1	1 U	1.1	NA	NA	NA
Bromobenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromodichloromethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromoform	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromomethane	0.5 U	1 U	1 U	NA	NA	0.5 U	1 U	1 U	NA	NA	0.5 U	1 U	1 U	NA	NA	0.5 U	1 U	1 U	0.5 U	1 U	1 U	NA	NA	NA
Carbon disulfide	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chlorobenzene	0.2 U	0.2 U	0.2 U	NA	NA	11	12	8.8	NA	NA	3	2.2	2.2	NA	NA	0.3	0.2 U	0.4	1	1.1	1.1	NA	NA	NA
Chloroethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloroform	0.5	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloromethane	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	NA	NA	0.2	0.2 U	0.2	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Dibromochloromethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Dichlorodifluoromethane	0.2	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethyl ether	8.7	7.2	8.2	NA	NA	1	0.8	1.2	NA	NA	1.1	0.8	0.9	NA	NA	0.2	0.2 U	0.2	0.4	0.3	0.4	NA	NA	NA
Ethylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.3	0.2	0.3	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethylene dibromide	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Isopropylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.8	0.9	0.4	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
m,p-Xylene	0.4 U	0.4 U	0.4 U	NA	NA	0.4	0.4 U	0.4	NA	NA	0.4 U	0.4 U	0.4 U	NA	NA	0.5	0.4 U	0.4 U	0.4	0.4 U	0.5	NA	NA	NA
Methyl tert-butyl ether	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Methylene chloride	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
n-Butylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
n-Propylbenzene	0.2 U	0.2 UJ	0.2 U	NA	NA	0.2	0.2 UJ	0.2 U	NA	NA	0.2 U	0.2 UJ	0.2 U	NA	NA	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 UJ	0.2 U	NA	NA	NA
o-Xylene	0.2 U	0.2 U	0.2 U	NA	NA	0.2	0.2	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.3	0.2 U	0.2	0.2	0.2	0.3	NA	NA	NA
sec-Butylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.3 J	0.3	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Styrene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA

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Sample ID	MW05					MW06					MW07					MW08			MW09					MW09 (duplicate)
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VOCs (µg/L) (Continued)																								
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Tetrachloroethene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Toluene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.4 U	0.3 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.3	0.2 U	0.5 U	0.4	0.6 U	6.2	NA	NA	NA
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichloroethene	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Vinyl Chloride	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
PCBs (µg/L)																								
Aroclor 1016	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	NA	NA	NA
Aroclor 1221	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	NA	NA	NA
Aroclor 1232	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	NA	NA	NA
Aroclor 1242	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	NA	NA	NA
Aroclor 1248	0.01 U	0.04 U	0.025 U	NA	NA	0.017	0.025 U	0.025 U	NA	NA	0.025 U	0.025 U	0.01 U	NA	NA	0.015	0.015 U	0.04 U	0.15 U	0.45 U	1 U	NA	NA	NA
Aroclor 1254	0.01 U	0.05 U	0.01 U	NA	NA	0.01 U	0.015 U	0.01 U	NA	NA	0.01 U	0.02 U	0.01 U	NA	NA	0.01 U	0.015 U	0.015 U	0.01 U	0.15 U	0.25 U	NA	NA	NA
Aroclor 1260	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	NA	NA	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.1 U	NA	NA	NA
Total PCBs	0.01 U	0.05 U	0.025 U	NA	NA	0.017	0.025 U	0.025 U	NA	NA	0.025 U	0.025 U	0.01 U	NA	NA	0.015	0.015 U	0.04 U	0.15 U	0.45 U	1 U	NA	NA	NA
Pesticides (µg/L)																								
4,4'-DDD	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
4,4'-DDE	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0082 U	0.013 U	0.0058 U	NA	NA	NA
4,4'-DDT	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Aldrin	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0083 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.013 U	0.022 U	0.034 U	NA	NA	NA
alpha-Chlordane	0.00083 UJ	NA	NA	NA	NA	0.00083 U	NA	NA	NA	NA	0.0083 U	NA	NA	NA	NA	0.00083 U	NA	NA	0.00083 U	NA	NA	NA	NA	NA
alpha-BHC	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0083 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	NA	NA	NA
beta-BHC	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.013 U	0.0054	0.00083 U	NA	NA	0.0083 U	0.0022 J	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0024 U	0.0046 U	NA	NA	NA
cis-Chlordane	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	0.00083 U	0.00083 U	NA	NA	NA
delta-BHC	0.00083 UJ	0.00083 U	0.00083 UJ	NA	NA	0.00083 U	0.00083 U	0.00083 UJ	NA	NA	0.0083 U	0.00083 U	0.00083 UJ	NA	NA	0.00083 U	0.00083 U	0.00083 UJ	0.0014 U	0.00083 U	0.00083 UJ	NA	NA	NA
Dieldrin	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Endosulfan I	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0083 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0043 U	0.00083 U	NA	NA	NA
Endosulfan II	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Endosulfan sulfate	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Endrin	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Endrin aldehyde	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	NA	NA	NA
Endrin ketone	0.0017 UJ	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	NA	NA	0.017 U	0.0017 U	0.0017 U	NA	NA	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0037 U	NA	NA	NA
gamma-Chlordane	0.00083 UJ	NA	NA	NA	NA	0.00083 U	NA	NA	NA	NA	0.04 U	NA	NA	NA	NA	0.00083 U	NA	NA	0.0072 U	NA	NA	NA	NA	NA
gamma-BHC (Lindane)	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0083 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	NA	NA	NA
Heptachlor	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0083 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	NA	NA	NA
Heptachlor epoxide	0.00083 UJ	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.052 U	0.00083 U	0.00083 U	NA	NA	0.00083 U	0.00083 U	0.00083 U	0.0091 U	0.03 U	0.016 U	NA	NA	NA
Methoxychlor	0.0083 UJ	0.0083 U	0.0083 U	NA	NA	0.0083 U	0.0083 U	0.0083 U	NA	NA	0.083 U	0.0083 U	0.0083 U	NA	NA	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.0083 U	NA	NA	NA
Toxaphene	0.083 UJ	0.083 U	0.083 U	NA	NA	0.083 U	0.083 U	0.083 U	NA	NA	0.83 U	0.083 U	0.083 U	NA	NA	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	NA	NA	NA
trans-Chlordane	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	0.00083 U	0.00083 U	NA	0.011 U	0.028 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW10			MW11			MW11 (duplicate)			SP-01							SP-02						
Sample Date	4/15/2010	7/13/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/28/2009	7/23/2009	4/14/2010	7/15/2010	10/7/2010	10/15/2008	12/18/2008	4/28/2009	7/23/2009	4/15/2010	7/15/2010	10/7/2010
Dissolved Metals (µg/L)																							
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	60	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	50 U	NA	NA	NA
Antimony	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	50 U	NA	NA	NA
Arsenic	2.8	2.8	3	1.8	1.4	1.9	1.8	1.4	2	0.4	0.5 U	0.4 J-	1.2	0.4	1.2	1.2	2 U	0.5 U	0.7 J-	1.1	0.5 U	1.3	12
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	201	181	181 J-	267	NA	NA	NA	76	134	89 J-	160	NA	NA	NA
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	NA	NA	NA	2 U	1 U	1 UJ	1 U	NA	NA	NA
Cadmium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 U	NA	NA	NA	4 U	2 U	2 UJ	2 U	NA	NA	NA
Chromium	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U	NA	NA	NA	10 U	5 U	5 UJ	5 U	NA	NA	NA
Copper	2 U	3	2 U	2 U	2	2 U	2 U	3	2 U	2 U	2 U	2 UJ	2 U	NA	NA	NA	4 U	2 U	2 UJ	2 U	NA	NA	NA
Iron	11,300	13,800	13,900	10,600	11,100	13,000	10,800	11,100	12,200	50 U	50 U	50 UJ	12,300	NA	NA	NA	100 U	50 U	70 J-	18,200	NA	NA	NA
Lead	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U	1 U	10 U
Manganese	210	200	200	320	271	294	326	272	279	154	233	225 J-	173	NA	NA	NA	126	364	332 J-	321	NA	NA	NA
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	23	20 J-	16	NA	NA	NA	40	13	5 UJ	5 U	NA	NA	NA
Nickel	0.5 U	0.5 U	2	0.5 U	0.7	0.5 J+	0.7	0.5 U	1 U	0.6	0.6	0.7 J-	0.5 U	NA	NA	NA	7	3.5	0.8 J-	0.5 U	NA	NA	NA
Selenium	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	50 U	NA	NA	NA
Silver	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 UJ	3 U	NA	NA	NA	11	3 U	3 UJ	3 U	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA	319	398	315 J-	326	NA	NA	NA	3060	692	383 J-	397	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	2 U
Titanium	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA	10 U	5 U	5 UJ	5 U	NA	NA	NA
Vanadium	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 UJ	3 U	NA	NA	NA	6 U	3 U	3 UJ	3 U	NA	NA	NA
Zinc	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	NA	NA	NA	20 U	10 U	10 UJ	10 U	NA	NA	NA
Total Metals (µg/L)																							
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA	60	150	50 U	50 U	NA	NA	NA	270	2,230	680	900	NA	NA	NA
Antimony	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	NA	NA	100 U	50 U	50 U	50 U	NA	NA	NA
Arsenic	2.7	2.7	3	1.8	1.4	1.9	1.9	1.4	1.9	1.4	1.4	1.3	1.3	1.4	1.3	1.3	2 U	1.4	1.7	2.4	0.6	0.5	0.9
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA	300	279	251	258	NA	NA	NA	63	188	178	185	NA	NA	NA
Beryllium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	2 U	1 U	1 U	1 U	NA	NA	NA
Cadmium	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	NA	NA	NA	4 U	2 U	2 U	2 U	NA	NA	NA
Chromium	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 UJ	5 U	5 U	5 U	5 U	NA	NA	NA	10 U	5 U	5 U	5 U	NA	NA	NA
Copper	3	2	2 U	2	3	2 U	2	3	2 U	2 U	2 U	2 U	2 U	NA	NA	NA	4 U	5	2	2	NA	NA	NA
Iron	11,300	13,100	14,100	10,800	9,930	12,500	10,800	10,800	12,100	15,900	22,100	15,500	12,100	NA	NA	NA	5,890	21,400	25,100	26,400	NA	NA	NA
Lead	3	1 U	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1	1 U	1 U	1 U	1 U	1 U
Manganese	210	190	202	323	240	287	324	264	284	173	251	238	163	NA	NA	NA	85	409	373	314	NA	NA	NA
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA	21	24	20	15	NA	NA	NA	40	14	5 U	5 U	NA	NA	NA
Nickel	0.8 J	0.6	2.4	2.4 J	0.5 U	0.5	1.2 J	0.5 U	0.5	1.9	1	0.8	0.5 U	NA	NA	NA	8	5.4	2.4	2.7	NA	NA	NA
Selenium	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	NA	NA	NA	100 U	50 U	50 U	50 U	NA	NA	NA
Silver	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	NA	NA	NA	8	3 U	3 U	3 U	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA	332	419	320	296	NA	NA	NA	3,830	787	407	377	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Titanium	NA	NA	NA	NA	NA	NA	NA	NA	NA	5 U	14	5	5	NA	NA	NA	20	128	41	54	NA	NA	NA
Vanadium	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	NA	NA	NA	6 U	7	5	5	NA	NA	NA
Zinc	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	NA	NA	NA	20 U	10 U	10 U	10 U	NA	NA	NA
TPH (mg/L)																							
Gasoline Range Organics	0.25 U	0.25 U	0.25 U	0.48	0.57	0.35	0.49	0.57	0.63	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA
Diesel Range Organics	0.25 U	0.13	0.1 U	1.2 J	0.77 J	0.27	0.84 J	0.56 J	0.32	0.44	0.56	0.65	0.74	0.25 U	0.1 U	0.1 U	0.25 U	0.31	0.33	0.51	0.25 UJ	0.1 U	0.1 U
Lube Oil	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.2 U	0.2 U
SVOCs (µg/L)																							
1-Methylnaphthalene	1 U	1 U	1 U	2.8	2.8	3.1	2.7	2.8	2.6	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,4,5-Trichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dimethylphenol	1 U	1 U	1 U	**640**	120	140	**650**	120	110	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,4-Dinitrophenol	10 U	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 UJ	10 U	10 U	R	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2-Chloronaphthalene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Chlorophenol	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylnaphthalene	1 U	1 U	1 U	2.3	2	2.1	2.3	2	1.8	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylphenol	1 U	1 U	1 U	120	17	19	120	17	17	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Nitroaniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2-Nitrophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 UJ	5 U	5 UJ	5 UJ	5 U	5 UJ	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW10			MW11			MW11 (duplicate)			SP-01							SP-02						
Sample Date	4/15/2010	7/13/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/28/2009	7/23/2009	4/14/2010	7/15/2010	10/7/2010	10/15/2008	12/18/2008	4/28/2009	7/23/2009	4/15/2010	7/15/2010	10/7/2010
SVOCs (µg/L) (Continued)																							
3-Nitroaniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	R	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA
4-Bromophenyl phenyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Chloro-3-methylphenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	7.8 J	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chloroaniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chlorophenyl phenyl ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Methylphenol	1 U	1 U	1 U	280	34	32	280	35	27	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Nitroaniline	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Nitrophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Acenaphthene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Acenaphthylene	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 UJ	1 U	1 UJ	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Aniline	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Anthracene	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 UJ	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzidine	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 U	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA
Benzo(a)anthracene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(a)pyrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(b)fluoranthene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(g,h,i)perylene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(k)fluoranthene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzoic acid	10 U	10 U	10 U	62 J	10 U	10 U	60	10 U	10 U	10 U	R	10 U	10 U	NA	NA	NA	10 U	R	10 U	10 U	NA	NA	NA
Benzyl alcohol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
bis(2-Chloroethoxy)methane	1 U	1 U	1 U	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
bis-(2-Chloroethyl)ether	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
bis(2-Ethylhexyl) phthalate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Butyl benzyl phthalate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.9 J	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Carbaryl (Sevin)	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	1.9	3.5 J	2.6	11	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Carbazole	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Chrysene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenz(a,h)anthracene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenzofuran	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Diethyl phthalate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dimethyl phthalate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-butyl phthalate	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-octyl phthalate	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Fluoranthene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Fluorene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobenzene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobutadiene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorocyclopentadiene	5 U	5 U	5 UJ	5 U	5 U	5 UJ	5 U	5 U	5 UJ	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Hexachloroethane	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Isophorone	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 UJ	1 U	1 UJ	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Naphthalene	1 U	1 U	1 U	2.2	1.2	1.4	2.1	1.3	1.2	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Nitrobenzene	1 U	1 U	1 U	82 U	1 U	1 U	79 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
N-Nitrosodimethylamine	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
N-Nitroso-Di-N-Propylamine	1 U	1 U	1 U	1 UJ	1 U	1 UJ	1 UJ	1 U	1 UJ	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
N-Nitrosodiphenylamine	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U	5 UJ	1 U	R	1 U	1 U	NA	NA	NA	1 U	1.4 J	1.2	1.2	NA	NA	NA
Pentachlorophenol	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Phenanthrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Phenol	1 U	1 U	1 U	8.6	1.2	1.6	8.4	1.2	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Pyrene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	R	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Pyridine	5 U	5 U	5 UJ	5 UJ	5 U	5 UJ	5 UJ	5 U	5 UJ	5 U	R	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
PAHs (µg/L)																							
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.38 J	NA	0.32	NA	NA	NA	NA	0.088 J	NA	0.11	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.36 J	NA	0.28	NA	NA	NA	NA	0.024 J	NA	0.03	NA	NA	NA
Acenaphthene	0.14	0.18	0.14	0.31 J	0.34	0.34	0.29 J	0.35	0.28	0.32	0.37 J	0.38	0.38	NA	NA	NA	0.081	0.18 J	0.18	0.14	NA	NA	NA
Acenaphthylene	0.01 U	0.01 U	0.01 U	0.1 U	0.046 J	0.039 J	0.05 U	0.047 J	0.032 J	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Anthracene	0.023	0.01 U	0.01 U	0.1 U	0.019 J	0.01 U	0.05 U	0.028 J	0.01 U	0.024	0.029 J	0.022	0.028	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(a)anthracene	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.05 U	0.012 J	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(a)pyrene	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 U	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(b)fluoranthene	0.01 U	NA	NA	0.1 UJ	NA	NA	0.05 UJ	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(g,h,i)perylene	0.01 U	0.01 U	0.01 U	0.1 UJ	0.01 U	0.01 U	0.05 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(k)fluoranthene	0.01 U	NA	NA	0.1 U	NA	NA	0.05 U	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Chrysene	0.01 U	0.01 U	0.01 U	0.1 U	0.01 U	0.01 U	0.05 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW10			MW11			MW11 (duplicate)			SP-01							SP-02						
Sample Date	4/15/2010	7/13/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	4/15/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/28/2009	7/23/2009	4/14/2010	7/15/2010	10/7/2010	10/15/2008	12/18/2008	4/28/2009	7/23/2009	4/15/2010	7/15/2010	10/7/2010
PAHs (µg/L) (Continued)																							
Dibenz(a,h)anthracene	0.01 U	0.01 U	0.01 U	0.1 UJ	0.01 U	0.01 U	0.05 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.12 J	NA	0.12	NA	NA	NA	NA	0.039 J	NA	0.031	NA	NA	NA
Fluoranthene	0.01 U	0.01 U	0.01 U	0.1 U	0.029 J	0.031 J	0.091	0.021 J	0.024 J	0.028	0.037 J	0.036	0.035	NA	NA	NA	0.01 U	0.026 J	0.021	0.02	NA	NA	NA
Fluorene	0.05	0.071	0.052	0.37	0.46	0.44	0.35	0.5	0.37	0.18	0.24 J	0.21	0.2	NA	NA	NA	0.058	0.12 J	0.1	0.08	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.01 U	0.01 U	0.01 U	0.1 UJ	0.01 U	0.01 U	0.05 UJ	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Naphthalene	0.097	0.11	0.093	1.4 J	1 J	0.56	1.1 J	0.94 J	0.55	0.25	0.57 J	0.62	0.28	NA	NA	NA	0.032 U	0.038 J	0.049 U	0.052 U	NA	NA	NA
Phenanthrene	0.021	0.029	0.024	0.21	0.12	0.098 J	0.2	0.12	0.090 J	0.11	0.11 J	0.15	0.21	NA	NA	NA	0.019	0.035 J	0.026	0.032	NA	NA	NA
Pyrene	0.01 U	0.01 U	0.01 U	0.1 U	0.026	0.023 J	0.05 U	0.033	0.019 J	0.024	0.031 J	0.028	0.03	NA	NA	NA	0.012	0.03 J	0.024	0.028	NA	NA	NA
Total Benzofluoranthenes	NA	0.01 U	0.01 U	NA	0.01 U	0.01 U	NA	0.014	0.01 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (µg/L)																							
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trimethylbenzene	1	0.8	0.7	6.6	4.2	4	6.5	4.4	4.1	0.8	0.4	0.5	1.1	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.4	0.4	0.3 J	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3,5-Trimethylbenzene	0.2	0.2 U	0.2 U	1.4	0.9	0.8	1.4	0.9	0.8	0.2 U	0.2 U	0.2 U	0.3	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,4-Dichlorobenzene	0.2	0.2	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.7	0.8	0.6	0.6 J	NA	NA	NA	0.2 U	0.3	0.2	0.3 J	NA	NA	NA
2-Butanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U	5.9	5 U	NA	NA	NA	2.5 U	2.5 U	3.5	5 U	NA	NA	NA
2-Chloroethyl vinyl ether	R	R	1 U	R	R	R	R	R	R	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.4 J	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
2-Hexanone	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	0.6	0.4	0.3	0.6	0.3	0.3	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA
Acetone	5 U	5 UJ	7	5 U	5 J	5.7	5 U	5 UJ	6	4.7	5.3 U	10 U	5 U	NA	NA	NA	6.9	8.9 U	14 U	5 U	NA	NA	NA
Acrylonitrile	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzene	2.5 U	2.2 U	2.7	8.3	3.7	6.4	8.6	3.9	5.9	2.6	2.4	1.9	2.2	NA	NA	NA	0.4	0.2 U	0.3	0.2	NA	NA	NA
Bromobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromodichloromethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromoform	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromomethane	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	1 U	1 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	7.6	8.2	5.7	6.8	NA	NA	NA	0.3	0.7	0.6	0.8	NA	NA	NA
Chloroethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloroform	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Dibromochloromethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Dichlorodifluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethyl ether	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.14 J	NA	0.14 J	0.15 J	NA	NA	NA	0.2 J	NA	0.42 J	0.56 J	NA	NA	NA
Ethylbenzene	0.2 U	0.2 U	0.2 U	3.1	1.3	1.8	3.2	1.3	1.6	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethylene dibromide	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.3	0.2	0.2 U	0.3	0.2	0.2	0.2	0.2 U	0.2 U	0.2	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
m,p-Xylene	2	1.6	1.8	11	6.4	7.4	11	6.6	7.4	1.9	1.5	1.2	2.2	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA
Methyl tert-butyl ether	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA
Methylene chloride	0.5 U	0.5 U	0.7	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
n-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.2	0.4	0.3	0.2	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
n-Propylbenzene	0.2 U	0.2 UJ	0.2 U	0.7	0.3 J	0.4	0.7	0.4 J	0.4	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
o-Xylene	3	2.4	2.8	5.9	3.7	4.4	6	3.8	4.3	2.7	1.7	1.6	3.1	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
sec-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Styrene	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 UJ	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	MW10			MW11			MW11 (duplicate)			SP-01							SP-02						
Sample Date	**4/15/2010**	**7/13/2010**	**10/7/2010**	**4/15/2010**	**7/14/2010**	**10/7/2010**	**4/15/2010**	**7/14/2010**	**10/7/2010**	**10/15/2008**	**12/17/2008**	**4/28/2009**	**7/23/2009**	**4/14/2010**	**7/15/2010**	**10/7/2010**	**10/15/2008**	**12/18/2008**	**4/28/2009**	**7/23/2009**	**4/15/2010**	**7/15/2010**	**10/7/2010**
VOCs (µg/L) (Continued)																							
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Tetrachloroethene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Toluene	2.6 U	2.2 U	2.6	20	8	12	20	8.1	11	1.8	1.4	1.3	1.7	NA	NA	NA	0.6 U	0.2 U	0.3	0.2 U	NA	NA	NA
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Vinyl Chloride	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
PCBs (µg/L)																							
Aroclor 1016	1 U	1 U	5 U	1 U	1 U	10 U	1 U	1 U	10 U	0.01 U	0.2 UJ	0.1 U	0.3 U	0.5 U	0.1 U	1 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1221	1 U	1 U	5 U	1 U	1 U	10 U	1 U	1 U	10 U	0.01 U	0.2 UJ	0.1 U	0.3 U	0.5 U	0.1 U	1 U	0.01 U	0.01 UJ	0.01 U	0.05 U	0.01 U	0.01 U	0.01 U
Aroclor 1232	1 U	1 U	5 U	1 U	1 U	10 U	1 U	1 U	10 U	0.01 U	0.2 UJ	0.1 U	0.3 U	0.5 U	0.1 U	1 U	0.01 U	0.02 UJ	0.028	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1242	1 U	1 U	5 U	1 U	1 U	10 U	1 U	1 U	10 U	0.15 U	0.2 UJ	0.1 U	0.3 U	0.5 U	0.1 U	1 U	0.015 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1248	50 U	30 U	62 U	120 U	100 U	150 U	150 U	100 U	150 U	0.01 U	10 UJ	5 U	12 U	18 U	4.5 U	20 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.015 U	0.05 U	0.01 U
Aroclor 1254	5 U	15 U	5 U	5 U	25 U	50 U	10 U	25 U	50 U	0.25 U	1 UJ	2 U	1.2 U	0.5 U	2.5 U	1 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.25 U	0.01 U
Aroclor 1260	1 U	1 U	5 U	1 U	1 U	10 U	1 U	1 U	10 U	0.01 U	0.2 UJ	0.1 U	0.3 U	0.5 U	0.1 U	1 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total PCBs	50 U	30 U	62 U	120 U	100 U	150 U	150 U	100 U	150 U	0.25 U	10 UJ	5 U	12 U	18 U	4.5 U	20 U	0.015 U	0.02 UJ	0.028	0.05 U	0.015 U	0.25 U	0.01 U
Pesticides (µg/L)																							
4,4'-DDD	0.017 U	**0.0058 J**	0.017 U	0.12 U	0.034 U	0.28 UJ	0.062 U	0.04 U	0.017 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
4,4'-DDE	**0.16**	**0.058 J**	0.094 U	2 U	**0.34 J**	0.017 UJ	1.2 U	**0.32 J**	0.35 UJ	0.06 U	0.17 UJ	0.083 U	0.17 U	0.11 U	**0.082 J**	0.073 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
4,4'-DDT	0.017 U	0.0017 UJ	0.017 U	0.17 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Aldrin	0.35 U	0.00083 UJ	1.5 U	0.083 U	0.083 U	1.9 UJ	0.06 U	0.083 U	1.6 UJ	0.0017 U	1.2 UJ	0.042 U	0.083 U	0.095 U	0.13 U	0.21 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
alpha-Chlordane	0.0083 U	NA	NA	0.0083 U	NA	NA	0.0083 U	NA	NA	0.0017 U	0.083 UJ	0.042 U	0.083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	NA	NA
alpha-BHC	0.0083 U	0.00083 UJ	0.0083 U	0.043 U	0.0083 U	0.035 UJ	0.022 U	0.0083 U	0.024 UJ	0.0017 U	0.083 UJ	0.042 U	0.083 U	0.0034 U	0.0083 U	0.0083 U	0.0017 U	0.0017 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
beta-BHC	0.0083 U	0.00083 UJ	0.0083 U	0.083 U	0.069 U	0.063 UJ	0.083 U	0.083 U	0.055 UJ	0.0048 U	0.083 UJ	0.042 U	0.083 U	0.0056 U	0.0083 U	0.0083 U	0.0017 U	0.0029 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
cis-Chlordane	NA	0.00083 UJ	0.0083 U	NA	0.0083 U	0.79 UJ	NA	0.0083 U	0.62 UJ	NA	NA	NA	NA	NA	0.0083 U	0.0083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U
delta-BHC	0.0083 U	0.0024 UJ	0.0083 UJ	0.083 U	0.052 U	0.065 UJ	0.059 U	0.06 U	0.063 UJ	0.0017 U	0.083 UJ	0.042 U	0.083 U	0.0025 U	0.0083 U	0.0083 UJ	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 UJ
Dieldrin	0.017 U	0.0017 UJ	0.017 U	2 U	0.017 U	0.41 UJ	1.2 U	0.017 U	0.41 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.058 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endosulfan I	0.0083 U	0.09 UJ	0.085 U	0.083 U	0.083 U	0.17 UJ	0.38 U	0.083 U	0.12 UJ	0.0039 U	0.083 UJ	0.042 U	0.083 U	0.028 U	0.037 U	0.012 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
Endosulfan II	0.017 U	0.0017 UJ	0.017 U	0.077 U	0.028 U	0.046 UJ	0.058 U	0.03 U	0.043 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endosulfan sulfate	0.017 U	0.0017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endrin	0.017 U	0.0017 UJ	0.017 U	0.017 U	0.017 U	0.062 UJ	0.17 U	0.017 U	0.028 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endrin aldehyde	0.017 U	0.0017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
Endrin ketone	0.017 U	0.0017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.0033 U	0.17 UJ	0.083 U	0.17 U	0.0016 U	0.017 U	0.017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U
gamma-Chlordane	0.28 U	NA	NA	0.0083 U	NA	NA	0.083 U	NA	NA	0.0017 U	0.23 UJ	0.042 U	0.16 U	0.031 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	NA	NA
gamma-BHC (Lindane)	0.0083 U	0.00083 UJ	0.0083 U	0.083 U	0.083 U	0.44 UJ	0.083 U	0.083 U	0.54 UJ	0.0017 U	0.083 UJ	0.042 U	0.083 U	0.0008 U	0.0083 U	0.0083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
Heptachlor	0.0083 U	0.00083 UJ	0.0083 U	0.31 U	0.083 U	0.47 UJ	0.05 U	0.083 U	0.48 UJ	0.0017 U	0.083 UJ	0.042 U	0.083 U	0.081 U	0.0083 U	0.0083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
Heptachlor epoxide	0.64 U	0.3 UJ	0.3 U	0.29 U	0.083 U	0.67 UJ	0.077 U	0.083 U	0.54 UJ	0.052 U	0.44 UJ	0.32 U	0.39 U	0.11 U	0.16 U	0.21 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U
Methoxychlor	0.083 U	0.0083 UJ	0.083 U	0.083 U	0.083 U	0.083 UJ	0.083 U	0.083 U	0.083 UJ	0.017 U	0.83 UJ	0.42 U	0.83 U	0.008 U	0.083 U	0.083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.0083 U
Toxaphene	0.83 U	0.083 UJ	0.83 U	0.83 U	0.83 U	0.83 UJ	0.83 U	0.83 U	0.83 UJ	0.26 U	8.3 UJ	4.2 U	8.3 U	0.08 U	0.83 U	0.83 U	0.17 U	0.083 UJ	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U
trans-Chlordane	NA	0.25 UJ	0.22 U	NA	0.0083 U	0.58 UJ	NA	0.0083 U	0.43 UJ	NA	NA	NA	NA	NA	0.11 U	0.12 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SP-03							SW-01							SW-03						
Sample Date	10/15/2008	12/15/2008	4/28/2009	7/24/2009	4/15/2010	7/15/2010	10/7/2010	10/14/2008	12/14/2008	4/28/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010
Dissolved Metals (µg/L)																					
Aluminum	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	70	50 U	50 UJ	50 U	NA	NA	NA
Antimony	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA
Arsenic	0.8	0.5 U	0.6 J-	0.8	0.5 U	0.5 U	0.8	3.2	2.4	2.9 J-	5.1	2.4	3.8	4.1	1.1	5 U	1.8 J-	1.8	1.3	3.8	1.1
Barium	63	61	72 J-	104	NA	NA	NA	9	6	8 J-	18	NA	NA	NA	3 U	26	10 J-	5	NA	NA	NA
Beryllium	1 U	1 U	1 UJ	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U	NA	NA	NA
Cadmium	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA
Chromium	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA
Copper	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA	2 U	3	2 UJ	2	NA	NA	NA
Iron	50 U	50 U	3,940 J-	25,800	NA	NA	NA	50 U	120	50 UJ	320	NA	NA	NA	530	60	370 J-	370	NA	NA	NA
Lead	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	5 U	1 UJ	1 U	1 U	1 U	1 U
Manganese	434	477	545 J-	444	NA	NA	NA	13	22	391 J-	150	NA	NA	NA	203	335	159 J-	180	NA	NA	NA
Mercury	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U
Molybdenum	17	12	5 UJ-	5 U	NA	NA	NA	15	6	5 UJ	5 U	NA	NA	NA	15	20	6 J-	5 U	NA	NA	NA
Nickel	2.4	2.7	0.6 J-	0.6	NA	NA	NA	4.5	3.4	5.8 J-	3.6	NA	NA	NA	3	9	5.1 J-	3.8	NA	NA	NA
Selenium	50 U	50 U	50 UJ-	50	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA
Silver	3 U	3 U	3 UJ-	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA
Strontium	414	582	408 J-	474	NA	NA	NA	196	92	154 J-	196	NA	NA	NA	263	2770	351 J-	800	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 UJ-	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U
Titanium	5 U	5 U	5 UJ-	5 U	NA	NA	NA	5 U	5	5 UJ	5 U	NA	NA	NA	5 U	9	5 UJ	7	NA	NA	NA
Vanadium	3 U	3 U	3 UJ-	3 U	NA	NA	NA	3 U	3 U	3 UJ	3	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA
Zinc	10 U	10 U	10 UJ-	10 U	NA	NA	NA	10 U	10 U	10 UJ	10 U	NA	NA	NA	10 U	10 U	10 UJ	10 U	NA	NA	NA
Total Metals (µg/L)																					
Aluminum	580	50	50 U	80	NA	NA	NA	170	650	440	13,200	NA	NA	NA	290	100	3,080	140	NA	NA	NA
Antimony	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA
Arsenic	1.3	0.5 U	1.1	0.8	0.9	1.5	2.2	4.8	5.8	5	21.3 J	6.6	20.1	6.5	2.2	2 U	3	2.5 J	2	11	1.7
Barium	206	89	165	100	NA	NA	NA	12	13	15	86	NA	NA	NA	7	27	31	7	NA	NA	NA
Beryllium	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Cadmium	2 U	2 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA	NA
Chromium	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	31	NA	NA	NA	5 U	5 U	8	5 U	NA	NA	NA
Copper	2 U	2 U	2 U	2 U	NA	NA	NA	2 U	5	2	38	NA	NA	NA	2 U	4	10	3	NA	NA	NA
Iron	55,300	19,800	41,100	25,400	NA	NA	NA	800	1610	890	16,500	NA	NA	NA	1,790	650	7,920	1,360	NA	NA	NA
Lead	1 U	1 U	1 U	1 U	1 U	1 U	1	1 U	2	1 U	24	2	9	1 U	1 U	5 U	3	1 U	1 U	13	1 U
Manganese	557	495	570	395	NA	NA	NA	50	660	414	313	NA	NA	NA	230	353	276	195	NA	NA	NA
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.0284	0.02 U	0.0649	0.02 U	0.0215	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.071	0.02 U
Molybdenum	8	13	5 U	5 U	NA	NA	NA	10	6	5 U	9	NA	NA	NA	7	22	6	5 U	NA	NA	NA
Nickel	3.2	1.2	0.9	1	NA	NA	NA	5.2	8.1	7.4	72.2 J	NA	NA	NA	4.2	9	12.6	4.6 J	NA	NA	NA
Selenium	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA
Silver	3 U	3 U	3 U	3 U	NA	NA	NA	3 U	3 U	3 U	3 U	NA	NA	NA	3 U	3 U	3 U	3 U	NA	NA	NA
Strontium	452	603	424	407	NA	NA	NA	196	100	164	217	NA	NA	NA	265	2,900	381	820	NA	NA	NA
Thallium	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U	0.2 U	1 U	0.2 U	0.2 UJ	0.2 U	0.2 U	0.2 U
Titanium	31	7	8	11	NA	NA	NA	10	44	28	777	NA	NA	NA	19	18	156	16	NA	NA	NA
Vanadium	8	3 U	3	3 U	NA	NA	NA	5	5	4	76	NA	NA	NA	3 U	3 U	11	3	NA	NA	NA
Zinc	20	10 U	10 U	10 U	NA	NA	NA	10 U	10	10 U	150	NA	NA	NA	10 U	10 U	20	10 U	NA	NA	NA
TPH (mg/L)																					
Gasoline Range Organics	0.25 U	0.25 U	0.25 U	0.25 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	0.4	0.55	0.64	0.76	0.25 UJ	0.1 U	0.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.2 U	0.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (µg/L)																					
1-Methylnaphthalene	4	5.2	5.3	3.6	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,2'-Oxybis(1-chloropropane)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,4,5-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,4-Dimethylphenol	1 U	57	13	1.9	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2-Chloronaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Chlorophenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylnaphthalene	2.9	4.4	4.2	3.6	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
2-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SP-03							SW-01							SW-03						
Sample Date	10/15/2008	12/15/2008	4/28/2009	7/24/2009	4/15/2010	7/15/2010	10/7/2010	10/14/2008	12/14/2008	4/28/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010
SVOCs (µg/L) (Continued)																					
3-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA
4-Bromophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Chloro-3-methylphenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chloroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Chlorophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
4-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
4-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Acenaphthene	1	1.3	1.2	1.1	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Acenaphthylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Aniline	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzidine	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA
Benzo(a)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(a)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(b)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(g,h,i)perylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzo(k)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzoic acid	10 U	R	10 U	10 U	NA	NA	NA	10 U	R	10 U	10 U	NA	NA	NA	10 U	R	10 U	10 U	NA	NA	NA
Benzyl alcohol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
bis(2-Chloroethoxy)methane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
bis-(2-Chloroethyl)ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
bis(2-Ethylhexyl) phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1.5 U	1.6	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Butyl benzyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Carbaryl (Sevin)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Carbazole	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Chrysene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenz(a,h)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dibenzofuran	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Diethyl phthalate	1 U	1.4	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Dimethyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-butyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Di-n-octyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Fluorene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorobutadiene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Hexachloroethane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Isophorone	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Naphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Nitrobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
N-Nitrosodimethylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
N-Nitroso-Di-N-Propylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
N-Nitrosodiphenylamine	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Pentachlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
Phenanthrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Phenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Pyridine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA
PAHs (µg/L)																					
1-Methylnaphthalene	NA	2.8 J	NA	2.8	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA
2-Methylnaphthalene	NA	2.8 J	NA	2.5	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA
Acenaphthene	0.86	0.89 J	1.1	0.91	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Acenaphthylene	0.029	0.026 J	0.022 J	0.021 J	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Anthracene	0.044	0.059 J	0.047	0.046	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(a)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(a)pyrene	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(b)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(g,h,i)perylene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.022	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Benzo(k)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Chrysene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.014	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SP-03							SW-01							SW-03						
Sample Date	10/15/2008	12/15/2008	4/28/2009	7/24/2009	4/15/2010	7/15/2010	10/7/2010	10/14/2008	12/14/2008	4/28/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/24/2009	4/13/2010	7/12/2010	10/7/2010
PAHs (µg/L) (Continued)																					
Dibenz(a,h)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Dibenzofuran	NA	0.3 J	NA	0.31	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA
Fluoranthene	0.064	0.07 J	0.087	0.064	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.011	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Fluorene	0.51	0.62 J	0.61	0.49	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Naphthalene	0.21 U	0.11 J	0.18	0.13 U	NA	NA	NA	0.014 U	0.01 UJ	0.022 U	0.01 U	NA	NA	NA	0.011 U	0.014 UJ	0.01 U	0.01 U	NA	NA	NA
Phenanthrene	0.4	0.42 J	0.52	0.43	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.011	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Pyrene	0.05	0.051 J	0.057	0.045	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.013	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA
Total Benzofluoranthenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (µg/L)																					
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,1-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
1,2-Dichlorobenzene	0.3	0.3	0.3	0.3 J	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3,5-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
1,4-Dichlorobenzene	1.7	2	1.8	1.6 J	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
2-Butanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA
2-Chloroethyl vinyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
2-Hexanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
4-Methyl-2-pentanone (MIBK)	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA
Acetone	12	20 U	9.6 U	5 U	NA	NA	NA	3 U	3.5 U	2.5 U	5 U	NA	NA	NA	3.1	7.2 U	4.7 U	5 U	NA	NA	NA
Acrylonitrile	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA
Benzene	0.8	0.8	0.8	0.6	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromodichloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Bromoform	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	17	NA	NA	NA
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	4.1	NA	NA	NA	0.2 U	0.2 U	0.2	0.2 U	NA	NA	NA
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chlorobenzene	4.1	4.5	4	3.9	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloroethane	0.4	0.4	0.3	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloroform	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Chloromethane	0.2 U	0.2	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Dibromochloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.3	NA	NA	NA
Dichlorodifluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethyl ether	0.84 J	NA	0.87 J	0.79 J	NA	NA	NA	1 U	NA	1 U	1 U	NA	NA	NA	1 U	NA	1 U	1 U	NA	NA	NA
Ethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Ethylene dibromide	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
m,p-Xylene	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA
Methyl tert-butyl ether	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA
n-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
n-Propylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
sec-Butylbenzene	0.2	0.2 U	0.2	0.2	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Styrene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA

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Sample ID	SP-03							SW-01							SW-03						
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VOCs (µg/L) (Continued)																					
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Tetrachloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Toluene	0.3 U	0.2 U	0.3	0.2 U	NA	NA	NA	0.2 U	0.4	0.2 U	32	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
Vinyl Chloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA
PCBs (µg/L)																					
Aroclor 1016	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1221	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.05 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.015 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1232	0.01 U	0.086 J	0.091	0.1 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1242	0.035 J	0.029 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.02 U
Aroclor 1248	0.01 U	0.01 UJ	0.01 U	0.01 U	0.017 J	0.035 U	0.03 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.025 U	0.01 U
Aroclor 1254	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.025 U	0.015 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Aroclor 1260	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total PCBs	0.035 J	**0.115**	**0.091**	0.1 U	0.017 J	0.035 U	0.03 U	0.01 U	0.05 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.015 UJ	0.01 U	0.01 U	0.01 U	0.025 U	0.02 U
Pesticides (µg/L)																					
4,4'-DDD	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
4,4'-DDE	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
4,4'-DDT	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Aldrin	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U
alpha-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA
alpha-BHC	0.0017 U	0.0034 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.0023 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U
beta-BHC	0.0017 U	0.0065 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.01 U	0.00083 U
cis-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U
delta-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 UJ	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 UJ	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U
Dieldrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Endosulfan I	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U
Endosulfan II	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Endosulfan sulfate	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Endrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Endrin aldehyde	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
Endrin ketone	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U
gamma-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.0049 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA
gamma-BHC (Lindane)	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0017	0.00083 U	0.00083 U
Heptachlor	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.0049 U	0.00083 U
Heptachlor epoxide	0.0017 U	0.00083 UJ	0.0013 U	0.00083 U	0.00083 U	0.00083 U	0.001 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.00091 U	0.00083 U	0.00083 U
Methoxychlor	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.0083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U
Toxaphene	0.17 U	0.083 UJ	0.083 U	0.083 U	0.083 U	0.083 U	0.083 U	0.17 U	0.083 UJ	0.083 U	0.33 U	0.08 U	0.083 U	0.083 U	0.17 U	0.083 UJ	0.083 U	0.083 U	0.32 U	0.083 U	0.083 U
trans-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SW-04							SW-05							SW-06							SW-07	
Sample Date	10/15/2008	12/18/2008	4/29/2009	7/24/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/6/2010	12/17/2008	4/28/2009
Dissolved Metals (µg/L)																							
Aluminum	50 U	100 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	100 U	NA	NA	NA	50 U	50 UJ
Antimony	50 U	100 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	100 U	NA	NA	NA	50 U	50 UJ
Arsenic	2	2 U	2 J-	3	1.4	4.6	1.6	1 U	1 U	1.7 J-	3	0.6	2.5	1.3	3	5 U	4 J-	5	1	3	2	0.5	0.6 J-
Barium	4	33	11 J-	12	NA	NA	NA	13	18	22 J-	20	NA	NA	NA	11	18	14 J-	12	NA	NA	NA	43	71 J-
Beryllium	1 U	2 U	1 UJ	1 U	NA	NA	NA	1 U	1 U	1 UJ	1 U	NA	NA	NA	2 U	1 U	1 UJ	2 U	NA	NA	NA	1 U	1 UJ
Cadmium	2 U	4 U	2 UJ	2 U	NA	NA	NA	2 U	2 U	2 UJ	2 U	NA	NA	NA	4 U	2 U	2 UJ	4 U	NA	NA	NA	2 U	2 UJ
Chromium	5 U	10 U	5 UJ	5 U	NA	NA	NA	5 U	5 U	5 UJ	5 U	NA	NA	NA	10 U	5 U	5 UJ	10 U	NA	NA	NA	5 U	5 UJ
Copper	2 U	5	3 J-	3	NA	NA	NA	2 U	3	2 J-	4	NA	NA	NA	4 U	3	3 J-	6	NA	NA	NA	2 U	2 UJ
Iron	280	100 U	170 J-	180	NA	NA	NA	50 U	300	50 UJ	70	NA	NA	NA	100 U	50 U	50 UJ	100 U	NA	NA	NA	50 U	50 UJ
Lead	1 U	5 U	2 UJ	2 U	1 U	1 U	1 U	1 U	2 U	1 UJ	5 U	1 U	1 U	1 U	5 U	5 U	5 UJ	5 U	1 U	5 U	2 U	1 U	1 UJ
Manganese	68	246	164 J-	55	NA	NA	NA	345	227	795 J-	75	NA	NA	NA	80	132	289 J-	32	NA	NA	NA	229	169 J-
Mercury	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 UJ
Molybdenum	13	40	7 J-	5 U	NA	NA	NA	21	13	5 UJ	5	NA	NA	NA	40	20	8 J-	10 U	NA	NA	NA	24	19 J-
Nickel	2.6	11	5 J-	5	NA	NA	NA	5.8	3	4 J-	6	NA	NA	NA	8	7	6 J-	7	NA	NA	NA	4	1.7 J-
Selenium	50 U	100 U	50 UJ	50 U	NA	NA	NA	50 U	50 U	50 UJ	50 U	NA	NA	NA	100 U	50 U	50 UJ	100 U	NA	NA	NA	50 U	50 UJ
Silver	3 U	6 U	3 UJ	3 U	NA	NA	NA	3 U	3 U	3 UJ	3 U	NA	NA	NA	8	3 U	3 UJ	6 U	NA	NA	NA	3 U	3 UJ
Strontium	425	3750	802 J-	1740	NA	NA	NA	1,340	729	621 J-	2,480	NA	NA	NA	3,630	2,470	1,860 J-	3,650	NA	NA	NA	280	327 J-
Thallium	0.2 U	1 U	0.5 UJ	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 UJ	1 U	0.2 U	0.2 U	0.2 U	1 U	1 U	1 UJ	1 U	0.2 U	1 U	0.5 U	0.2 U	0.2 UJ
Titanium	5 U	10 U	5 UJ	7	NA	NA	NA	5 U	5 U	5 UJ	6	NA	NA	NA	10 U	7	7 J-	10	NA	NA	NA	5 U	5 UJ
Vanadium	3 U	6 U	3 J-	4	NA	NA	NA	3 U	3 U	3 UJ	4	NA	NA	NA	6 U	3 U	4 J-	6 U	NA	NA	NA	3 U	3 UJ
Zinc	10 U	20 U	10 UJ	10 U	NA	NA	NA	10 U	20	10 UJ	10 U	NA	NA	NA	20 U	10 U	10 UJ	20 U	NA	NA	NA	10 U	10 UJ
Total Metals (µg/L)																							
Aluminum	1,570	4,240	440	1,090	NA	NA	NA	120	400	190	90	NA	NA	NA	100 U	2,250	370	100 U	NA	NA	NA	110	50 U
Antimony	50 U	100 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	100 U	50 U	50 U	100 U	NA	NA	NA	50 U	50 U
Arsenic	2.8	8	2	4 J	1.4	5.2	1.6	1.5	0.8	1.6	4 J	1.2	3.2	1.9	3	3	3	5 J	1.4	4	0.8	1.7	1.4
Barium	12	49	13	18	NA	NA	NA	15	18	24	20	NA	NA	NA	14	26	15	14	NA	NA	NA	92	115
Beryllium	1 U	2 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	2 U	1 U	1 U	2 U	NA	NA	NA	1 U	1 U
Cadmium	2 U	4 U	2 U	2 U	NA	NA	NA	2 U	2 U	2 U	2 U	NA	NA	NA	4 U	2 U	2 U	4 U	NA	NA	NA	2 U	2 U
Chromium	5	10	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	10 U	5 U	5 U	10 U	NA	NA	NA	5 U	5 U
Copper	4	12	4	6	NA	NA	NA	2 U	4	3	4	NA	NA	NA	4 U	8	4	7	NA	NA	NA	3	2 U
Iron	3,490	7,580	1,020	2,440	NA	NA	NA	1,700	1,080	2,010	720	NA	NA	NA	490	4620	1370	500	NA	NA	NA	18,000	12,800
Lead	1	5 U	2 U	2 U	1 U	2	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	5 U	5 U	5 U	5 U	1 U	5 U	2 U	1	1 U
Manganese	125	382	176	107	NA	NA	NA	366	243	782	89	NA	NA	NA	90	239	300	38	NA	NA	NA	262	197
Mercury	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Molybdenum	8	40	6	5 U	NA	NA	NA	22	13	5 U	5	NA	NA	NA	40	20	8	10 U	NA	NA	NA	26	18
Nickel	6	17	5	7 J	NA	NA	NA	6.9	4.8	4.1	7 J	NA	NA	NA	8	11	6	10 J	NA	NA	NA	4.7	2
Selenium	50 U	100 U	50 U	50 U	NA	NA	NA	50 U	50 U	50 U	50 U	NA	NA	NA	100 U	50 U	50 U	100 U	NA	NA	NA	50 U	50 U
Silver	3 U	6 U	3 U	3 U	NA	NA	NA	3	3 U	3 U	3 U	NA	NA	NA	7	3 U	3 U	6 U	NA	NA	NA	3 U	3 U
Strontium	431	3,970	805	1,790	NA	NA	NA	1,400	738	606	2,320	NA	NA	NA	3,700	2,530	1,790	3,630	NA	NA	NA	299	347
Thallium	0.2 U	1 U	0.5 U	0.5 UJ	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1 UJ	0.2 U	0.2 U	0.2 U	1 U	1 U	1 U	1 UJ	0.2 U	1 U	0.5 U	0.2 U	0.2 U
Titanium	83	250	29	79	NA	NA	NA	6	21	12	14	NA	NA	NA	10 U	142	27	20	NA	NA	NA	11	5 U
Vanadium	7	9	5	7	NA	NA	NA	3 U	3 U	3 U	4	NA	NA	NA	6 U	7	6	6	NA	NA	NA	3 U	3 U
Zinc	20	20 U	10 U	10 U	NA	NA	NA	20	20	20	10 U	NA	NA	NA	20 U	10 U	10 U	20 U	NA	NA	NA	40	10 U
TPH (mg/L)																							
Gasoline Range Organics	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lube Oil	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SVOCs (µg/L)																							
1-Methylnaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2,2'-Oxybis(1-chloropropane)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2,4,5-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2,4,6-Trichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2,4-Dichlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2,4-Dimethylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	520 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2,4-Dinitrophenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U
2,4-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2,6-Dinitrotoluene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2-Chloronaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2-Chlorophenol	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2-Methylnaphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	37 J	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
2-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
3,3'-Dichlorobenzidine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SW-04							SW-05							SW-06							SW-07	
Sample Date	10/15/2008	12/18/2008	4/29/2009	7/24/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/6/2010	12/17/2008	4/28/2009
SVOCs (µg/L) (Continued)																							
3-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
4,6-Dinitro-2-methylphenol	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U	10 U	10 U	NA	NA	NA	10 U	10 U
4-Bromophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
4-Chloro-3-methylphenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
4-Chloroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
4-Chlorophenyl phenyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
4-Methylphenol	1 U	1 U	1 U	1 U	NA	NA	NA	55	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
4-Nitroaniline	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
4-Nitrophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
Acenaphthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Acenaphthylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Aniline	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzidine	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA	10 U	R	R	10 U	NA	NA	NA	R	R
Benzo(a)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzo(a)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzo(b)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzo(g,h,i)perylene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzo(k)fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzoic acid	10 U	R	10 U	10 U	NA	NA	NA	5500	R	10 U	10 U	NA	NA	NA	10 U	R	10 U	10 U	NA	NA	NA	R	10 U
Benzyl alcohol	5 U	5 U	5 U	5 U	NA	NA	NA	600	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
bis(2-Chloroethoxy)methane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
bis-(2-Chloroethyl)ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
bis(2-Ethylhexyl) phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1.7 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Butyl benzyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	23	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Carbaryl (Sevin)	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1.8	1.2
Carbazole	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Chrysene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Dibenz(a,h)anthracene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Dibenzofuran	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Diethyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1.9 J	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Dimethyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Di-n-butyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	2.8	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Di-n-octyl phthalate	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Fluoranthene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Fluorene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Hexachlorobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Hexachlorobutadiene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Hexachlorocyclopentadiene	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
Hexachloroethane	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Indeno(1,2,3-cd)pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Isophorone	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Naphthalene	1 U	1 U	1 U	1 U	NA	NA	NA	1.9 J	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Nitrobenzene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
N-Nitrosodimethylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
N-Nitroso-Di-N-Propylamine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
N-Nitrosodiphenylamine	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Pentachlorophenol	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
Phenanthrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Phenol	1 U	1 U	1 U	1 U	NA	NA	NA	50	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Pyrene	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Pyridine	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U	5 U	5 U	NA	NA	NA	5 U	5 U
PAHs (µg/L)																							
1-Methylnaphthalene	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	0.15 J	NA
2-Methylnaphthalene	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	0.061 J	NA
Acenaphthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.014	0.016 J	0.064	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01	0.01 U	NA	NA	NA	0.37 J	0.4
Acenaphthylene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Benzo(a)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Benzo(a)pyrene	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Benzo(b)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Benzo(g,h,i)perylene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Benzo(k)fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Chrysene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SW-04							SW-05							SW-06							SW-07	
Sample Date	10/15/2008	12/18/2008	4/29/2009	7/24/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/7/2010	10/15/2008	12/17/2008	4/29/2009	7/23/2009	4/13/2010	7/14/2010	10/6/2010	12/17/2008	4/28/2009
PAHs (µg/L) (Continued)																							
Dibenz(a,h)anthracene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Dibenzofuran	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	NA	0.01 UJ	NA	0.01 U	NA	NA	NA	0.065 J	NA
Fluoranthene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.015 J	0.018
Fluorene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.15 J	0.13
Indeno(1,2,3-cd)pyrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 UJ	0.01 U
Naphthalene	0.016 U	0.012 UJ	0.01 U	0.01 U	NA	NA	NA	0.022 U	0.014 UJ	0.019 U	0.01 U	NA	NA	NA	0.015 U	0.016 UJ	0.01 U	0.01 U	NA	NA	NA	0.097 J	0.11
Phenanthrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.059 J	0.062
Pyrene	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 U	0.01 UJ	0.01 U	0.01 U	NA	NA	NA	0.01 J	0.011
Total Benzofluoranthenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (µg/L)																							
1,1,1,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1,1-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1,2-Trichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,1-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,2,3-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
1,2,4-Trichlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
1,2,4-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2	0.8
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
1,2-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,2-Dichloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,2-Dichloropropane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,3,5-Trimethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2
1,3-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
1,4-Dichlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
2-Butanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U
2-Chloroethyl vinyl ether	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
2-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
2-Hexanone	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U
4-Chlorotoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
4-Isopropyltoluene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
4-Methyl-2-pentanone (MIBK)	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U	2.5 U	5 U	NA	NA	NA	2.5 U	2.5 U
Acetone	3 U	6.2 U	2.6 U	5 U	NA	NA	NA	3 U	5 U	4.8 U	5 U	NA	NA	NA	3 U	7.3 U	4.9 U	5 U	NA	NA	NA	7.3 U	6.5 U
Acrylonitrile	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U	1 U	1 U	NA	NA	NA	1 U	1 U
Benzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	2.2	3.6
Bromobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Bromodichloromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Bromoform	0.2 U	0.2 U	0.2 U	12	NA	NA	NA	0.2 U	0.2 U	0.2 U	15	NA	NA	NA	0.2 U	0.2 U	0.2 U	12	NA	NA	NA	0.2 U	0.2 U
Bromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
Carbon disulfide	0.2 U	0.2 U	0.2 U	0.2	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Carbon tetrachloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Chlorobenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Chloroethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Chloroform	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Chloromethane	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.5 U	NA	NA	NA	0.2 U	0.2 U
cis-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
cis-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Dibromochloromethane	0.2 U	0.2 U	0.2 U	0.3	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.3	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.3	NA	NA	NA	0.2 U	0.2 U
Dichlorodifluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Ethyl ether	1 U	NA	1 U	1 U	NA	NA	NA	1 U	NA	1 U	1 U	NA	NA	NA	1 U	NA	0.4 J	0.27 J	NA	NA	NA	NA	0.14 J
Ethylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Ethylene dibromide	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Hexachlorobutadiene	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
Isopropylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
m,p-Xylene	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA	NA	0.6	1.6
Methyl tert-butyl ether	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.2 U	0.5 U	0.5 U	NA	NA	NA	0.2 U	0.5 U
Methylene chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.6 U	0.5 U	0.5 U	0.5 U	NA	NA	NA	0.5 U	0.5 U
n-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
n-Propylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
o-Xylene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.9	2.2
sec-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Styrene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U

TABLE L-3

SUMMARY OF TEST RESULTS FOR MONITORING WELL, SEEP, AND SURFACE WATER SAMPLES
2008, 2009, 2010, AND 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Sample ID	SW-04							SW-05							SW-06							SW-07	
Sample Date	**10/15/2008**	**12/18/2008**	**4/29/2009**	**7/24/2009**	**4/13/2010**	**7/14/2010**	**10/7/2010**	**10/15/2008**	**12/17/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/14/2010**	**10/7/2010**	**10/15/2008**	**12/17/2008**	**4/29/2009**	**7/23/2009**	**4/13/2010**	**7/14/2010**	**10/6/2010**	**12/17/2008**	**4/28/2009**
VOCs (µg/L) (Continued)																							
tert-Butylbenzene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Tetrachloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Toluene	0.2 U	0.2 U	0.2	0.2 U	NA	NA	NA	0.2 U	0.2	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.8	1.4
trans-1,2-Dichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
trans-1,3-Dichloropropene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Trichloroethene	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Trichlorofluoromethane	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
Vinyl Chloride	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U
PCBs (µg/L)																							
Aroclor 1016	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.1 U
Aroclor 1221	0.01 U	0.03 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.025 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.01 UJ	0.062 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.1 U
Aroclor 1232	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.1 U
Aroclor 1242	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.1 U
Aroclor 1248	0.01 U	0.01 UJ	0.01 U	0.02 U	0.01 U	0.015 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.015 U	0.01 U	0.01 U	0.01 U	3 UJ	5 U
Aroclor 1254	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.75 U
Aroclor 1260	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.2 UJ	0.1 U
Total PCBs	0.01 U	0.03 UJ	0.01 U	0.02 U	0.01 U	0.015 U	0.01 U	0.025 U	0.025 UJ	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.025 U	0.01 UJ	0.062 U	0.015 U	0.01 U	0.01 U	0.01 U	3 UJ	5 U
Pesticides (µg/L)																							
4,4'-DDD	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	**0.0019 J**	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
4,4'-DDE	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.34 UJ	0.083 U
4,4'-DDT	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Aldrin	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.36 UJ	0.042 U
alpha-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0083 UJ	0.042 U
alpha-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.0044 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.0053 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0083 UJ	0.042 U
beta-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.0024 U	0.0008 U	0.0032 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.0018 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.0014 U	0.00083 U	0.055 UJ	0.042 U
cis-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA
delta-BHC	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 UJ	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 UJ	0.0017 U	0.002 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 UJ	0.0083 UJ	0.042 U
Dieldrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Endosulfan I	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.017 UJ	0.042 U
Endosulfan II	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Endosulfan sulfate	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Endrin	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Endrin aldehyde	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
Endrin ketone	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0033 U	0.0017 UJ	0.0017 U	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.017 UJ	0.083 U
gamma-Chlordane	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.0064 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	NA	NA	0.0083 UJ	0.042 U
gamma-BHC (Lindane)	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0026	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0083 UJ	0.042 U
Heptachlor	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0083 UJ	0.042 U
Heptachlor epoxide	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0017 U	0.00083 UJ	0.00083 U	0.00083 U	0.0008 U	0.00083 U	0.00083 U	0.0083 UJ	0.16 U
Methoxychlor	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U	0.017 U	0.0083 UJ	0.0083 U	0.0083 U	0.008 U	0.0083 U	0.0083 U	0.083 UJ	0.42 U
Toxaphene	0.17 U	0.083 UJ	0.083 U	0.083 U	0.08 U	0.083 U	0.083 U	0.17 U	0.083 UJ	0.083 U	0.083 U	0.08 U	0.083 U	0.083 U	0.17 U	0.083 UJ	0.083 U	0.083 U	0.08 U	0.083 U	0.083 U	0.83 UJ	4.2 U
trans-Chlordane	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA	NA	NA	NA	0.00083 U	0.00083 U	NA	NA

Notes

1. Data qualifers are as follows:

J = analyte was poistively identified; result is an estimated concentration.
J- = value is estimated with a possible low bias
R = analytical result is rejected based on quality control criteria.
U = analyte was not detected at reporting limit indicated.
UJ = analyte was not detected at the concentration indcated, which is the estimated reporting limit.

Abbreviations

NA = not analyzed
µg/L = micrograms per liter
mg/L = milligrams per liter
NE = not established
PAHs = polyaromatic hydrocarbons
PCBs = polychlorinated biphenyls
PSL = preliminary screening level
SVOCs = semivolatile organic compounds
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

TABLE L-4

SUMMARY OF GROUNDWATER SAMPLES
DIOXIN AND FURAN RESULTS
MARCH 2013[1]
March Point (Whitmarsh) Landfill
Skagit County, Washington

Location Sample Date	MW-8 3/26/2013	MW-9 3/26/2013	MW-9 3/26/2013 Field dup.
Dioxins/Furans (pg/L)			
1,2,3,4,6,7,8-HpCDD	2.06 U	1.1 U	3.04 U
1,2,3,4,6,7,8-HpCDF	0.32 U	0.42 U	0.52 U
1,2,3,4,7,8,9-HpCDF	0.54 U	0.66 U	0.88 U
1,2,3,4,7,8-HxCDD	0.58 U	0.54 U	0.52 U
1,2,3,4,7,8-HxCDF	0.4 U	0.4 U	0.38 U
1,2,3,6,7,8-HxCDD	0.58 U	0.58 U	0.54 U
1,2,3,6,7,8-HxCDF	0.38 U	0.38 U	0.34 U
1,2,3,7,8,9-HxCDD	0.6 U	0.6 U	0.56 U
1,2,3,7,8,9-HxCDF	0.58 U	0.56 U	0.54 U
1,2,3,7,8-PeCDD	0.42 U	0.54 U	0.52 U
1,2,3,7,8-PeCDF	0.48 U	0.56 U	0.52 U
2,3,4,6,7,8-HxCDF	0.42 U	0.44 U	0.4 U
2,3,4,7,8-PeCDF	0.52 U	0.6 U	0.6 U
2,3,7,8-TCDD	0.46 U	0.36 U	0.32 U
2,3,7,8-TCDF	0.44 U	0.3 U	0.3 U
OCDD	19.4 U	26.8 U	21.4 U
OCDF	1.66 U	1.6 U	1.24 U
Total TEQ	0	0	0
Homolog Group Concentrations			
Total HpCDD	6.32 EMPC	4.51 EMPC	6.01
Total HpCDF	0.54 U	0.424 EMPC	0.88 U
Total HxCDD	1.83 EMPC	0.802 EMPC	1.35 EMPC
Total HxCDF	0.288	0.56 U	0.54 U
Total PeCDD	1.4 EMPC	0.54 U	1.61 EMPC
Total PeCDF	1.54 EMPC	0.6 U	0.301 EMPC
Total TCDD	2.39 EMPC	0.36 U	1.31 EMPC
Total TCDF	11.7 EMPC	0.79	1.32 EMPC

Notes
1. Data qualifiers are as follows:
   U = Analyte not detected at the reporting limit shown.
   EMPC = Estimated Maximum Possible Concentration.

Abbreviations
pg/L = picograms per liter

Appendix C

Stormwater Letter

May 31, 2024

Project No. US-EI-PS21204410.01

Mr. David Horne
Site Manager and Bay-Wide Coordinator
Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, Washington 98504

Sent via e-mail: hoda461@ecy.wa.gov

Subject: Substantial Compliance with Stormwater Standards
Whitmarsh Landfill Cleanup Action Plan
Skagit County, Washington

Dear Mr. Horne:

The Whitmarsh Landfill, located on Padilla Bay in Anacortes, Washington is listed on the Washington State Department of Ecology (Ecology) Hazardous Sites List as Facility ID 2662, and is currently in the design phase. The project is exempt from local permitting, but it does require to have local jurisdiction to review and confirm the project is in substantial compliance with their standards.

In a recent conversation with the City of Anacortes (City), they have requested that a Stormwater Site Plan for the project be prepared in accordance with the 2019 Stormwater Management Manual for Western Washington (SWMMWW); a copy of the requirements and guidance is attached for your reference. WSP Earth and Environment, Inc. (WSP) has prepared this letter on behalf of Skagit County, to provide a summary of the project that we believe meets the intent of the request from the City even though the requirements set forth in the City's Stormwater Site Plan form and guidance do not directly relate for a landfill regrading and capping project. We request Ecology discuss the matter with the City to avoid further delay and allow application for a construction stormwater discharge permit to proceed.

COMPLIANCE WITH MINIMUM STANDARDS

The SWMMWW provides 9 minimum requirements for stormwater management for new developments. The Whitmarsh Landfill is classified as a new development project with respect to the SWMMWW as the site does not contain 35% or more of existing hard surface coverage. The project has land disturbing activities of 7,000 square feet or greater and converts greater than ¾ acres or more of vegetation to landscaped areas, triggering minimum requirements #1 through #9 for the project site. This document seeks to address the compliance of the Whitmarsh Landfill in accordance with the 9 minimum requirements presented in the SWMMWW.

MINIMUM REQUIREMENT NO. 1: PREPARATION OF STORMWATER SITE PLAN

This letter is intended to substantially fulfill Minimum Requirement 1: Preparation of Stormwater Site Plans and is prepared in accordance with Volume III of the 2019 SWMMWW.

MINIMUM REQUIREMENT NO. 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

A Construction Stormwater Pollution Prevention Plan (SWPPP) was prepared in accordance with Volume II of the 2019 SWMMWW for the Whitmarsh Landfill. The best management practices (BMPs) during construction are identified in the SWPPP. Primarily, the stormwater over the existing exposed landfill waste infiltrates. The

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earthwork along the shoreline is planned to be conducted in segments that can be covered in the same shift, thus minimizing exposure. The groundwater will be intercepted upgradient from trenches or pits, where the groundwater will be pumped to a central treatment system on site for processing and subsequent discharge into the local sanitary sewer system. Other steps such as sloping the work platform away from the shoreline, installing containment berms, or collecting any stormwater at the toe of the excavation, will be implemented to capture stormwater. The SWPPP has been updated and upon approval will be submitted to the City and Ecology's Water Quality Division.

MINIMUM REQUIREMENT NO. 3: SOURCE CONTROL OF POLLUTION

The intent of Source Control BMP's is to prevent stormwater from coming into contact with pollutants after project completion. The regraded waste will be covered with existing on-site sandy soil, then capped with geosynthetic low permeability layer and capped with three feet of imported earthen material. No pollution generating surfaces will be present after the final grading. The final surface will be vegetated on the slopes and grass or crushed rock surfacing. Source control BMP's that will be implemented for the construction phase of the project are described in the SWPPP. These BMP's will remain until all soils are stabilized.

MINIMUM REQUIREMENT NO. 4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

The existing site conditions contain two primary drainage conveyance systems in the form of swales bounding the northern and southern areas of the site. These existing swales discharge stormwater runoff directly to Padilla Bay and are tidally influenced with the high tide line (HTL) extending up to and beyond the downstream extents of either swale. These drainage systems will be maintained and widened on the north by over 20 feet and approximately two feet along the western portion of the southern swale to ensure the preservation of pre-existing drainage systems. The modifications of the northern drainage swale will result in the swale being tidally influenced throughout its extents. Modifications to the southern drainage swale are minor and include regrading and stabilizing the bank abutting the landfill with drain rock and crushed surfacing top course (see Detail 2 on sheet C-14 of the Remedial Action plan set).

MINIMUM REQUIREMENT NO. 5: ONSITE STORMWATER MANAGEMENT

Projects qualifying as flow control exempt shall either use Low Impact Development (LID) BMPs from SWMMWW List #3 for all surfaces or use the Flow Control BMPs desired to achieve LID Performance Standard and apply BMP T5.13: Post Construction Soil Quality and Depth. Since the project is flow control exempt (see Minimum Requirement No. 7) and employs guidance from BMP T5.13, the objective of on-site stormwater management is achieved.

Establishing soil quality and depth regains greater stormwater functions in the post development landscape, provides increased treatment of pollutants and sediments that result from development and habitation, and minimizes the need for some landscaping chemicals, thus reducing pollution from prevention. BMP T5.13 requires a minimum 8-inch topsoil layer with a minimum organic matter content of 10% dry weight in planting beds.

The project proposes to place four layers of imported earthen material totaling 3 feet thick above the geosynthetic cap. The top 6 inches will be select topsoil from a virgin source and characterized; it's use will be subject to approval by Ecology. Below the topsoil will be three additional layers of material. Directly beneath the topsoil is 12-inch-thick layer of common earth/borrow which will be track-compacted. Then below that will be a 12-inch layer of select borrow over a 6-inch layer of sand. The slopes along the north, east, and southeast of the final grade will be landscaped with select plants; see sheets R-1 through R-8 for the final planting and restorations. At the plant locations the completed backfill will be hand-excavated to the depth of 12 inches and backfilled with soil and compost along with the plants. Topsoil will be stabilized through seeding and riparian planting, distinguished by area type (i.e. Upper Cap & Roadside Seed Mix, Lower Slope Shoreline Seed Mix, and Riparian Shrub Areas), further increasing the organic content in the topsoil layer. The proposed engineered low permeability cap substantially meets the intent set forth from BMP T5.13.

MINIMUM REQUIREMENT NO. 6: RUNOFF TREATMENT

For the proposed final grading plan, no pollution-generating hard surfaces (PGHS) will be constructed. The proposed one-way access road surrounding the site vicinity is considered a hard surface in accordance with the SWMMWW. However, the access road falls under the category of an infrequently used maintenance access road

and is not considered to have "vehicular use" by the definition in the SWMMWW and therefore not PGHS. The completed site will be enclosed with coated chain link fence allowing site access solely to authorized personnel for long term maintenance and monitoring. There will be no PGHS on the developed site triggering Minimum Requirement No. 6.

No pollution-generating pervious surfaces (PGPS) are proposed in the final site plan. The upper cap will be planted with seed mix, the lower sloped shoreline will include both riparian shrubs and seed mix, and below the high tide line (HTL) will be bare sand. The site planting plan incorporates the use of organic, phosphate free fertilizer for initial planting. During the 5-year monitoring period, herbicides will be allowed as a last measure after first removing of invasives species. However, fertilizers and herbicides are not planned for long-term maintenance of the site. Therefore, the pervious surfaces are not considered pollution generating.

MINIMUM REQUIREMENT NO. 7: FLOW CONTROL

Flow control is not required for threshold discharge areas (TDAs) that discharge directly or indirectly through manmade conveyance elements that have sufficient capacity and adequately stabilized to prevent erosion to exempt receiving waters. Table I-A.1 in Appendix A of the SWMMWW lists Flow Control Exempt Receiving Waters. All salt waterbodies are classified as flow control exempt receiving waters.

The site is considered to be a single TDA because the entire site drains to a single natural discharge location (tidally exempt waters of Padilla Bay) that combines (via the two drainage swales) within one-quarter mile downstream of the site. The modifications of the northern drainage swale will result in the swale being tidally influenced throughout its extent. Runoff from the site draining north, even though it drains into the northern drainage swale, will drain directly into the exempt water body. The southern swale is mapped as a Category II wetland (described below in Minimum Requirement No. 8), however, modifications to the southern drainage swale include regrading and stabilizing the bank abutting the landfill with drain rock and crushed rock. These modifications will maintain sufficient capacity and stabilization through the swale to the tidal waters of Padilla Bay. The stormwater runoff from the site will be conveyed to the high tide line (HTL) of Padilla Bay, an exempt receiving water body, exempting the Whitmarsh Landfill to employ flow control BMPs.

MINIMUM REQUIREMENT NO. 8: WETLANDS PROTECTION

To protect the hydroperiods of wetlands that will receive stormwater flows post-construction of the site, certain criteria need to be met depending on the wetland category and hydrogeomorphic class as defined in Ecology's Wetland Rating System for Western Washington (Hruby and Yahnke 2023) and whether the applicant owns or has legal access to the site. Hamer LLC conducted a delineation of the site and their findings resulted in the delineation of two wetlands, a Category I saltwater marsh and a Category II palustrine marsh. Information contained within the rating forms concluded that the Category II palustrine marsh is an impounding depressional wetland.

The trigger for the need to review the hydroperiod protection measures is whether the project will trigger Minimum Requirement No. 7 (Flow Control). As stated above, the project will be exempt from flow control requirements as all saltwater bodies are on the list of exempt receiving waters. However, all flows that discharge to the southern swale pass along the Category II palustrine marsh prior to entering the exempt water body. This discharge from the site could be considered subject to the hydroperiod protection measures. As a Category II impounding depressional wetland to which the applicant has legal access to, Method I monitoring criteria is typically considered.

Method I monitoring involves installing monitoring wells and monitoring the water holding capacity of the wetland for one water year of field monitoring. However, due to the wetland being controlled mainly by the diurnal tides that create backwater into this wetland, it is not anticipated that the proposed stormwater will result in a discernable change to the wetlands hydroperiod and water holding capacity. Essentially, any monitoring efforts following Method I will result in a water surface elevation that correlates to the tidal cycle rather than a "natural" surface elevation in a non-tidally controlled impounding depressional wetland. Areas, that pond water will maintain their existing heights and during low tides the water level is anticipated to be equal to the existing conditions. Due to this tidal control on the wetland ponding depths, it is reasonable to conclude that Method I monitoring of this wetland will not be required and no further action is necessary to meet Minimum Requirement No. 8.

MINIMUM REQUIREMENT NO. 9: OPERATION AND MAINTENANCE

The objective of this minimum requirement is to ensure that Stormwater Management BMPs are properly maintained and operated. All temporary and permanent erosion and sediment control BMP's will be maintained and repaired as needed to ensure continued performance of their intended function. The maintenance plan and inspection forms can be reviewed in the SWPPP (WSP, 2024). A long-term maintenance plan is described in the Final Wetland Buffer Mitigation Plan (WSP, 2024) which describes maintenance requirements, monitoring methods, the frequency of inspections and success criteria.

Please call me if you have questions about this letter.

Sincerely,
WSP USA Environment & Infrastructure Inc.

Chester Croson, EIT
Associate Consultant, Water Resources Engineering

Scott Stoneman
Vice President, Civil Engineering

Attachments: City of Anacortes Stormwater Site Plan Guidance
90% Design Drawings

c: Susannah Edwards, Ecology
Amy Hargrove, Ecology
Margo Gillaspy, Skagit County
Koorus Tahghighi, WSP
Project File

ATTACHMENT

CITY OF ANACORTES STORMWATER SITE PLAN GUIDANCE

ATTACHMENT

90% DESIGN DRAWINGS

Appendix D

Best Management Practices

Construction Stormwater Best Management Practices (BMPs) To Be Implemented

BMP C101: Preserving Natural Vegetation

Purpose

The purpose of preserving natural vegetation is to reduce erosion wherever practicable. Limiting site disturbance is the single most effective method for reducing erosion. For example, conifers can hold up to about 50 percent of all rain that falls during a storm. Up to 20-30 percent of this rain may never reach the ground but is taken up by the tree or evaporates. Another benefit is that the rain held in the tree can be released slowly to the ground after the storm.

Conditions of Use

Natural vegetation should be preserved on steep slopes, near perennial and intermittent water-courses or swales, and on building sites in wooded areas.

- As required by local governments.
- Phase construction to preserve natural vegetation on the project site for as long as possible during the construction period.

Design and Installation Specifications

Natural vegetation can be preserved in natural clumps or as individual trees, shrubs and vines.

The preservation of individual plants is more difficult because heavy equipment is generally used to remove unwanted vegetation. The points to remember when attempting to save individual plants are:

- Is the plant worth saving? Consider the location, species, size, age, vigor, and the work involved. Local governments may also have ordinances to save natural vegetation and trees.
- Fence or clearly mark areas around trees that are to be saved. It is preferable to keep ground disturbance away from the trees at least as far out as the dripline.

Plants need protection from three kinds of injuries:

- *Construction Equipment* - This injury can be above or below the ground level. Damage results from scarring, cutting of roots, and compaction of the soil. Placing a fenced buffer zone around plants to be saved prior to construction can prevent construction equipment injuries.

- *Grade Changes* - Changing the natural ground level will alter grades, which affects the plant's ability to obtain the necessary air, water, and minerals. Minor fills usually do not cause problems although sensitivity between species does vary and should be checked. Trees can typically tolerate fill of 6 inches or less. For shrubs and other plants, the fill should be less.

  When there are major changes in grade, it may become necessary to supply air to the roots of plants. This can be done by placing a layer of gravel and a tile system over the roots before the fill is made. The tile system should be laid out on the original grade leading from a dry well around the tree trunk. The system should then be covered with small stones to allow air to circulate over the root area.

Lowering the natural ground level can seriously damage trees and shrubs. The highest percentage of the plant roots are in the upper 12 inches of the soil and cuts of only 2-3 inches can cause serious injury. To protect the roots it may be necessary to terrace the immediate area around the plants to be saved. If roots are exposed, construction of retaining walls may be needed to keep the soil in place. Plants can also be preserved by leaving them on an undisturbed, gently sloping mound. To increase the chances for survival, it is best to limit grade changes and other soil disturbances to areas outside the dripline of the plant.

- *Excavations* - Protect trees and other plants when excavating for drainfields, power, water, and sewer lines. Where possible, the trenches should be routed around trees and large shrubs. When this is not possible, it is best to tunnel under them. This can be done with hand tools or with power augers. If it is not possible to route the trench around plants to be saved, then the following should be observed:
    - Cut as few roots as possible. When you have to cut, cut clean. Paint cut root ends with a wood dressing like asphalt base paint if roots will be exposed for more than 24-hours.
    - Backfill the trench as soon as possible.
    - Tunnel beneath root systems as close to the center of the main trunk to preserve most of the important feeder roots.

Some problems that can be encountered with a few specific trees are:

- Maple, Dogwood, Red alder, Western hemlock, Western red cedar, and Douglas fir do not readily adjust to changes in environment and special care should be taken to protect these trees.
- The windthrow hazard of Pacific silver fir and madrona is high, while that of Western hemlock is moderate. The danger of windthrow increases where dense stands have been thinned. Other species (unless they are on shallow, wet soils less than 20 inches deep) have a low windthrow hazard.
- Cottonwoods, maples, and willows have water-seeking roots. These can cause trouble in sewer lines and infiltration fields. On the other hand, they thrive in high moisture conditions that other trees would not.
- Thinning operations in pure or mixed stands of Grand fir, Pacific silver fir, Noble fir, Sitka spruce, Western red cedar, Western hemlock, Pacific dogwood, and Red alder can cause serious disease problems. Disease can become established through damaged limbs, trunks, roots, and freshly cut stumps. Diseased and weakened trees are also susceptible to insect attack.

Maintenance Standards

Inspect flagged and/or fenced areas regularly to make sure flagging or fencing has not been removed or damaged. If the flagging or fencing has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored. If tree roots have been exposed or injured, “prune” cleanly with an appropriate pruning saw or lop- pers directly above the damaged roots and recover with native soils. Treatment of sap flowing trees (fir, hemlock, pine, soft maples) is not advised as sap forms a natural healing barrier.

BMP C105: Stabilized Construction Access

Purpose

Stabilized construction accesses are established to reduce the amount of sediment transported onto paved roads outside the project site by vehicles or equipment. This is done by constructing a stabilized pad of quarry spalls at entrances and exits for project sites.

Conditions of Use

Construction accesses shall be stabilized wherever traffic will be entering or leaving a construction site if paved roads or other paved areas are within 1,000 feet of the site.

For residential subdivision construction sites, provide a stabilized construction access for each residence, rather than only at the main subdivision entrance. Stabilized surfaces shall be of sufficient length/width to provide vehicle access/parking, based on lot size and configuration.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized accesses not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

See Figure II-3.1: Stabilized Construction Access for details. Note: the 100' minimum length of the access shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').

Construct stabilized construction accesses with a 12-inch thick pad of 4-inch to 8-inch quarry spalls, a 4-inch course of asphalt treated base (ATB), or use existing pavement. Do not use crushed concrete, cement, or calcium chloride for construction access stabilization because these products raise pH levels in stormwater and concrete discharge to waters of the State is prohibited.

A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the standards listed in Table II-3.2: Stabilized Construction Access Geotextile Standards.

Table II-3.2: Stabilized Construction Access Geotextile Standards

Geotextile Property	Required Value
Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will be paved; this can be used as a stabilized access. Also consider the installation of excess concrete as a stabilized access. During large concrete pours, excess concrete is often available for this purpose.
- Fencing (see BMP C103: High-Visibility Fence) shall be installed as necessary to restrict traffic to the construction access.

- Whenever possible, the access shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.
- Construction accesses should avoid crossing existing sidewalks and back of walk drains if at all possible. If a construction access must cross a sidewalk or back of walk drain, the full length of the sidewalk and back of walk drain must be covered and protected from sediment leaving the site.

Alternative Material Specification

WSDOT has raised safety concerns about the Quarry Spall rock specified above. WSDOT observes that the 4-inch to 8-inch rock sizes can become trapped between Dually truck tires, and then released off-site at highway speeds. WSDOT has chosen to use a modified specification for the rock while continuously verifying that the Stabilized Construction Access remains effective. To remain effective, the BMP must prevent sediment from migrating off site. To date, there has been no performance testing to verify operation of this new specification. Jurisdictions may use the alternative specification, but must perform increased off-site inspection if they use, or allow others to use, it.

Stabilized Construction Accesses may use material that meets the requirements of WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction* Section 9-03.9(1) (WSDOT, 2016) for ballast except for the following special requirements.

The grading and quality requirements are listed in Table II-3.3: Stabilized Construction Access Alternative Material Requirements.

Table II-3.3: Stabilized Construction Access Alternative Material Requirements

Sieve Size	Percent Passing
2½″	99-100
2″	65-100
¾″	40-80
No. 4	5 max.
No. 100	0-2
% Fracture	75 min.

- All percentages are by weight.
- The sand equivalent value and dust ratio requirements do not apply.
- The fracture requirement shall be at least one fractured face and will apply the combined aggregate retained on the No. 4 sieve in accordance with FOP for AASHTO T 335.

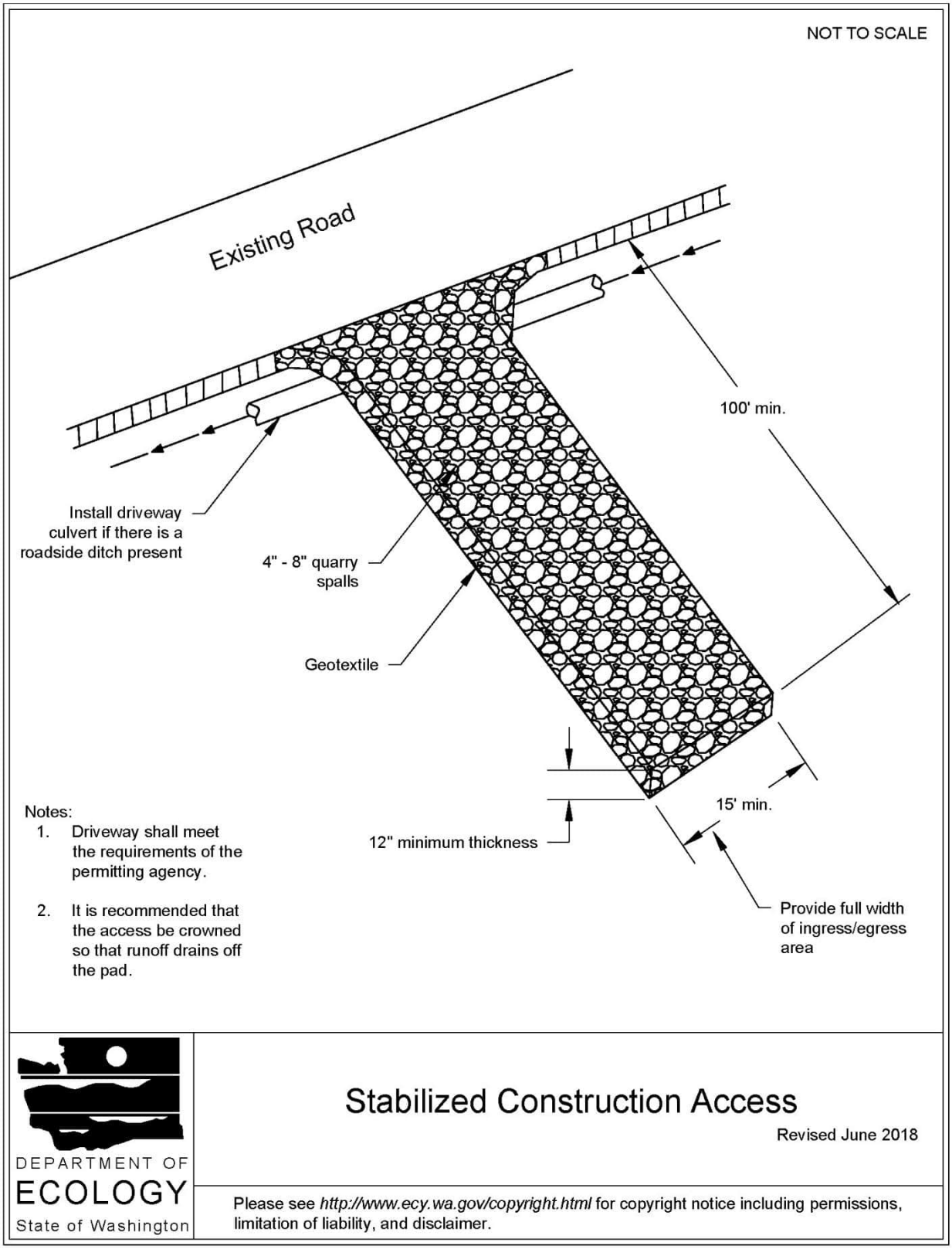
Maintenance Standards

Quarry spalls shall be added if the pad is no longer in accordance with the specifications.

- If the access is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include replacement/cleaning of the existing quarry spalls, street sweeping, an increase in the dimensions of the access, or the installation of BMP C106: Wheel Wash.

- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when high efficiency sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump to contain the wash water shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Perform street sweeping by hand or with a high efficiency sweeper. Do not use a non-high efficiency mechanical sweeper because this creates dust and throws soils into storm systems or conveyance ditches.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction access(es), BMP C103: High-Visibility Fence shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

Figure II-3.1: Stabilized Construction Access



Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C120: Temporary and Permanent Seeding

Purpose

Seeding reduces erosion by stabilizing exposed soils. A well-established vegetative cover is one of the most effective methods of reducing erosion.

Conditions of Use

Use seeding throughout the project on disturbed areas that have reached final grade or that will remain unworked for more than 30 days.

The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1.

Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established.

Between October 1 and March 30 seeding requires a cover of mulch or an erosion control blanket until 75 percent grass cover is established.

Review all disturbed areas in late August to early September and complete all seeding by the end of September. Otherwise, vegetation will not establish itself enough to provide more than average protection.

Mulch is required at all times for seeding because it protects seeds from heat, moisture loss, and transport due to runoff. Mulch can be applied on top of the seed or simultaneously by hydroseeding. See BMP C121: Mulching for specifications.

Seed and mulch all disturbed areas not otherwise vegetated at final site stabilization. Final stabilization means the completion of all soil disturbing activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion. See BMP T5.13: Post-Construction Soil Quality and Depth.

Design and Installation Specifications

General

- Install channels intended for vegetation before starting major earthwork and hydroseed with a Bonded Fiber Matrix. For vegetated channels that will have high flows, install erosion control blankets over the top of hydroseed. Before allowing water to flow in vegetated channels, establish 75 percent vegetation cover. If vegetated channels cannot be established by seed

before water flow; install sod in the channel bottom — over top of hydromulch and erosion control blankets.

- Confirm the installation of all required surface water control measures to prevent seed from washing away.
- Hydroseed applications shall include a minimum of 1,500 pounds per acre of mulch with 3 per- cent tackifier. See BMP C121: Mulching for specifications.
- Areas that will have seeding only and not landscaping may need compost or meal-based mulch included in the hydroseed in order to establish vegetation. Re-install native topsoil on the disturbed soil surface before application. See BMP T5.13: Post-Construction Soil Quality and Depth.
- When installing seed via hydroseeding operations, only about 1/3 of the seed actually ends up in contact with the soil surface. This reduces the ability to establish a good stand of grass quickly. To overcome this, consider increasing seed quantities by up to 50 percent.
- Enhance vegetation establishment by dividing the hydromulch operation into two phases:
    - Phase 1- Install all seed and fertilizer with 25-30 percent mulch and tackifier onto soil in the first lift.
    - Phase 2- Install the rest of the mulch and tackifier over the first lift.

  Or, enhance vegetation by:

    - Installing the mulch, seed, fertilizer, and tackifier in one lift.
    - Spread or blow straw over the top of the hydromulch at a rate of 800-1000 pounds per acre.
    - Hold straw in place with a standard tackifier.

  Both of these approaches will increase cost moderately but will greatly improve and enhance vegetative establishment. The increased cost may be offset by the reduced need for:

    - Irrigation.
    - Reapplication of mulch.
    - Repair of failed slope surfaces.

  This technique works with standard hydromulch (1,500 pounds per acre minimum) and Bonded Fiber Matrix/ Mechanically Bonded Fiber Matrix (BFM/MBFMs) (3,000 pounds per acre minimum).

- Seed may be installed by hand if:
    - Temporary and covered by straw, mulch, or topsoil.
    - Permanent in small areas (usually less than 1 acre) and covered with mulch, topsoil, or erosion blankets.

- The seed mixes listed in Table II-3.4: Temporary and Permanent Seed Mixes include recommended mixes for both temporary and permanent seeding.
- Apply these mixes, with the exception of the wet area seed mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Apply the wet area seed mix at a rate of 60 pounds per acre.
- Consult the local suppliers or the local conservation district for their recommendations. The appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used, depending on the soil type and hydrology of the area.

Table II-3.4: Temporary and Permanent Seed Mixes

Common Name	Latin Name	% Weight	% Purity	% Germination
Temporary Erosion Control Seed Mix A standard mix for areas requiring a temporary vegetative cover.				
Chewings or annual blue grass	*Festuca rubra var. commutata* or *Poa anna*	40	98	90
Perennial rye	*Lolium perenne*	50	98	90
Redtop or colonial bentgrass	*Agrostis alba* or *Agrostis tenuis*	5	92	85
White dutch clover	*Trifolium repens*	5	98	90
Landscaping Seed Mix A recommended mix for landscaping seed.				
Perennial rye blend	*Lolium perenne*	70	98	90
Chewings and red fescue blend	*Festuca rubra var. commutata* or *Festuca rubra*	30	98	90
Low-Growing Turf Seed Mix A turf seed mix for dry situations where there is no need for watering. This mix requires very little maintenance.				
Dwarf tall fescue (several varieties)	*Festuca arundinacea var.*	45	98	90
Dwarf perennial rye (Barclay)	*Lolium perenne var. barclay*	30	98	90
Red fescue	*Festuca rubra*	20	98	90
Colonial bentgrass	*Agrostis tenuis*	5	98	90
Bioswale Seed Mix A seed mix for bioswales and other intermittently wet areas.				
Tall or meadow fescue	*Festuca arundinacea* or *Festuca elatior*	75-80	98	90
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	92	85
Redtop bentgrass	*Agrostis alba* or *Agrostis gigantea*	5-10	90	80

Table II-3.4: Temporary and Permanent Seed Mixes (continued)

Common Name	Latin Name	% Weight	% Purity	% Germination
Wet Area Seed Mix A low-growing, relatively non-invasive seed mix appropriate for very wet areas that are not regulated wetlands. Consult Hydraulic Permit Authority (HPA) for seed mixes if applicable.				
Tall or meadow fescue	*Festuca arundinacea* or *Festuca elatior*	60-70	98	90
Seaside/Creeping bentgrass	*Agrostis palustris*	10-15	98	85
Meadow foxtail	*Alepocurus pratensis*	10-15	90	80
Alsike clover	*Trifolium hybridum*	1-6	98	90
Redtop bentgrass	*Agrostis alba*	1-6	92	85
Meadow Seed Mix A recommended meadow seed mix for infrequently maintained areas or non-maintained areas where colonization by native plants is desirable. Likely applications include rural road and utility right-of-way. Seed- ing should take place in September or very early October in order to obtain adequate establishment prior to the winter months. Consider the appropriateness of clover, a fairly invasive species, in the mix. Amending the soil can reduce the need for clover.				
Redtop or Oregon bentgrass	*Agrostis alba* or *Agrostis oregonensis*	20	92	85
Red fescue	*Festuca rubra*	70	98	90
White dutch clover	*Trifolium repens*	10	98	90

Roughening and Rototilling

- The seedbed should be firm and rough. Roughen all soil no matter what the slope. Track walk slopes before seeding if engineering purposes require compaction. Backblading or smoothing of slopes greater than 4H:1V is not allowed if they are to be seeded.
- Restoration-based landscape practices require deeper incorporation than that provided by a simple single-pass rototilling treatment. Wherever practical, initially rip the subgrade to improve long-term permeability, infiltration, and water inflow qualities. At a minimum, permanent areas shall use soil amendments to achieve organic matter and permeability performance defined in engineered soil/landscape systems. For systems that are deeper than 8 inches complete the rototilling process in multiple lifts, or prepare the engineered soil system per specifications and place to achieve the specified depth.

Fertilizers

- Conducting soil tests to determine the exact type and quantity of fertilizer is recommended. This will prevent the over-application of fertilizer.

- Organic matter is the most appropriate form of fertilizer because it provides nutrients (including nitrogen, phosphorus, and potassium) in the least water-soluble form.
- In general, use 10-4-6 N-P-K (nitrogen-phosphorus-potassium) fertilizer at a rate of 90 pounds per acre. Always use slow-release fertilizers because they are more efficient and have fewer environmental impacts. Do not add fertilizer to the hydromulch machine, or agitate, more than 20 minutes before use. Too much agitation destroys the slow-release coating.
- There are numerous products available that take the place of chemical fertilizers. These include several with seaweed extracts that are beneficial to soil microbes and organisms. If 100 percent cottonseed meal is used as the mulch in hydroseed, chemical fertilizer may not be necessary. Cottonseed meal provides a good source of long-term, slow-release, available nitrogen.

Bonded Fiber Matrix and Mechanically Bonded Fiber Matrix

- On steep slopes use Bonded Fiber Matrix (BFM) or Mechanically Bonded Fiber Matrix (MBFM) products. Apply BFM/MBFM products at a minimum rate of 3,000 pounds per acre with approximately 10 percent tackifier. Achieve a minimum of 95 percent soil coverage during application. Numerous products are available commercially. Most products require 24-36 hours to cure before rainfall and cannot be installed on wet or saturated soils. Generally, products come in 40-50 pound bags and include all necessary ingredients except for seed and fertilizer.
- Install products per manufacturer's instructions.
- BFMs and MBFMs provide good alternatives to blankets in most areas requiring vegetation establishment. Advantages over blankets include:
    - BFM and MBFMs do not require surface preparation.
    - Helicopters can assist in installing BFM and MBFMs in remote areas.
    - On slopes steeper than 2.5H:1V, blanket installers may require ropes and harnesses for safety.
    - Installing BFM and MBFMs can save at least $1,000 per acre compared to blankets.

Maintenance Standards

Reseed any seeded areas that fail to establish at least 75 percent cover (100 percent cover for areas that receive sheet or concentrated flows). If reseeding is ineffective, use an alternate method such as sodding, mulching, nets, or blankets.

- Reseed and protect by mulch any areas that experience erosion after achieving adequate cover. Reseed and protect by mulch any eroded area.
- Supply seeded areas with adequate moisture, but do not water to the extent that it causes run- off.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C121: Mulching

Purpose

Mulching soils provides immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There are a variety of mulches that can be used. This section discusses only the most common types of mulch.

Conditions of Use

As a temporary cover measure, mulch should be used:

- For less than 30 days on disturbed areas that require cover.
- At all times for seeded areas, especially during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief. Mulch may be applied at any time of the year and must be refreshed periodically.

For seeded areas, mulch may be made up of 100 percent:

- cottonseed meal;
- fibers made of wood, recycled cellulose, hemp, or kenaf;
- compost;
- or blends of these.

Tackifier shall be plant-based, such as guar or alpha plantago, or chemical-based such as poly-acrylamide or polymers.

Generally, mulches come in 40-50 pound bags. Seed and fertilizer are added at time of application.

Recycled cellulose may contain polychlorinated biphenyl (PCBs). Ecology recommends that products should be evaluated for PCBs prior to use.

Refer to BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body.

Any mulch or tackifier product used shall be installed per the manufacturer's instructions.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table II-3.6: Mulch Standards and Guidelines. Consult with the local supplier or the local conservation district for their recommendations. Increase the application rate until the ground is 95% covered (i.e. not visible under the mulch layer). Note: Thickness may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Where the option of "Compost" is selected, it should be a coarse compost that meets the size gradations listed in Table II-3.5: Size Gradations of Compost as Mulch Material when tested in accordance with Test Method 02.02-B found in *Test Methods for the Examination of Composting and Compost* (Thompson, 2001).

Table II-3.5: Size Gradations of Compost as Mulch Material

Sieve Size	Percent Passing
3"	100%
1"	90% - 100%
3/4"	70% - 100%
1/4"	40% - 100%

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material. Consult the Hydraulic Permit Authority (HPA) for mulch mixes if applicable.

Maintenance Standards

The thickness of the mulch cover must be maintained.

Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table II-3.6: Mulch Standards and Guidelines

Mulch Material	Guideline	Description
Straw	**Quality Standards**	Air-dried; free from undesirable seed and coarse material.
	Application Rates	2"-3" thick; 5 bales per 1,000 sf or 2-3 tons per acre
	Remarks	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
	Quality Standards	No growth inhibiting factors.
	Application Rates	Approx. 35-45 lbs per 1,000 sf or 1,500 - 2,000 lbs per acre

Hydromulch	**Remarks**	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about 3/4 - 1 inch clog hydromulch equipment. Fibers should be kept to less than 3/4 inch.
Compost	**Quality Standards**	No visible water or dust during handling. Must be produced per WAC 173-350, Solid Waste Handling Standards, but may have up to 35% biosolids.
	Application Rates	2" thick min.; approx. 100 tons per acre (approx. 750 lbs per cubic yard)
	Remarks	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Compost used for mulch has a coarser size gradation than compost used for BMP C125: Topsoiling / Composting or BMP T5.13: Post-Construction Soil Quality and Depth. It is more stable and practical to use in wet areas and during rainy weather conditions. Do not use near wetlands or near phosphorous impaired water
Chipped Site Vegetation	**Quality Standards**	Gradations from fines to 6 inches in length for texture, variation, and inter-locking properties. Include a mix of various sizes so that the average size is between 2- and 4- inches.
	Application Rates	2" thick min.;
	Remarks	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of sur- face waters. If permanent seeding or planting is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment. Note: thick application of this material over existing grass, herbaceous species, and some groundcovers could smother and kill vegetation.
Wood- Based Mulch	**Quality Standards**	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.
	Application Rates	2" thick min.; approx. 100 tons per acre (approx. 750 lbs. per cubic yard)
	Remarks	This material is often called "wood straw" or "hog fuel". The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).
	Quality Standards	A blend of loose, long, thin wood pieces derived from native conifer or deciduous trees with high length-to-width ratio.
	Application Rates	2" thick min.

Wood Strand Mulch	**Remarks**	Cost-effective protection when applied with adequate thickness. A minimum of 95-percent of the wood strand shall have lengths between 2 and 10-inches, with a width and thickness between 1/16 and 1/2-inches. The mulch shall not contain resin, tannin, or other compounds in quantities that would be detrimental to plant life. Sawdust or wood shavings shall not be used as mulch. [Specification 9-14.4(4) from the *Standard Specifications for Road, Bridge, and Municipal Construction* (WSDOT, 2016)

BMP C122: Nets and Blankets

Purpose

Erosion control nets and blankets are intended to prevent erosion and hold seed and mulch in place on steep slopes and in channels so that vegetation can become well established. In addition, some nets and blankets can be used to permanently reinforce turf to protect drainage ways during high flows.

Nets (commonly called matting) are strands of material woven into an open, but high-tensile strength net (for example, coconut fiber matting). Blankets are strands of material that are not tightly woven, but instead form a layer of interlocking fibers, typically held together by a biodegradable or photodegradable netting (for example, excelsior or straw blankets). They generally have lower tensile strength than nets, but cover the ground more completely. Coir (coconut fiber) fabric comes as both nets and blankets.

Conditions of Use

Erosion control netting and blankets shall be made of natural plant fibers unaltered by synthetic materials.

Erosion control nets and blankets should be used:

- To aid permanent vegetated stabilization of slopes 2H:1V or greater and with more than 10 feet of vertical relief.
- For drainage ditches and swales (highly recommended). The application of appropriate net-ting or blanket to drainage ditches and swales can protect bare soil from channelized runoff while vegetation is established. Nets and blankets also can capture a great deal of sediment due to their open, porous structure. Nets and blankets can be used to permanently stabilize channels and may provide a cost-effective, environmentally preferable alternative to riprap.

Disadvantages of nets and blankets include:

- Surface preparation is required.
- On slopes steeper than 2.5H:1V, net and blanket installers may need to be roped and harnessed for safety.
- They cost at least $4,000-6,000 per acre installed. Advantages of nets and blankets include:
- Installation without mobilizing special equipment.
- Installation by anyone with minimal training
- Installation in stages or phases as the project progresses.
- Installers can hand place seed and fertilizer as they progress down the slope.
- Installation in any weather.
- There are numerous types of nets and blankets that can be designed with various parameters in mind. Those parameters include: fiber blend, mesh strength, longevity, biodegradability, cost, and availability.

An alternative to nets and blankets in some limited conditions is BMP C202: Riprap Channel Lining. Ensure that BMP C202: Riprap Channel Lining is appropriate before using it as a substitute for nets and blankets.

Design and Installation Specifications

- See Figure II-3.3: Channel Installation (Clackamas County et al., 2008) and Figure II-3.4: Slope Installation for typical orientation and installation of nets and blankets used in channels and as slope protection. Note: these are typical only; all nets and blankets must be installed per manufacturer's installation instructions.
- Installation is critical to the effectiveness of these products. If good ground contact is not achieved, runoff can concentrate under the product, resulting in significant erosion.
- Installation of nets and blankets on slopes.

    1. Complete final grade and track walk up and down the slope.
    2. Install hydromulch with seed and fertilizer.
    3. Dig a small trench, approximately 12 inches wide by 6 inches deep along the top of the slope.
    4. Install the leading edge of the net/blanket into the small trench and staple approximately every 18 inches. NOTE: Staples are metal, "U"-shaped, and a minimum of 6 inches long. Longer staples are used in sandy soils. Biodegradable stakes are also available.
    5. Roll the net/blanket slowly down the slope as the installer walks backward. NOTE: The net/blanket rests against the installer's legs. Staples are installed as the net/blanket is unrolled. It is critical that the proper staple pattern is used for the net/blanket being installed. The net/blanket is not to be allowed to roll down the slope on its own as this stretches the net/blanket, making it impossible to maintain soil contact. In addition, no one is allowed to walk on the net/blanket after it is in place.
    6. If the net/blanket is not long enough to cover the entire slope length, the trailing edge of the upper net/blanket should overlap the leading edge of the lower net/blanket and be stapled. On steeper slopes, this overlap should be installed in a small trench, stapled, and covered with soil.

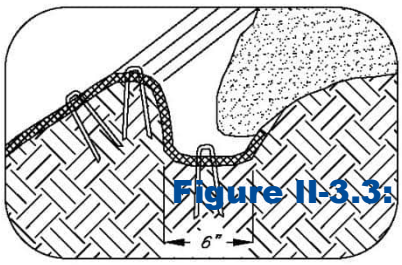
- With the variety of products available, it is impossible to cover all the details of appropriate use and installation. Therefore, it is critical that the designer consult the manufacturer's information and that a site visit takes place in order to ensure that the product specified is appropriate. Information is also available in WSDOT's *Standard Specifications for Road, Bridge, and Municipal Construction* Division 8-01 and Division 9-14 (WSDOT, 2016).
- Use jute matting in conjunction with mulch (BMP C121: Mulching). Excelsior, woven straw blankets and coir (coconut fiber) blankets may be installed without mulch. There are many other types of erosion control nets and blankets on the market that may be appropriate in certain circumstances.
- In general, most nets (e.g., jute matting) require mulch in order to prevent erosion because they have a fairly open structure. Blankets typically do not require mulch because they usually provide complete protection of the surface.
- Extremely steep, unstable, wet, or rocky slopes are often appropriate candidates for use of synthetic blankets, as are riverbanks, beaches and other high-energy environments. If synthetic blankets are used, the soil should be hydromulched first.

- 100-percent biodegradable blankets are available for use in sensitive areas. These organic blankets are usually held together with a paper or fiber mesh and stitching which may last up to a year.
- Most netting used with blankets is photodegradable, meaning it breaks down under sunlight (not UV stabilized). However, this process can take months or years even under bright sun. Once vegetation is established, sunlight does not reach the mesh. It is not uncommon to find non-degraded netting still in place several years after installation. This can be a problem if maintenance requires the use of mowers or ditch cleaning equipment. In addition, birds and small animals can become trapped in the netting.

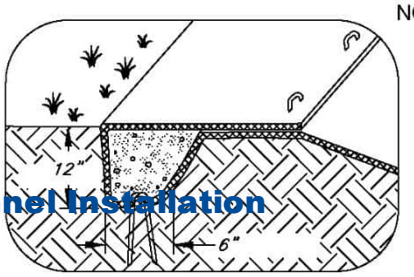
Maintenance Standards

- Maintain good contact with the ground. Erosion must not occur beneath the net or blanket.
- Repair and staple any areas of the net or blanket that are damaged or not in close contact with the ground.
- Fix and protect eroded areas if erosion occurs due to poorly controlled drainage.

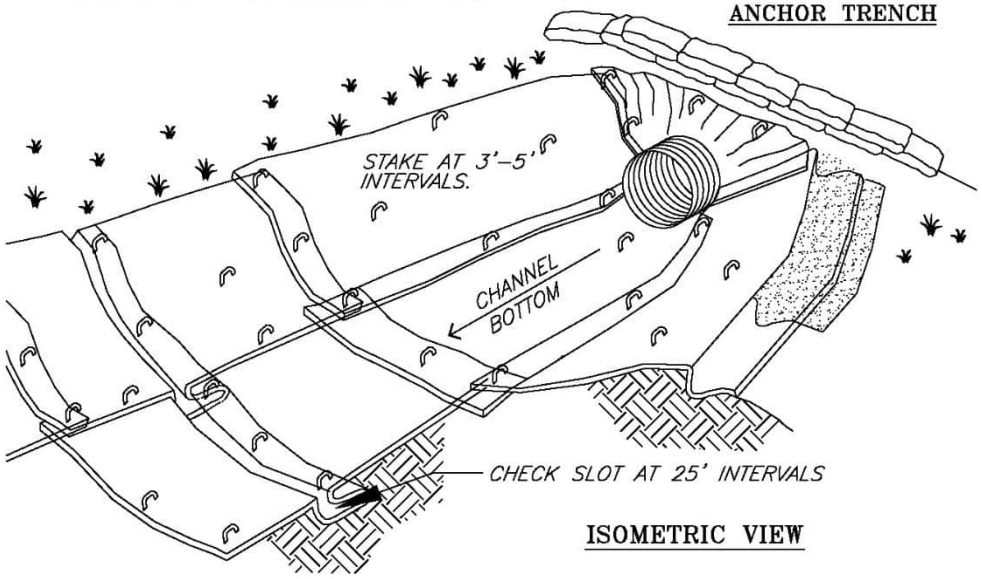
NOT TO SCALE



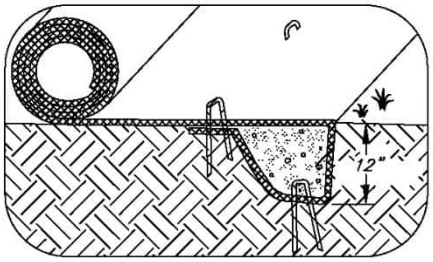
LONGITUDINAL ANCHOR TRENCH



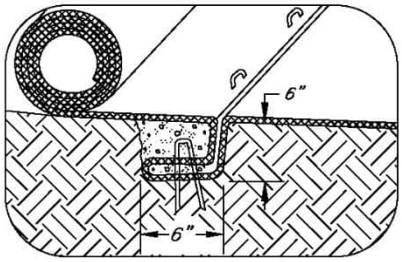
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH



INTERMITTENT CHECK SLOT

Notes:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.

(Clackamas County et al., 2008)

DEPARTMENT OF ECOLOGY
State of Washington

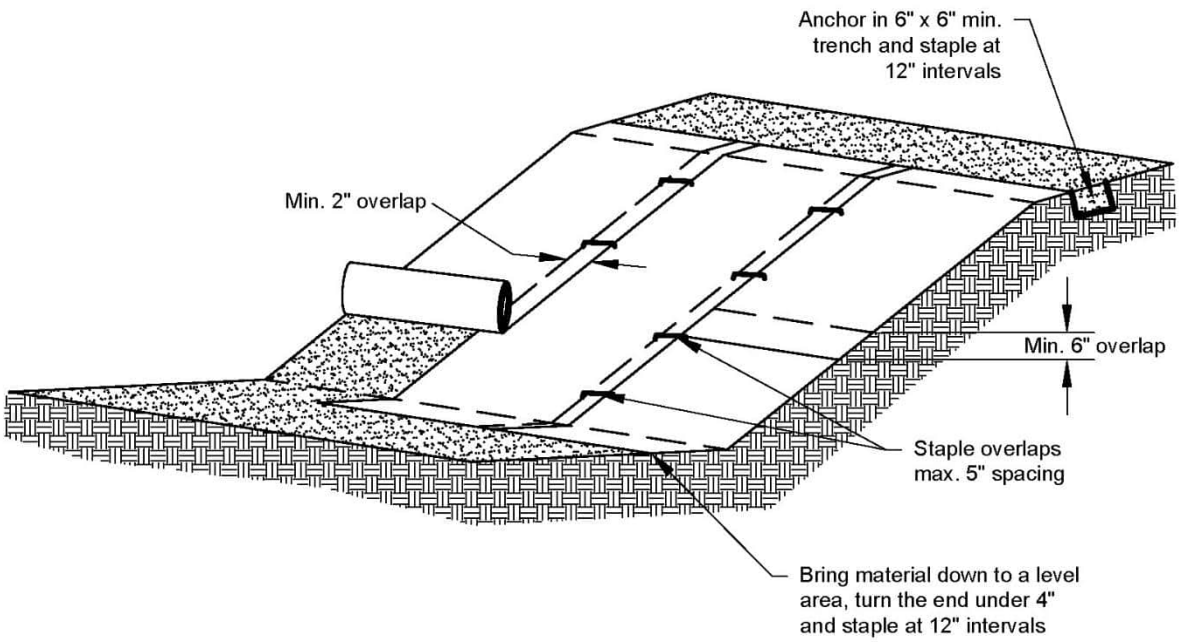
Channel Installation

Revised July 2016

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Figure II-3.3: Channel Installation

Figure II-3.4: Slope Installation



Notes:

1. Slope surface shall be smooth before placement for proper soil contact.
2. Stapling pattern as per manufacturer's recommendations.
3. Do not stretch blankets/mattings tight - allow the rolls to mold to any irregularities.
4. For slopes less than 3H:1V, rolls may be placed in horizontal strips.
5. If there is a berm at the top of the slope, anchor upslope of the berm.
6. Lime, fertilize, and seed before installation. Planting of shrubs, trees, etc. should occur after installation.

NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Slope Installation

Revised June 2016

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BMP C123: Plastic Covering

Purpose

Plastic covering provides immediate, short-term erosion protection to slopes and disturbed areas.

Conditions of Use

Plastic covering may be used on disturbed areas that require cover measures for less than 30 days, except as stated below.

- Plastic is particularly useful for protecting cut and fill slopes and stockpiles. However, the relatively rapid breakdown of most polyethylene sheeting makes it unsuitable for applications greater than six months.
- Due to rapid runoff caused by plastic covering, do not use this method upslope of areas that might be adversely impacted by concentrated runoff. Such areas include steep and/or unstable slopes.
- Plastic sheeting may result in increased runoff volumes and velocities, requiring additional on- site measures to counteract the increases. Creating a trough with wattles or other material can convey clean water away from these areas.
- To prevent undercutting, trench and backfill rolled plastic covering products.
- Although the plastic material is inexpensive to purchase, the cost of installation, maintenance, removal, and disposal add to the total costs of this BMP.
- Whenever plastic is used to protect slopes, install water collection measures at the base of the slope. These measures include plastic-covered berms, channels, and pipes used to convey clean rainwater away from bare soil and disturbed areas. Do not mix clean runoff from a plastic covered slope with dirty runoff from a project.

- Other uses for plastic include:

    - Temporary ditch liner.
    - Pond liner in temporary sediment pond.
    - Liner for bermed temporary fuel storage area if plastic is not reactive to the type of fuel being stored.
    - Emergency slope protection during heavy rains.
    - Temporary drainpipe (“elephant trunk”) used to direct water.

Design and Installation Specifications

- Plastic slope cover must be installed as follows:

    1. Run plastic up and down the slope, not across the slope.
    2. Plastic may be installed perpendicular to a slope if the slope length is less than 10 feet.
    3. Provide a minimum of 8-inch overlap at the seams.
    4. On long or wide slopes, or slopes subject to wind, tape all seams.
    5. Place plastic into a small (12-inch wide by 6-inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.
    6. Place sand filled burlap or geotextile bags every 3 to 6 feet along seams and tie them together with twine to hold them in place.
    7. Inspect plastic for rips, tears, and open seams regularly and repair immediately. This prevents high velocity runoff from contacting bare soil, which causes extreme erosion.
    8. Sandbags may be lowered into place tied to ropes. However, all sandbags must be staked in place.

- Plastic sheeting shall have a minimum thickness of 0.06 millimeters.
- If erosion at the toe of a slope is likely, a gravel berm, riprap, or other suitable protection shall be installed at the toe of the slope in order to reduce the velocity of runoff.

Maintenance Standards

- Torn sheets must be replaced and open seams repaired.
- Completely remove and replace the plastic if it begins to deteriorate due to ultraviolet radiation.
- Completely remove plastic when no longer needed.
- Dispose of old tires used to weight down plastic sheeting appropriately.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C140: Dust Control

Purpose

Dust control prevents wind transport of dust from disturbed soil surfaces onto roadways, drainage ways, and surface waters.

Conditions of Use

Use dust control in areas (including roadways) subject to surface and air movement of dust where on-site or off-site impacts to roadways, drainage ways, or surface waters are likely.

Design and Installation Specifications

- Vegetate or mulch areas that will not receive vehicle traffic. In areas where planting, mulching, or paving is impractical, apply gravel or landscaping rock.
- Limit dust generation by clearing only those areas where immediate activity will take place, leaving the remaining area(s) in the original condition. Maintain the original ground cover as long as practical.
- Construct natural or artificial windbreaks or windscreens. These may be designed as enclosures for small dust sources.
- Sprinkle the site with water until the surface is wet. Repeat as needed. To prevent carryout of mud onto the street, refer to BMP C105: Stabilized Construction Access and BMP C106: Wheel Wash.
- Irrigation water can be used for dust control. Irrigation systems should be installed as a first step on sites where dust control is a concern.
- Spray exposed soil areas with a dust palliative, following the manufacturer's instructions and cautions regarding handling and application. Used oil is prohibited from use as a dust

suppressant. Local governments may approve other dust palliatives such as calcium chloride or PAM.

- PAM (BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection) added to water at a rate of 0.5 pounds per 1,000 gallons of water per acre and applied from a water truck is more effective than water alone. This is due to increased infiltration of water into the soil and reduced evaporation. In addition, small soil particles are bonded together and are not as easily trans- ported by wind. Adding PAM may reduce the quantity of water needed for dust control. Note that the application rate specified here applies to this BMP, and is not the same application rate that is specified in BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection, but the downstream protections still apply.

Refer to

BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body.

- Contact your local Air Pollution Control Authority for guidance and training on other dust control measures. Compliance with the local Air Pollution Control Authority constitutes compliance with this BMP.
- Use vacuum street sweepers.
- Remove mud and other dirt promptly so it does not dry and then turn into dust.
- Techniques that can be used for unpaved roads and lots include:
    - Lower speed limits. High vehicle speed increases the amount of dust stirred up from unpaved roads and lots.
    - Upgrade the road surface strength by improving particle size, shape, and mineral types that make up the surface and base materials.
    - Add surface gravel to reduce the source of dust emission. Limit the amount of fine particles (those smaller than .075 mm) to 10 to 20 percent.
    - Use geotextile fabrics to increase the strength of new roads or roads undergoing reconstruction.
    - Encourage the use of alternate, paved routes, if available.
    - Apply chemical dust suppressants using the admix method, blending the product with the top few inches of surface material. Suppressants may also be applied as surface treatments.
    - Limit dust-causing work on windy days.
    - Pave unpaved permanent roads and other trafficked areas.

Maintenance Standards

Respray area as necessary to keep dust to a minimum.

BMP C152: Sawcutting and Surfacing Pollution Prevention

Purpose

Sawcutting and surfacing operations generate slurry and process water that contains fine particles and high pH (concrete cutting), both of which can violate the water quality standards in the receiving water. Concrete spillage or concrete discharge to waters of the State is prohibited. Use this BMP to minimize and eliminate process water and slurry created through sawcutting or surfacing from entering waters of the State.

Conditions of Use

Utilize these management practices anytime sawcutting or surfacing operations take place. Sawcutting and surfacing operations include, but are not limited to:

- Sawing
- Coring
- Grinding
- Roughening
- Hydro-demolition
- Bridge and road surfacing

Design and Installation Specifications

- Vacuum slurry and cuttings during cutting and surfacing operations.
- Slurry and cuttings shall not remain on permanent concrete or asphalt pavement overnight.
- Slurry and cuttings shall not drain to any natural or constructed drainage conveyance including stormwater systems. This may require temporarily blocking catch basins.
- Dispose of collected slurry and cuttings in a manner that does not violate ground water or surface water quality standards.
- Do not allow process water generated during hydro-demolition, surface roughening or similar operations to drain to any natural or constructed drainage conveyance including stormwater systems. Dispose of process water in a manner that does not violate ground water or surface water quality standards.
- Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. Dispose of sweeping material from a pick-up sweeper at an appropriate disposal site.

Maintenance Standards

Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the state. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and/or vacuum trucks.

BMP C203: Water Bars

Purpose

A water bar is a small ditch or ridge of material that is constructed diagonally across a road or right- of-way to divert stormwater runoff from the road surface, wheel tracks, or a shallow road ditch. See Figure II-3.12: Water Bar.

Conditions of Use

Clearing right-of-way and construction of access for power lines, pipelines, and other similar installations often require long narrow right-of-ways over sloping terrain. Disturbance and compaction pro- motes gully formation in these cleared strips by increasing the volume and velocity of runoff. Gully formation may be especially severe in tire tracks and ruts. To prevent gullying, runoff can often be diverted across the width of the right-of-way to undisturbed areas by using small predesigned diversions.

Give special consideration to each individual outlet area, as well as to the cumulative effect of added diversions. Use gravel to stabilize the diversion where significant vehicular traffic is anticipated.

Design and Installation Specifications

- Height: 8-inch minimum, measured from the channel bottom to the ridge top.
- Side slope of channel: 2H:1V maximum; 3H:1V or flatter when vehicles will cross.
- Top width of ridge: 6-inch minimum.
- Locate water bars to use natural drainage systems and to discharge into well vegetated stable areas.
- See Table II-3.9: Water Bar Spacing Guidelines:

Table II-3.9: Water Bar Spacing Guidelines

Slope Along Road (%)	Spacing (ft)
< 5	125
5 - 10	100
10 - 20	75
20 - 35	50
> 35	Use rock lined ditch

Grade of water bar and angle: Select an angle that results in a ditch slope less than 2 percent.

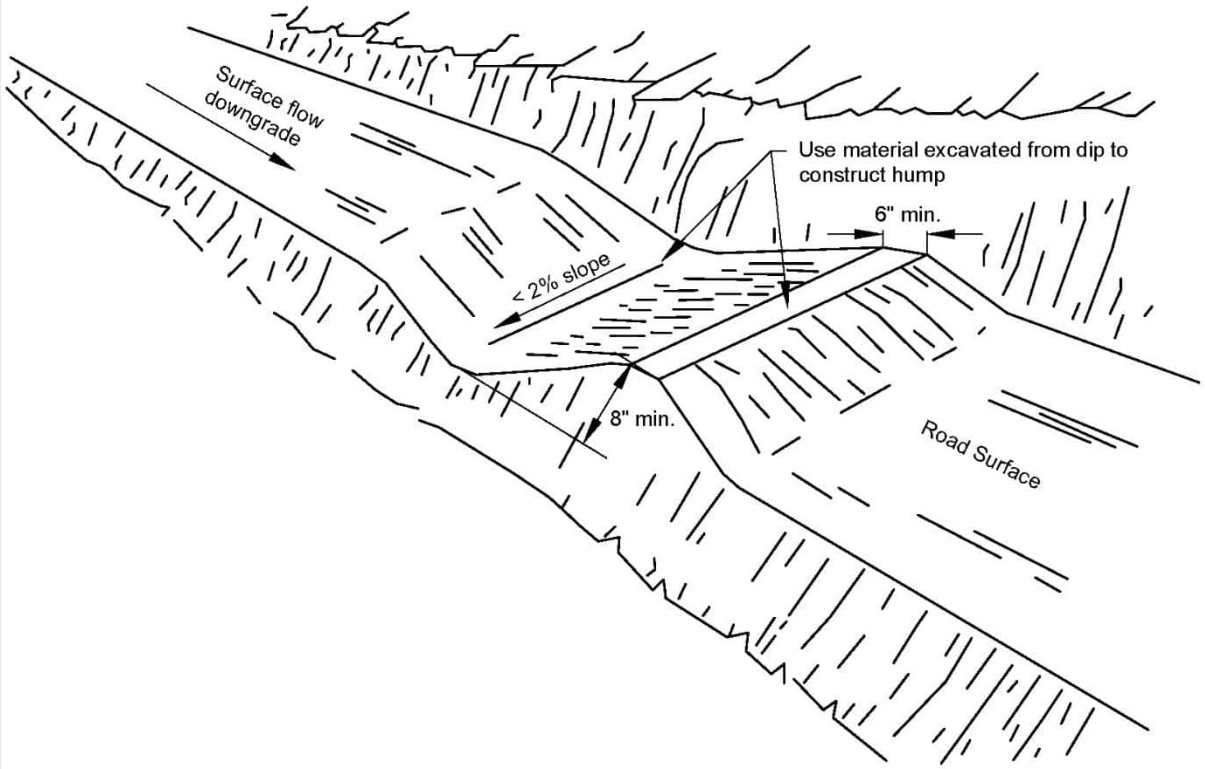
- Install the water bar as soon as the clearing and grading is complete. When utilities are being installed, reconstruct the water bar as construction is complete in each section.
- Compact the water bar ridge.
- Stabilize, seed, and mulch the portions that are not subject to traffic. Gravel the areas crossed by vehicles.
- Note that BMP C208: Triangular Silt Dike (TSD) can be used to create the ridge for the water bar.

Maintenance Standards

Periodically inspect water bars after every heavy rainfall for wear and erosion damage.

- Immediately remove sediment from the flow area and repair the dike.
- Check outlet areas and make timely repairs as needed.
- When permanent road drainage is established and the area above the temporary water bar is permanently stabilized, remove the dikes and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.

Figure II-3.12: Water Bar



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Water Bar

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BMP C209: Outlet Protection

Purpose

Outlet protection prevents scour at conveyance outlets and minimizes the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions of Use

Use outlet protection at the outlets of all ponds, pipes, ditches, or other conveyances that discharge to a natural or manmade drainage feature such as a stream, wetland, lake, or ditch.

Design and Installation Specifications

- The receiving channel at the outlet of a pipe shall be protected from erosion by lining a minimum of 6 feet downstream and extending up the channel sides a minimum of 1–foot above the maximum tailwater elevation, or 1-foot above the crown, whichever is higher. For pipes lar- ger than 18 inches in diameter, the outlet protection lining of the channel shall be four times the diameter of the outlet pipe.
- Standard wingwalls, tapered outlets, and paved channels should also be considered when appropriate for permanent culvert outlet protection (WSDOT, 2015).
- BMP C122: Nets and Blankets or BMP C202: Riprap Channel Lining provide suitable options for lining materials.
- With low flows, BMP C201: Grass-Lined Channels can be an effective alternative for lining material.
- The following guidelines shall be used for outlet protection with riprap:.
    - If the discharge velocity at the outlet is less than 5 fps, use 2-inch to 8-inch riprap. Minimum thickness is 1-foot.
    - For 5 to 10 fps discharge velocity at the outlet, use 24-inch to 48-inch riprap. Minimum thickness is 2 feet.
    - For outlets at the base of steep slope pipes (pipe slope greater than 10 percent), use an engineered energy dissipator.
    - Filter fabric or erosion control blankets should always be used under riprap to prevent scour and channel erosion. See BMP C122: Nets and Blankets.
- Bank stabilization, bioengineering, and habitat features may be required for disturbed areas. This work may require a Hydraulic Project Approval (HPA) from the Washington State Department of Fish and Wildlife. See I-2.11 Hydraulic Project Approvals.

Maintenance Standards

- Inspect and repair as needed.
- Add rock as needed to maintain the intended function.
- Clean energy dissipator if sediment builds up.

BMP C220: Inlet Protection

Purpose

Inlet protection prevents coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use

Use inlet protection at inlets that are operational before permanent stabilization of the disturbed areas that contribute runoff to the inlet. Provide protection for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless those inlets are preceded by a sediment trapping BMP.

Also consider inlet protection for lawn and yard drains on new home construction. These small and numerous drains coupled with lack of gutters can add significant amounts of sediment into the roof drain system. If possible, delay installing lawn and yard drains until just before landscaping, or cap these drains to prevent sediment from entering the system until completion of landscaping. Provide 18-inches of sod around each finished lawn and yard drain.

Table II-3.10: Storm Drain Inlet Protection

lists several options for inlet protection. All of the methods for inlet protection tend to plug and require a high frequency of maintenance. Limit contributing drain- age areas for an individual inlet to one acre or less. If possible, provide emergency overflows with additional end-of-pipe treatment where stormwater ponding would cause a hazard.

Table II-3.10: Storm Drain Inlet Protection

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding may occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area requirement: 30'x30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No	Paved or Earthen	Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.

Culvert Inlet Protection			
Culvert inlet sediment trap	N/A	N/A	18 month expected life.

Design and Installation Specifications

Excavated Drop Inlet Protection

Excavated drop inlet protection consists of an excavated impoundment around the storm drain inlet. Sediment settles out of the stormwater prior to entering the storm drain. Design and installation specifications for excavated drop inlet protection include:

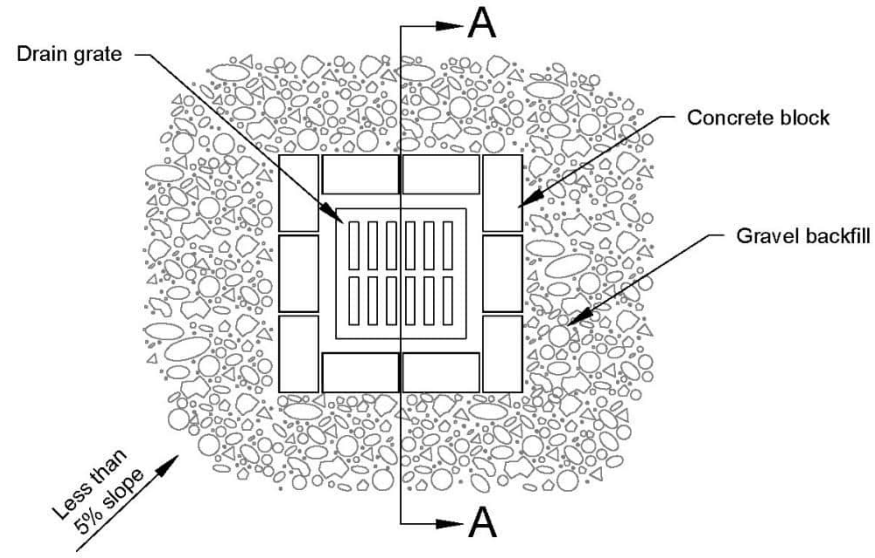
- Provide a depth of 1-2 ft as measured from the crest of the inlet structure.
- Slope sides of excavation should be no steeper than 2H:1V.
- Minimum volume of excavation is 35 cubic yards.
- Shape the excavation to fit the site, with the longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- Build a temporary dike, if necessary, to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter

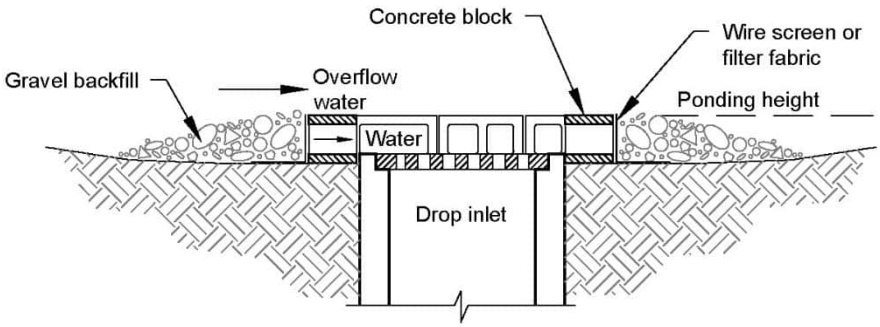
A block and gravel filter is a barrier formed around the inlet with standard concrete blocks and gravel. See Figure II-3.17: Block and Gravel Filter. Design and installation specifications for block gravel filters include:

- Provide a height of 1 to 2 feet above the inlet.
- Recess the first row of blocks 2-inches into the ground for stability.
- Support subsequent courses by placing a pressure treated wood 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side to allow for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel to just below the top of blocks on slopes of 2H:1V or flatter.
- An alternative design is a gravel berm surrounding the inlet, as follows:
    - Provide a slope of 3H:1V on the upstream side of the berm.
    - Provide a slope of 2H:1V on the downstream side of the berm.
    - Provide a 1-foot wide level stone area between the gravel berm and the inlet.
    - Use stones 3 inches in diameter or larger on the upstream slope of the berm.
    - Use gravel ½- to ¾-inch at a minimum thickness of 1-foot on the downstream slope of the berm.

Figure II-3.17: Block and Gravel Filter



Plan View



Section A-A

Notes:

1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the downslope side of the structure.

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Block and Gravel Filter

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Gravel and Wire Mesh Filter

Gravel and wire mesh filters are gravel barriers placed over the top of the inlet. This method does not provide an overflow. Design and installation specifications for gravel and wire mesh filters include:

- Use a hardware cloth or comparable wire mesh with ½-inch openings.
    - Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
    - Overlap the strips if more than one strip of mesh is necessary.

- Place coarse aggregate over the wire mesh.
    - Provide at least a 12-inch depth of aggregate over the entire inlet opening and extend at least 18-inches on all sides.

Catch Basin Filters

Catch basin filters are designed by manufacturers for construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. To reduce maintenance requirements, combine a catch basin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way. Design and installation specifications for catch basin filters include:

- Provides 5 cubic feet of storage.
- Requires dewatering provisions.
- Provides a high-flow bypass that will not clog under normal use at a construction site.
- Insert the catch basin filter in the catch basin just below the grating.

Curb Inlet Protection with Wooden Weir

Curb inlet protection with wooden weir is an option that consists of a barrier formed around a curb inlet with a wooden frame and gravel. Design and installation specifications for curb inlet protection with wooden weirs include:

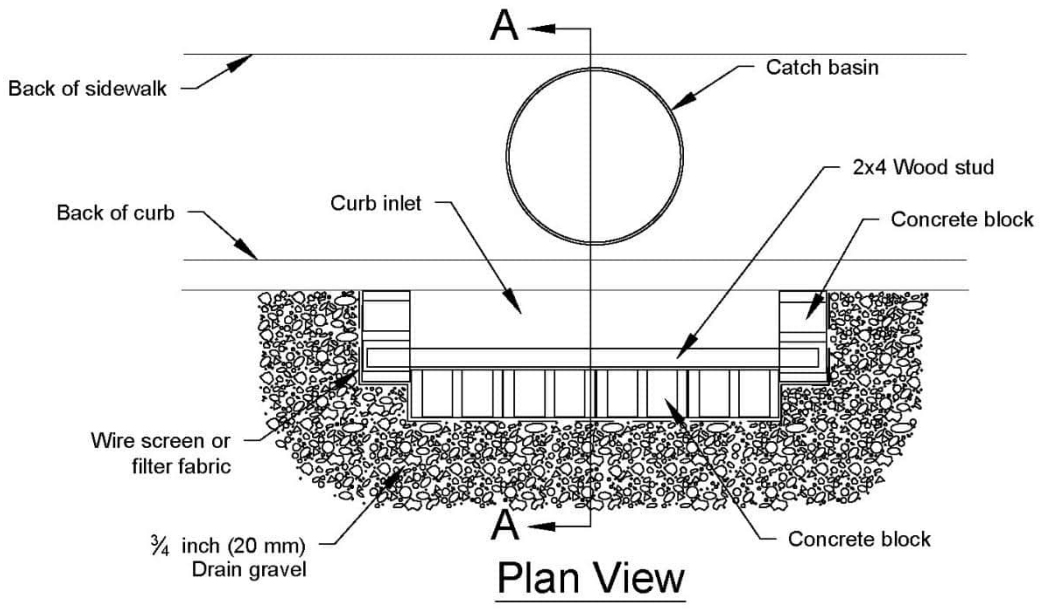
- Use wire mesh with ½-inch openings.
- Use extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against the wire and fabric.
- Place weight on the frame anchors.

Block and Gravel Curb Inlet Protection

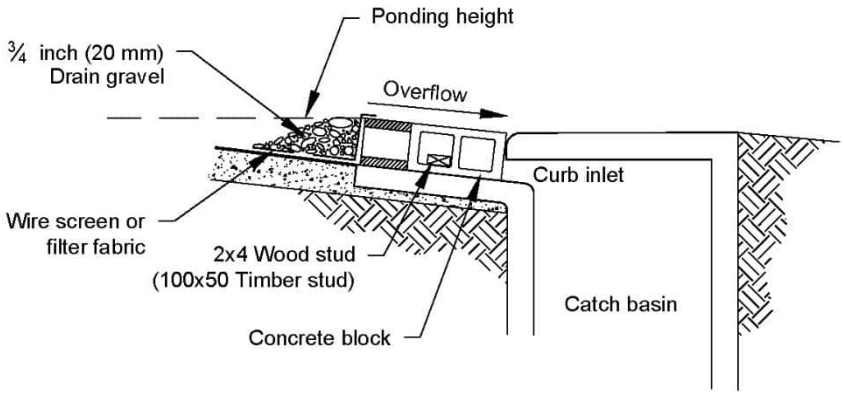
Block and gravel curb inlet protection is a barrier formed around a curb inlet with concrete blocks and gravel. See Figure II-3.18: Block and Gravel Curb Inlet Protection. Design and installation specifications for block and gravel curb inlet protection include:

- Use wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

Figure II-3.18: Block and Gravel Curb Inlet Protection



Plan View



Section A-A

Notes:

1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Block and Gravel Curb Inlet Protection

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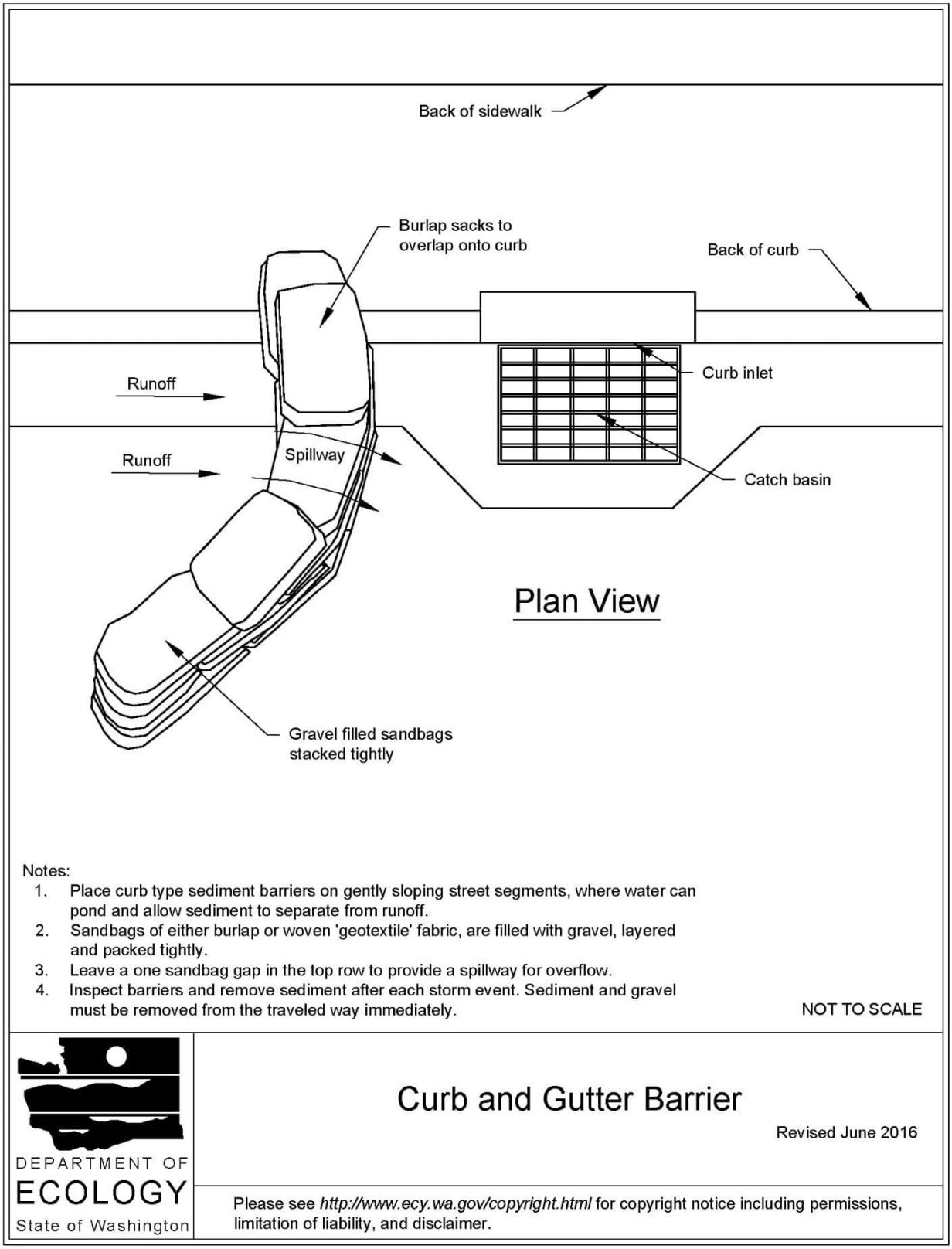
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Curb and Gutter Sediment Barrier

Curb and gutter sediment barrier is a sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure II-3.19: Curb and Gutter Barrier. Design and installation specifications for curb and gutter sediment barrier include:

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the upstream side of the berm. Size the trap to sediment trap standards for protecting a culvert inlet.

Figure II-3.19: Curb and Gutter Barrier



Notes:

1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

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Curb and Gutter Barrier

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Maintenance Standards

- Inspect all forms of inlet protection frequently, especially after storm events. Clean and replace clogged catch basin filters. For rock and gravel filters, pull away the rocks from the inlet and clean or replace. An alternative approach would be to use the clogged rock as fill and put fresh rock around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

BMP C233: Silt Fence

Purpose

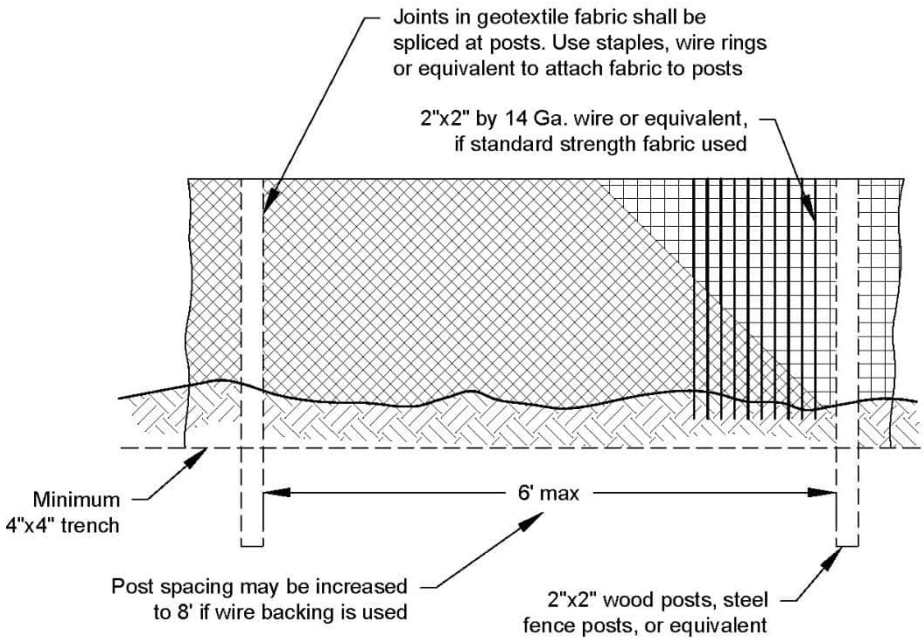
Silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow.

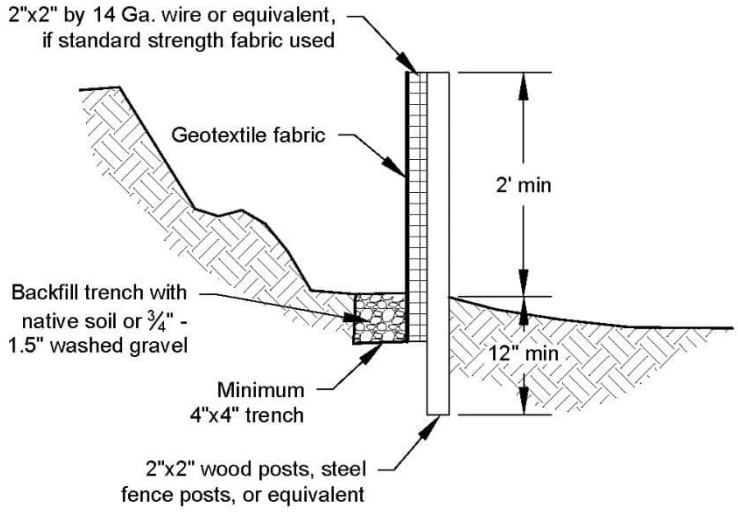
Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence shall prevent sediment carried by runoff from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.
- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow. Convey any concentrated flows through the drainage system to a sediment trapping BMP.
- Do not construct silt fences in streams or use in V-shaped ditches. Silt fences do not provide an adequate method of silt control for anything deeper than sheet or overland flow.

Figure II-3.22: Silt Fence





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Silt Fence

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Design and Installation Specifications

- Use in combination with other construction stormwater BMPs.
- Maximum slope steepness (perpendicular to the silt fence line) 1H:1V.
- Maximum sheet or overland flow path length to the silt fence of 100 feet.
- Do not allow flows greater than 0.5 cfs.
- Use geotextile fabric that meets the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table I-3.11: Geotextile Fabric Standards for Silt Fence):

Table II-3.11: Geotextile Fabric Standards for Silt Fence

Geotextile Property	Minimum Average Roll Value
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film woven (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Support standard strength geotextiles with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the geotextile. Silt fence materials are available that have synthetic mesh backing attached.
- Silt fence material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F to 120°F.
- One-hundred percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by the local jurisdiction.
- Refer to Figure II-3.22: Silt Fence for standard silt fence details. Include the following Standard Notes for silt fence on construction plans and specifications:

1. The Contractor shall install and maintain temporary silt fences at the locations shown in the Plans.
2. Construct silt fences in areas of clearing, grading, or drainage prior to starting those activities.
3. The silt fence shall have a 2-feet min. and a 2½-feet max. height above the original ground surface.
4. The geotextile fabric shall be sewn together at the point of manufacture to form fabric lengths as required. Locate all sewn seams at support posts. Alternatively, two sections of silt fence can be overlapped, provided that the overlap is long enough and that the adjacent silt fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

5. Attach the geotextile fabric on the up-slope side of the posts and secure with staples, wire, or in accordance with the manufacturer's recommendations. Attach the geotextile fabric to the posts in a manner that reduces the potential for tearing.
6. Support the geotextile fabric with wire or plastic mesh, dependent on the properties of the geotextile selected for use. If wire or plastic mesh is used, fasten the mesh securely to the up-slope side of the posts with the geotextile fabric up-slope of the mesh.
7. Mesh support, if used, shall consist of steel wire with a maximum mesh spacing of 2-inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to the same level of ultraviolet radiation as the geotextile fabric it supports.
8. Bury the bottom of the geotextile fabric 4-inches min. below the ground surface. Backfill and tamp soil in place over the buried portion of the geotextile fabric, so that no flow can pass beneath the silt fence and scouring cannot occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the ground 3-inches min.
9. Drive or place the silt fence posts into the ground 18-inches min. A 12–inch min. depth is allowed if topsoil or other soft subgrade soil is not present and 18-inches cannot be reached. Increase fence post min. depths by 6 inches if the fence is located on slopes of 3H:1V or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.
10. Use wood, steel or equivalent posts. The spacing of the support posts shall be a maximum of 6-feet. Posts shall consist of either:

    - Wood with minimum dimensions of 2 inches by 2 inches by 3 feet. Wood shall be free of defects such as knots, splits, or gouges.
    - No. 6 steel rebar or larger.
    - ASTM A 120 steel pipe with a minimum diameter of 1-inch.
    - U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft.
    - Other steel posts having equivalent strength and bending resistance to the post sizes listed above.

11. Locate silt fences on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.
12. If the fence must cross contours, with the exception of the ends of the fence, place check dams perpendicular to the back of the fence to minimize concentrated flow and erosion. The slope of the fence line where contours must be crossed shall not be steeper than 3H:1V.

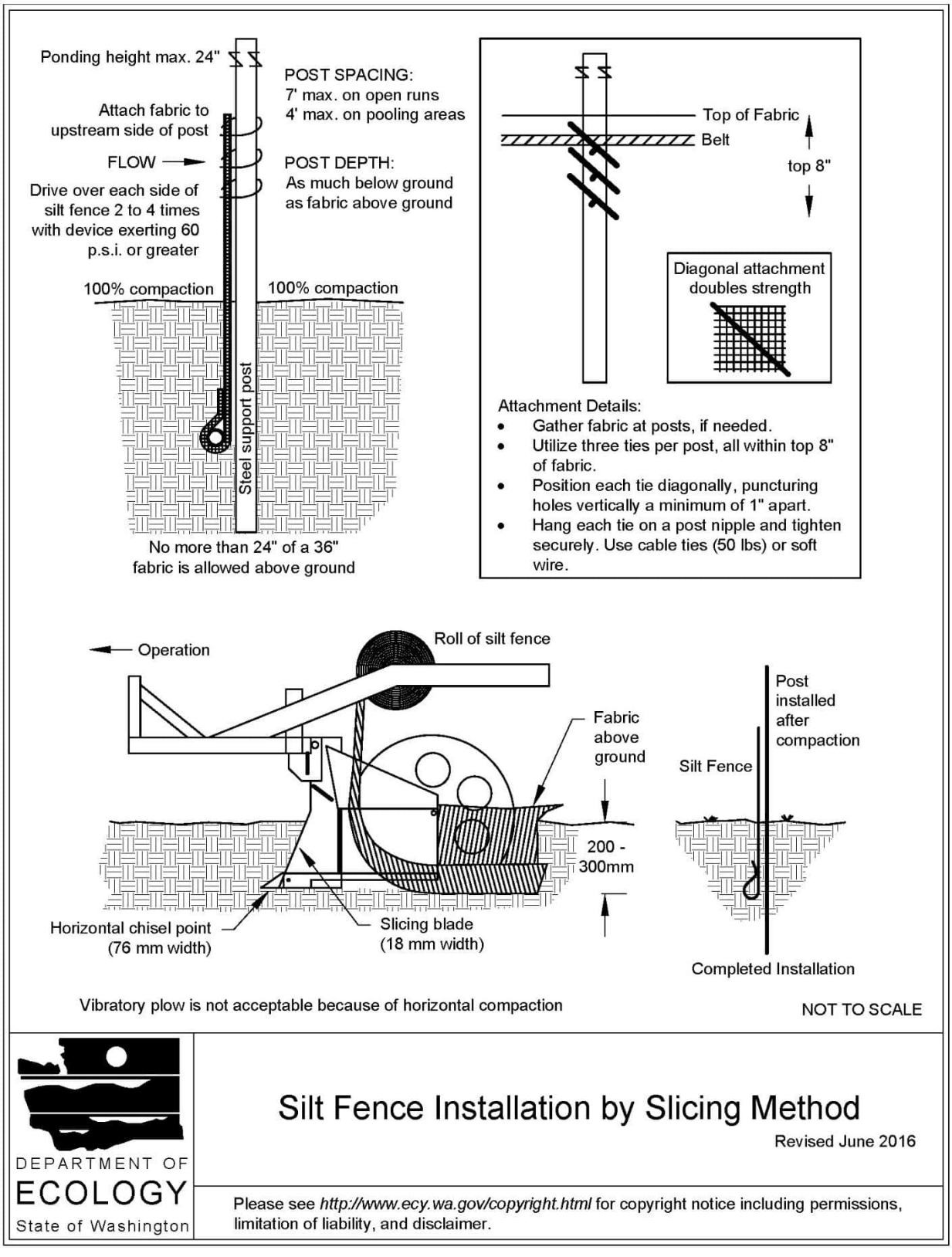
    - Check dams shall be approximately 1-foot deep at the back of the fence. Check dams shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence.
    - Check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. Check dams shall be located every 10 feet along the fence where the fence must cross contours.

- Refer to Figure II-3.23: Silt Fence Installation by Slicing Method for slicing method details. The following are specifications for silt fence installation using the slicing method:

1. The base of both end posts must be at least 2- to 4-inches above the top of the geo- textile fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

2. Install posts 3- to 4-feet apart in critical retention areas and 6- to 7-feet apart in standard applications.
3. Install posts 24-inches deep on the downstream side of the silt fence, and as close as possible to the geotextile fabric, enabling posts to support the geotextile fabric from upstream water pressure.
4. Install posts with the nipples facing away from the geotextile fabric.
5. Attach the geotextile fabric to each post with three ties, all spaced within the top 8- inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1-inch vertically apart. Each tie should be positioned to hang on a post nipple when tightening to prevent sagging.
6. Wrap approximately 6-inches of the geotextile fabric around the end posts and secure with 3 ties.
7. No more than 24-inches of a 36-inch geotextile fabric is allowed above ground level.
8. Compact the soil immediately next to the geotextile fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips. Check and correct the silt fence installation for any deviation before compaction. Use a flat-bladed shovel to tuck the fabric deeper into the ground if necessary.

Figure II-3.23: Silt Fence Installation by Slicing Method



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Maintenance Standards

- Repair any damage immediately.
- Intercept and convey all evident concentrated flows uphill of the silt fence to a sediment trapping BMP.
- Check the uphill side of the silt fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence and remove the trapped sediment.
- Remove sediment deposits when the deposit reaches approximately one-third the height of the silt fence, or install a second silt fence.
- Replace geotextile fabric that has deteriorated due to ultraviolet breakdown.

BMP C235: Wattles

Purpose

Wattles are temporary erosion and sediment control barriers consisting of straw, compost, or other material that is wrapped in netting made of natural plant fiber or similar encasing material. They reduce the velocity and can spread the flow of rill and sheet runoff, and can capture and retain sediment.

Conditions of Use

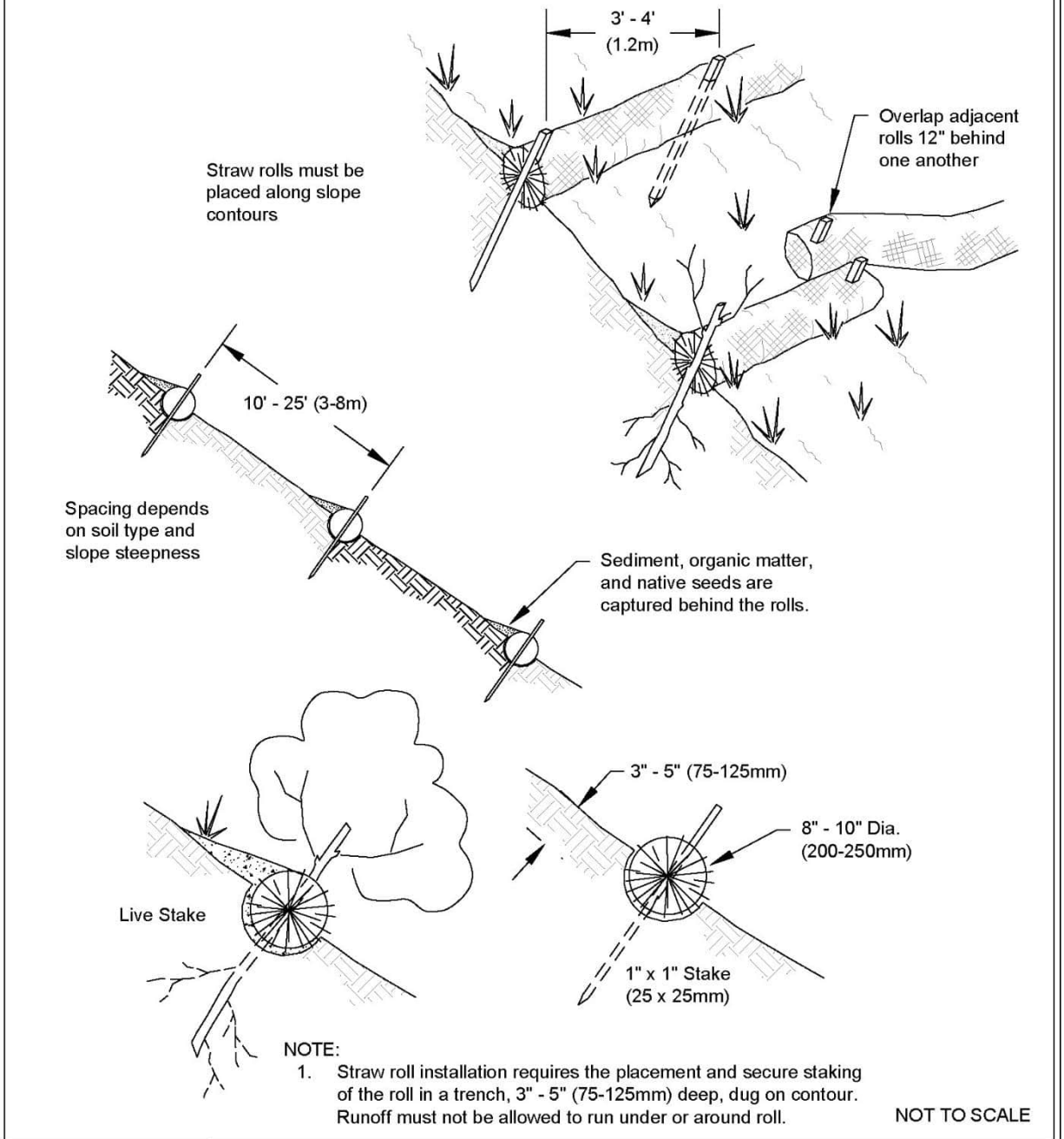
- Wattles shall consist of cylinders of plant material such as weed-free straw, coir, wood chips, excelsior, or wood fiber or shavings encased within netting made of natural plant fibers unaltered by synthetic materials.
- Use wattles:
    - In disturbed areas that require immediate erosion protection.
    - On exposed soils during the period of short construction delays, or over winter months.
    - On slopes requiring stabilization until permanent vegetation can be established.
- The material used dictates the effectiveness period of the wattle. Generally, wattles are effective for one to two seasons.
- Prevent rilling beneath wattles by entrenching and overlapping wattles to prevent water from passing between them.

Design Criteria

- See Figure II-3.24: Wattles for typical construction details.
- Wattles are typically 8 to 10 inches in diameter and 25 to 30 feet in length.
- Install wattles perpendicular to the flow direction and parallel to the slope contour.
- Place wattles in shallow trenches, staked along the contour of disturbed or newly constructed slopes. Dig narrow trenches across the slope (on contour) to a depth of 3- to 5-inches on clay soils and soils with gradual slopes. On loose soils, steep slopes, and areas with high rainfall, the trenches should be dug to a depth of 5- to 7- inches, or 1/2 to 2/3 of the thickness of the wattle.
- Start building trenches and installing wattles from the base of the slope and work up. Spread excavated material evenly along the uphill slope and compact it using hand tamping or other methods.
- Construct trenches at intervals of 10- to 25-feet depending on the steepness of the slope, soil type, and rainfall. The steeper the slope the closer together the trenches.

- Install the wattles snugly into the trenches and overlap the ends of adjacent wattles 12 inches behind one another.
- Install stakes at each end of the wattle, and at 4-foot centers along entire length of wattle.
- If required, install pilot holes for the stakes using a straight bar to drive holes through the wattle and into the soil.
- Wooden stakes should be approximately 0.75 x 0.75 x 24 inches min. Willow cuttings or 3/8-inch rebar can also be used for stakes.
- Stakes should be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle.

Figure II-3.24: Wattles



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State of Washington

Wattles

Revised December 2016

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Maintenance Standards

- Wattles may require maintenance to ensure they are in contact with soil and thoroughly entrenched, especially after significant rainfall on steep sandy soils.
- Inspect the slope after significant storms and repair any areas where wattles are not tightly abutted or water has scoured beneath the wattles.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

Alternative Construction Stormwater BMPs

BMP C106: Wheel Wash

Purpose

Wheel washes reduce the amount of sediment transported onto paved roads by washing dirt from the wheels of motor vehicles prior to the motor vehicles leaving the construction site.

Conditions of Use

- Use a wheel wash when BMP C105: Stabilized Construction Access is not preventing sediment from being tracked off site.
- Wheel washing is generally an effective BMP when installed with careful attention to topography. For example, a wheel wash can be detrimental if installed at the top of a slope abutting a right-of-way where the water from the dripping truck can run unimpeded into the street.
- Pressure washing combined with an adequately sized and surfaced pad with direct drainage to a large 10-foot x 10-foot sump can be very effective.
- Wheel wash wastewater is not stormwater. It is commonly called process water, and must be discharged to a separate on-site treatment system that prevents discharge to waters of the State, or to the sanitary sewer with local sewer district approval.
- Wheel washes may use closed-loop recirculation systems to conserve water use.
- Wheel wash wastewater shall not include wastewater from concrete washout areas.
- When practical, the wheel wash should be placed in sequence with BMP C105: Stabilized Construction Access. Locate the wheel wash such that vehicles exiting the wheel wash will enter directly onto BMP C105: Stabilized Construction Access. In order to achieve this, BMP C105: Stabilized Construction Access may need to be extended beyond the standard installation to meet the exit of the wheel wash.

Design and Installation Specifications

Suggested details are shown in Figure II-3.2: Wheel Wash. The Local Permitting Authority may allow other designs. A minimum of 6 inches of asphalt treated base (ATB) over crushed base material or 8 inches over a good subgrade is recommended to pave the wheel wash.

Use a low clearance truck to test the wheel wash before paving. Either a belly dump or lowboy will work well to test clearance.

Keep the water level from 12 to 14 inches deep to avoid damage to truck hubs and filling the truck tongues with water.

Midpoint spray nozzles are only needed in extremely muddy conditions.

Wheel wash systems should be designed with a small grade change, 6- to 12-inches for a 10-foot-wide pond, to allow sediment to flow to the low side of pond to help prevent re-suspension of sediment. A drainpipe with a 2- to 3-foot riser should be installed on the low side of the pond to allow for easy cleaning and refilling. Polymers may be used to promote coagulation and flocculation in a closed-loop system. Polyacrylamide (PAM) added to the wheel wash water at a rate of 0.25 - 0.5 pounds per 1,000 gallons of water increases effectiveness and reduces cleanup time. If PAM is already being used for dust or erosion control and is being applied by a water truck, the same truck can be used to change the wash water.

Maintenance Standards

The wheel wash should start out each day with fresh water.

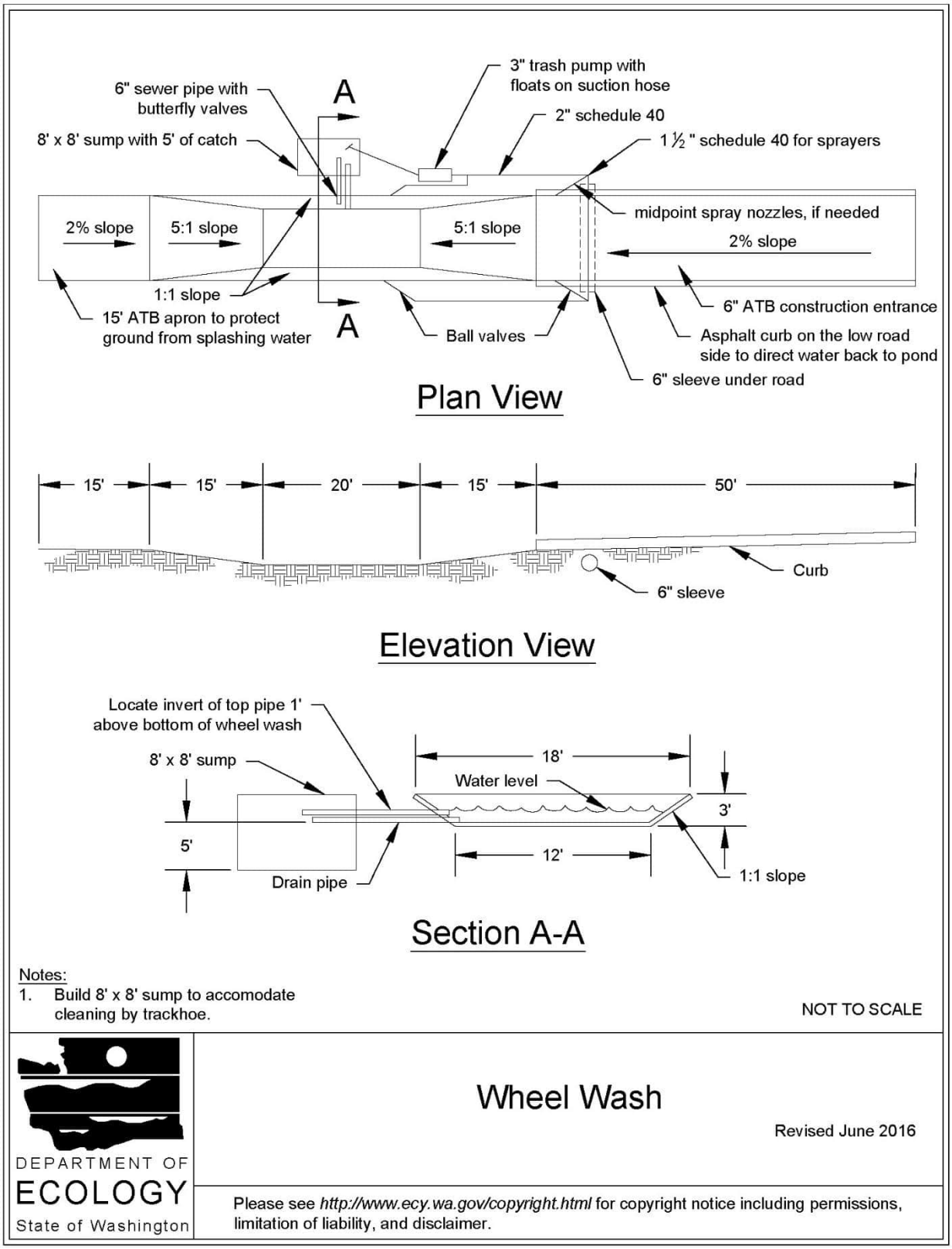
The wheel wash water should be changed a minimum of once per day. On large earthwork jobs where more than 10-20 trucks per hour are expected, the wheel wash water will need to be changed more often.

Approved as Functionally Equivalent

Ecology has approved products as able to meet the requirements of this BMP. The products did not pass through the Technology Assessment Protocol – Ecology (TAPE) process. Local jurisdictions may choose not to accept these products, or may require additional testing prior to consideration for local use. Products that Ecology has approved as functionally equivalent are available for review on Ecology's website at:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-per-mittee-guidance-resources/Emerging-stormwater-treatment-technologies

Figure II-3.2: Wheel Wash



Notes:

1. Build 8' x 8' sump to accomodate cleaning by trackhoe.

NOT TO SCALE

DEPARTMENT OF ECOLOGY
State of Washington

Wheel Wash

Revised June 2016

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BMP C124: Sodding

Purpose

The purpose of sodding is to establish turf for immediate erosion protection and to stabilize drainage paths where concentrated overland flow will occur.

Conditions of Use

Sodding may be used in the following areas:

- Disturbed areas that require short-term or long-term cover.
- Disturbed areas that require immediate vegetative cover.
- All waterways that require vegetative lining. Waterways may also be seeded rather than sodded, and protected with a net or blanket.

Design and Installation Specifications

Sod shall be free of weeds, of uniform thickness (approximately 1-inch thick), and shall have a dense root mat for mechanical strength.

The following steps are recommended for sod installation:

1. Shape and smooth the surface to final grade in accordance with the approved grading plan. Consider any areas (such as swales) that need to be overexcavated below design elevation to allow room for placing soil amendment and sod.
2. Amend 4 inches (minimum) of compost into the top 8 inches of the soil if the organic content of the soil is less than ten percent or the permeability is less than 0.6 inches per hour. See https://ecology.wa.gov/Waste-Toxics/Reducing-recycling-waste/Organic-materials/Managing-organics-compost for further information.
3. Fertilize according to the sod supplier's recommendations.
4. Work lime and fertilizer 1 to 2 inches into the soil, and smooth the surface.
5. Lay strips of sod beginning at the lowest area to be sodded and perpendicular to the direction of water flow. Wedge strips securely into place. Square the ends of each strip to provide for a close, tight fit. Stagger joints at least 12 inches. Staple on slopes steeper than 3H:1V. Staple the upstream edge of each sod strip.
6. Roll the sodded area and irrigate.
7. When sodding is carried out in alternating strips or other patterns, seed the areas between the sod immediately after sodding.

Maintenance Standards

If the grass is unhealthy, the cause shall be determined and appropriate action taken to reestablish a healthy groundcover. If it is impossible to establish a healthy groundcover due to frequent saturation, instability, or some other cause, the sod shall be removed, the area seeded with an appropriate mix, and protected with a net or blanket.

BMP C125: Topsoiling / Composting

Purpose

Topsoiling and composting provide a suitable growth medium for final site stabilization with vegetation. While not a permanent cover practice in itself, topsoiling and composting are an integral com- ponent of providing permanent cover in those areas where there is an unsuitable soil surface for plant growth. Use this BMP in conjunction with other BMPs such as BMP C120: Temporary and Permanent Seeding, BMP C121: Mulching, or BMP C124: Sodding. Implementation of this BMP may meet the post-construction requirements of BMP T5.13: Post-Construction Soil Quality and Depth.

Native soils and disturbed soils that have been organically amended not only retain much more stormwater, but also serve as effective biofilters for urban pollutants and, by supporting more vigorous plant growth, reduce the water, fertilizer and pesticides needed to support installed landscapes. Topsoil does not include any subsoils but only the material from the top several inches including organic debris.

Conditions of Use

- Permanent landscaped areas shall contain healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetative health and vitality, improves hydrologic characteristics, and reduces the need for irrigation.
- Leave native soils and the duff layer undisturbed to the maximum extent practicable. Stripping of existing, properly functioning soil system and vegetation for the purpose of topsoiling during construction is not acceptable. Preserve existing soil systems in undisturbed and uncompacted conditions if functioning properly.
- Areas that already have good topsoil, such as undisturbed areas, do not require soil amendments.
- Restore, to the maximum extent practical, native soils disturbed during clearing and grading to a condition equal to or better than the original site condition's moisture-holding capacity. Use on-site native topsoil, incorporate amendments into on-site soil, or import blended topsoil to meet this requirement.
- Topsoiling is a required procedure when establishing vegetation on shallow soils, and soils of critically low pH (high acid) levels.
- Beware of where the topsoil comes from, and what vegetation was on site before disturbance. Invasive plant seeds may be included and could cause problems for establishing native plants, landscaped areas, or grasses.
  Topsoil from the site will contain mycorrhizal bacteria that are necessary for healthy root growth and nutrient transfer. These native mycorrhiza are acclimated to the site and will provide optimum conditions for establishing grasses. Use commercially available mycorrhiza products when using off-site topsoil.

Design and Installation Specifications

Meet the following requirements for disturbed areas that will be developed as lawn or landscaped areas at the completed project site:

- Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil shall have:

    - A minimum depth of 8-inches. Scarify subsoils below the topsoil layer at least 4-inches with some incorporation of the upper material to avoid stratified layers, where feasible. Ripping or re-structuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system.
    - A minimum organic content of 10% dry weight in planting beds, and 5% organic matter content in turf areas. Incorporate organic amendments to a minimum 8-inch depth except where tree roots or other natural features limit the depth of incorporation.
    - A pH between 6.0 and 8.0 or matching the pH of the undisturbed soil.
    - If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve.
- Mulch planting beds with 2 inches of organic material
- Accomplish the required organic content, depth, and pH by returning native topsoil to the site, importing topsoil of sufficient organic content, and/or incorporating organic amendments. When using the option of incorporating amendments to meet the organic content requirement, use compost that meets the compost specification for Bioretention (See BMP T7.30: Bioretention), with the exception that the compost may have up to 35% biosolids or manure.
- Sections 3 through 7 of *Building Soil: Guidelines and Resources for Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington* (Stenn et al., 2016), provides useful guidance for implementing whichever option is chosen. It includes guidance for pre-approved default strategies and guidance for custom strategies. Check with your local jurisdiction concerning its acceptance of this guidance.
- The final composition and construction of the soil system will result in a natural selection or favoring of certain plant species over time. For example, incorporation of topsoil may favor grasses, while layering with mildly acidic, high-carbon amendments may favor more woody vegetation.
- Allow sufficient time in scheduling for topsoil spreading prior to seeding, sodding, or planting.
- Take care when applying topsoil to subsoils with contrasting textures. Sandy topsoil over clayey subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to establish vegetation. The best method to promote bonding is to actually work the topsoil into the layer below for a depth of at least 6 inches.
- Field exploration of the site shall be made to determine if there is surface soil of sufficient quantity and quality to justify stripping. Topsoil shall be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, and clay loam). Avoid areas of natural ground water recharge.
- Stripping shall be confined to the immediate construction area. A 4-inch to 6-inch stripping depth is common, but depth may vary depending on the particular soil. All surface runoff control structures shall be in place prior to stripping.
- Do not place topsoil while in a frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding.
- In any areas requiring grading, remove and stockpile the duff layer and topsoil on site in a designated, controlled area, not adjacent to public resources and critical areas. Reapply stock- piled topsoil to other portions of the site where feasible.
- Locate the topsoil stockpile so that it meets specifications and does not interfere with work on the site. It may be possible to locate more than one pile in proximity to areas where topsoil will be used.
- Stockpiling of topsoil shall occur in the following manner:
    - Side slopes of the stockpile shall not exceed 2H:1V.

    - Between October 1 and April 30:
        - An interceptor dike with gravel outlet and silt fence shall surround all topsoil.
        - Within 2 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
    - Between May 1 and September 30:
        - An interceptor dike with gravel outlet and silt fence shall surround all topsoil if the stockpile will remain in place for a longer period of time than active construction grading.
        - Within 7 days complete erosion control seeding, or covering stockpiles with clear plastic, or other mulching materials.
- When native topsoil is to be stockpiled and reused the following should apply to ensure that the mycorrhizal bacterial, earthworms, and other beneficial organisms will not be destroyed:
    - Re-install topsoil within 4 to 6 weeks.
    - Do not allow the saturation of topsoil with water.
    - Do not use plastic covering.

Maintenance Standards

- Inspect stockpiles regularly, especially after large storm events. Stabilize any areas that have eroded.
- Establish soil quality and depth toward the end of construction and once established, protect from compaction, such as from large machinery use, and from erosion.
- Plant and mulch soil after installation.
- Leave plant debris or its equivalent on the soil surface to replenish organic matter.
- Reduce and adjust, where possible, the use of irrigation, fertilizers, herbicides and pesticides, rather than continuing to implement formerly established practices.

BMP C130: Surface Roughening

Purpose

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface. Horizontal depressions are created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Use this BMP in conjunction with other BMPs such as BMP C120: Temporary and Permanent Seeding, BMP C121: Mulching, or BMP C124: Sodding.

Conditions for Use

- All slopes steeper than 3H:1V and greater than 5 vertical feet require surface roughening to a depth of 2 to 4 inches prior to seeding.
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

Design and Installation Specifications

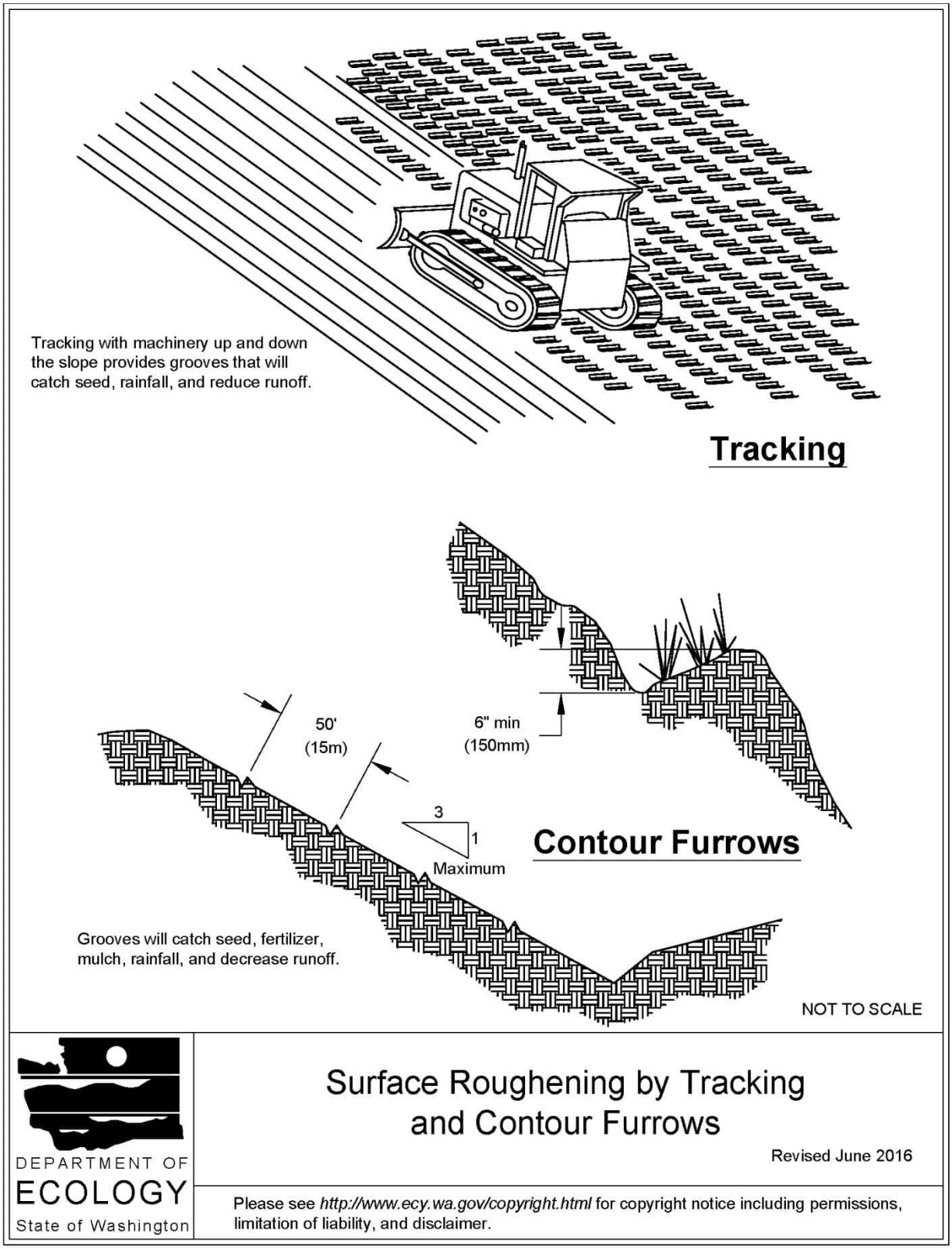
There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, contour furrows, and tracking. See Figure II-3.5: Surface Roughening by Tracking and Contour Furrows. Factors to be considered in choosing a roughening method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

- Disturbed areas that will not require mowing may be stair-step graded, grooved, or left rough after filling.
- Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material that sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment. Stair steps must be on contour or gullies will form on the slope.
- Areas that will be mowed (these areas should have slopes less steep than 3H:1V) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour.
- Graded areas with slopes steeper than 3H:1V but less than 2H:1V should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, leaving a pattern of cleat imprints parallel to slope contours.
- Tracking is done by operating equipment up and down the slope to leave horizontal depressions in the soil.

Maintenance Standards

- Areas that are surface roughened should be seeded as quickly as possible.
- Regular inspections should be made of the area. If rills appear, they should be re-roughened and re-seeded immediately.

Figure II-3.5: Surface Roughening by Tracking and Contour Furrows



BMP C150: Materials on Hand

Purpose

Keep quantities of erosion prevention and sediment control materials on the project site at all times to be used for regular maintenance and emergency situations such as unexpected heavy rains. Having these materials on-site reduces the time needed to replace existing or implement new BMPs when inspections indicate that existing BMPs are not meeting the Construction SWPPP requirements. In addition, contractors can save money by buying some materials in bulk and storing them at their office or yard.

Conditions of Use

- Construction projects of any size or type can benefit from having materials on hand. A small commercial development project could have a roll of plastic and some gravel available for immediate protection of bare soil and temporary berm construction. A large earthwork project, such as highway construction, might have several tons of straw, several rolls of plastic, flexible, pipe, sandbags, geotextile fabric and steel “T” posts.
- Materials should be stockpiled and readily available before any site clearing, grubbing, or earthwork begins. A large contractor or project proponent could keep a stockpile of materials that are available for use on several projects.
- If storage space at the project site is at a premium, the contractor could maintain the materials at their office or yard. The office or yard must be less than an hour from the project site.

Design and Installation Specifications

Depending on project type, size, complexity, and length, materials and quantities will vary. A good minimum list of items that will cover numerous situations includes:

- Clear Plastic, 6 mil
- Drainpipe, 6 or 8 inch diameter
- Sandbags, filled
- Straw Bales for mulching
- Quarry Spalls
- Washed Gravel
- Geotextile Fabric
- Catch Basin Inserts
- Steel "T" Posts
- Silt fence material
- Straw Wattles

Maintenance Standards

- All materials with the exception of the quarry spalls, steel “T” posts, and gravel should be kept covered and out of both sun and rain.
- Re-stock materials as needed.

BMP C232: Gravel Filter Berm

Purpose

A gravel filter berm retains sediment by filtering runoff through a berm of gravel or crushed rock.

Conditions of Use

Use a gravel filter berm where a temporary measure is needed to retain sediment from construction sites.

Do not place gravel filter berms in traffic areas; gravel filter berms are not intended to be driven over.

Place gravel filter berms perpendicular to the flow of runoff, such that the runoff will filter through the berm prior to leaving the site.

Design and Installation Specifications

- Berm material shall be ¾ to 3 inches in size, washed well-grade gravel or crushed rock with less than 5 percent fines. Do not use crushed concrete.
- Spacing of berms:
  - Every 300 feet on slopes less than 5 percent
  - Every 200 feet on slopes between 5 percent and 10 percent
  - Every 100 feet on slopes greater than 10 percent
- Berm dimensions:
  - 1 foot high with 3H:1V side slopes
  - 8 linear feet per 1 cfs runoff based on the 10-year, 24-hour design storm
- See Figure II-3.21: Gravel Filter Berm for a photo of a gravel filter berm application.

Maintenance Standards

Regular inspection is required. Sediment shall be removed and filter material replaced as needed

Figure II-3.21: Gravel Filter Berm



DEPARTMENT OF ECOLOGY
State of Washington

Gravel Filter Berm

Revised July 2017

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BMP C234: Vegetated Strip

Purpose

Vegetated strips reduce the transport of coarse sediment from a construction site by providing a physical barrier to sediment and reducing the runoff velocities of overland flow.

Conditions of Use

- Vegetated strips may be used downslope of all disturbed areas.
- Vegetated strips are not intended to treat concentrated flows, nor are they intended to treat substantial amounts of overland flow. Any concentrated flows must be conveyed through the drainage system to BMP C241: Sediment Pond (Temporary) or other sediment trapping BMP. The only circumstance in which overland flow can be treated solely by a vegetated strip, rather than by a sediment trapping BMP, is when the following criteria are met (see Table II-3.12: Contributing Drainage Area for Vegetated Strips):

Table II-3.12: Contributing Drainage Area for Vegetated Strips

Average Contributing Area Slope	ontributing Area Per- cent Slope	Max Contributing area Flowpath Length
1.5H : 1V or flatter	67% or flatter	100 feet
2H : 1V or flatter	50% or flatter	115 feet
4H : 1V or flatter	25% or flatter	150 feet
6H : 1V or flatter	16.7% or flatter	200 feet
10H : 1V or flatter	10% or flatter	250 feet

Design and Installation Specifications

- The vegetated strip shall consist of a continuous strip of dense vegetation with topsoil for a minimum of a 25-foot length along the flowpath. Grass-covered, landscaped areas are generally not adequate because the volume of sediment overwhelms the grass. Ideally, vegetated strips shall consist of undisturbed native growth with a well-developed soil that allows for infiltration of runoff.
- The slope within the vegetated strip shall not exceed 4H:1V.
- The uphill boundary of the vegetated strip shall be delineated with clearing limits.

Maintenance Standards

- Any areas damaged by erosion or construction activity shall be seeded immediately and protected by mulch.
- If more than 5 feet of the original vegetated strip width has had vegetation removed or is being eroded, sod must be installed.
- If there are indications that concentrated flows are traveling across the vegetated strip, storm-water runoff controls must be installed to reduce the flows entering the vegetated strip, or additional perimeter protection must be installed.

BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

- Sediment traps are intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the tributary area is permanently protected against erosion by vegetation and/or structures.
- Sediment traps are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.
- Projects that are constructing permanent Flow Control BMPs, or Runoff Treatment BMPs that use ponding for treatment, may use the rough-graded or final-graded permanent BMP footprint for the temporary sediment trap. When permanent BMP footprints are used as temporary sediment traps, the surface area requirement of the sediment trap must be met. If the surface area requirement of the sediment trap is larger than the surface area of the permanent BMP, then the sediment trap shall be enlarged beyond the permanent BMP footprint to comply with the surface area requirement.
- A floating pond skimmer may be used for the sediment trap outlet if approved by the Local Per- mitting Authority.
- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Design and Installation Specifications

- See Figure II-3.26: Cross Section of Sediment Trap and Figure II-3.27: Sediment Trap Outlet for details.
- To determine the sediment trap geometry, first calculate the design surface area (SA) of the trap, measured at the invert of the weir. Use the following equation:

$$SA = FS(Q_2/V_S)$$

where

Q_2 =

  - Option 1 - Single Event Hydrograph Method:

Q_2 = Peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 2-year, 24-hour frequency storm for the developed condition. The 10-year peak volumetric flow rate shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection.

- Option 2 - For construction sites that are less than 1 acre, the Rational Method may be used to determine Q_2.

V_S = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm3 has been selected as the particle of interest and has a settling velocity (Vs) of 0.00096 ft/sec.

FS = A safety factor of 2 to account for non-ideal settling.

Therefore, the equation for computing sediment trap surface area becomes: SA = 2 x

$$Q_2/0.00096$$

or

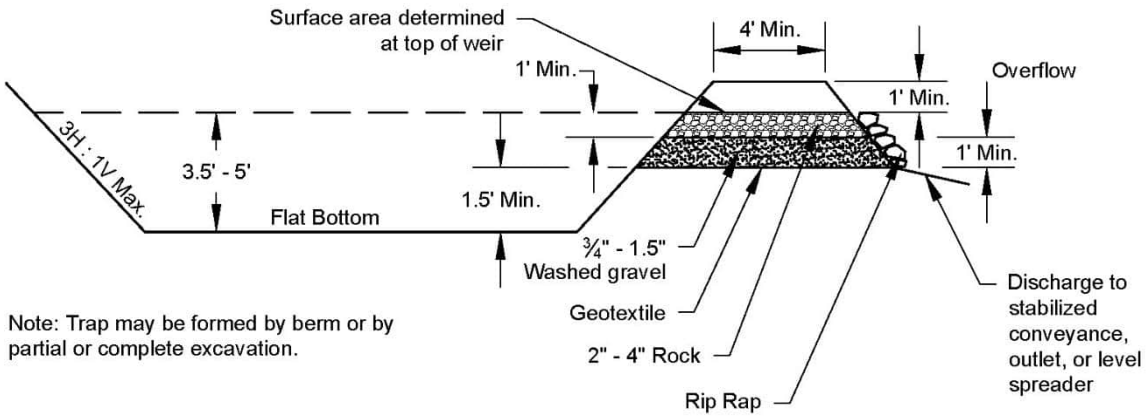
2080 square feet per cfs of inflow

- Sediment trap depth shall be 3.5 feet minimum from the bottom of the trap to the top of the overflow weir.
- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.
- Design the discharge from the sediment trap by using the guidance for discharge from temporary sediment ponds in BMP C241: Sediment Pond (Temporary).

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the trap embankments or slopes shall be repaired.

Figure II-3.26: Cross Section of Sediment Trap



Note: Trap may be formed by berm or by partial or complete excavation.

NOT TO SCALE

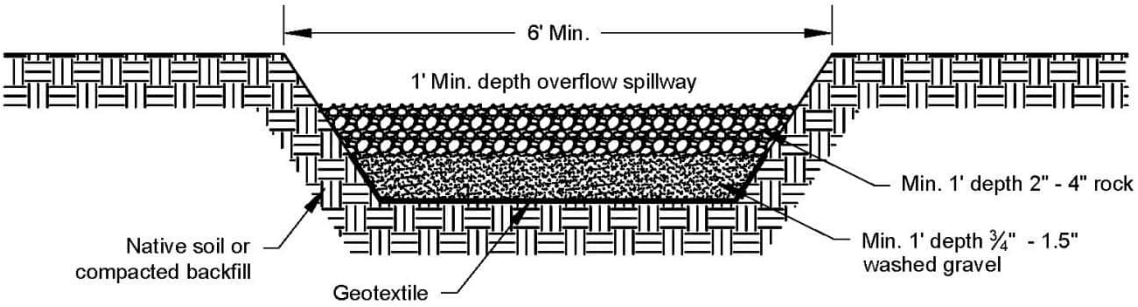
DEPARTMENT OF ECOLOGY
State of Washington

Cross Section of Sediment Trap

Revised June 2016

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Figure II-3.27: Sediment Trap Outlet



NOT TO SCALE

DEPARTMENT OF
ECOLOGY
State of Washington

Sediment Trap Outlet

Revised June 2016

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BMP C251: Construction Stormwater Filtration

Purpose

Filtration removes sediment from runoff originating from disturbed areas of the site.

Conditions of Use

Traditional Construction Stormwater BMPs used to control soil erosion and sediment loss from construction sites may not be adequate to ensure compliance with the water quality standard for turbidity in the receiving water. Filtration may be used in conjunction with gravity settling to remove sediment as small as fine silt (0.5 µm). The reduction in turbidity will be dependent on the particle size distribution of the sediment in the stormwater. In some circumstances, sedimentation and filtration may achieve compliance with the water quality standard for turbidity.

The use of construction stormwater filtration does not require approval from Ecology as long as treatment chemicals are not used. Filtration in conjunction with BMP C250: Construction Stormwater Chemical Treatment requires testing under the Chemical Technology Assessment Protocol – Ecology (CTAPE) before it can be initiated. Approval from Ecology must be obtained at each site where chemical use is proposed prior to use. See https://-fortress.wa.gov/ecy/publications/SummaryPages/ecy070258.html for a copy of the Request for Chemical Treatment form.

Design and Installation Specifications

Two types of filtration systems may be applied to construction stormwater treatment: rapid and slow.

Rapid filtration systems are the typical system used for water and wastewater treatment. They can achieve relatively high hydraulic flow rates, on the order of 2 to 20 gpm/sf, because they have automatic backwash systems to remove accumulated solids.

Slow filtration systems have very low hydraulic rates, on the order of 0.02 gpm/sf, because they do not have backwash systems. Slow filtration systems have generally been used as post construction BMPs to treat stormwater (see V-6 Filtration BMPs). Slow filtration is mechanically simple in comparison to rapid filtration, but requires a much larger filter area.

Filter Types and Efficiencies

Sand media filters are available with automatic backwashing features that can filter to 50 µm particle size. Screen or bag filters can filter down to 5 µm. Fiber wound filters can remove particles down to 0.5 µm. Filters should be sequenced from the largest to the smallest pore opening. Sediment removal efficiency will be related to particle size distribution in the stormwater.

Treatment Process and Description

Stormwater is collected at interception point(s) on the site and diverted to an untreated stormwater sediment pond or tank for removal of large sediment, and storage of the stormwater before it is treated by the filtration system. In a rapid filtration system, the untreated stormwater is pumped from the pond or tank through the filtration media. Slow filtration systems are designed using gravity to convey water from the pond or tank to and through the filtration media.

Sizing

Filtration treatment systems must be designed to control the velocity and peak volumetric flow rate that is discharged from the system and consequently the project site. See Element 3: Control Flow Rates for further details on this requirement.

The untreated stormwater storage pond or tank should be sized to hold 1.5 times the volume of run-off generated from the site during the 10-year, 24-hour storm event, minus the filtration treatment system flowrate for an 8-hour period. For a chitosan-enhanced sand filtration system, the filtration treatment system flowrate should be sized using a hydraulic loading rate between 6-8 gpm/ft^2. Other hydraulic loading rates may be more appropriate for other systems. Bypass should be provided around the filtration treatment system to accommodate extreme storm events. Runoff volume shall be calculated using the methods presented in III-2.3 Single Event Hydrograph Method. Worst-case land cover conditions (i.e., producing the most runoff) should be used for analyses (in most cases, this would be the land cover conditions just prior to final landscaping).

If the filtration treatment system design does not allow you to discharge at the rates as required by Element 3: Control Flow Rates, and if the site has a permanent Flow Control BMP that will serve the planned development, the discharge from the filtration treatment system may be directed to the permanent Flow Control BMP to comply with Element 3: Control Flow Rates. In this case, all discharge (including water passing through the treatment system and stormwater bypassing the treatment system) will be directed into the permanent Flow Control BMP. If site constraints make locating the untreated stormwater storage pond difficult, the permanent Flow Control BMP may be divided to serve as the untreated stormwater storage pond and the post-treatment temporary flow control pond. A berm or barrier must be used in this case so the untreated water does not mix with the treated water. Both untreated stormwater storage requirements, and adequate post-treatment flow control must be achieved. The designer must document in the Construction SWPPP how the permanent. Flow Control BMP is able to attenuate the discharge from the site to meet the requirements of Element 3: Control Flow Rates. If the design of the permanent Flow Control BMP was modified for temporary construction flow control purposes, the construction of the permanent Flow Control BMP must be finalized, as designed for its permanent function, at project completion.

Maintenance Standards

- Rapid sand filters typically have automatic backwash systems that are triggered by a pre-set pressure drop across the filter. If the backwash water volume is not large or substantially more turbid than the untreated stormwater stored in the holding pond or tank, backwash return to the untreated stormwater pond or tank may be appropriate. However, other means of treatment and disposal may be necessary.
- Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged.
- Sediment shall be removed from the storage and/or treatment ponds as necessary. Typically, sediment removal is required once or twice during a wet season and at the decommissioning of the ponds.
- Disposal of filtration equipment must comply with applicable local, state, and federal regulations.

Appendix E

Site Inspection Form

Erosion and Sediment Control Inspection Form

Project Name			**NPDES Permit Number**
CESCL or Qualified Inspector Name		**Inspection Location**	
Date	**Time**	**Type of Inspection**	**Precipitation in last 24 hours**
Current Weather	☐ Clear ☐ Cloudy ☐ Mist ☐ Rain ☐ Wind ☐ Fog		

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
1. **Mark Clearing Limits:** Are high visibility and perimeter fences in good condition? Are natural resource areas protected with barriers or similar BMPs?	☐ OK ☐ Not OK ☐ N/A	
2. **Construction Access Stabilized:** Is track-out of sediment prevented?	☐ OK ☐ Not OK ☐ N/A	
3. **Control Flow Rates:** Are flow rates causing erosion in pond, outlets, etc.?	☐ OK ☐ Not OK ☐ N/A	
4. **Install Sediment Controls:** Are sediment controls in place & functioning properly?	☐ OK ☐ Not OK ☐ N/A	

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
5. **Stabilize Soils:** Has bare soil been protected and is erosion prevented? Are stockpiles stabilized from erosion?	☐ OK ☐ Not OK ☐ N/A	
6. **Protect Slopes:** Have slopes been protected and is erosion prevented?	☐ OK ☐ Not OK ☐ N/A	
7. **Protect Drain Inlets:** Existing storm drains inlets are protected?	☐ OK ☐ Not OK ☐ N/A	
8. **Stabilize Channels & Outlets:** Are conveyances (channels & outlets) stabilized?	☐ OK ☐ Not OK ☐ N/A	
9**. Control Pollutants:** Are all pollutants handled & disposed of in a way that does not contaminate stormwater? Has secondary containment been provided?	☐ OK ☐ Not OK ☐ N/A	

Element # & Inspection	Status	BMP Location & Condition, Corrective Action, General Notes
10.**Control Dewatering/Water Management:** Is dewatering being done in compliance with the SWPPP? Were there any clean non-turbid dewatering discharges?	☐ OK ☐ Not OK ☐ N/A	
11.**Maintain BMPs:** Are all BMPs maintained to assure continued performance of their intended function?	☐ OK ☐ Not OK ☐ N/A	
12.**Manage the Project:** Has the SWPPP been updated, implemented and records maintained?	☐ OK ☐ Not OK ☐ N/A	
13.**Protect LID BMPs:** Are LID BMPs protected from sedimentation?	☐ OK ☐ Not OK ☐ N/A	
Describe water discharging from site, if present. Note any suspended sediment, “cloudiness,” discoloration, or oil sheen.		
This site is in compliance with the TESC and SPCC plans and the NPDES permit.	☐ OK ☐ Not OK ☐ N/A	

Corrective Action List				
Element #	**Description and Location**	**Action Required**	**Completion Date**	**Initials**

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

Inspected by: (Print) _____ (Signature) _____ Date: _____

Title/Qualification of Inspector: _____

May 31, 2024

Project No. US-EI-PS21204410.01

Mr. David Horne
Site Manager and Bay-Wide Coordinator
Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, Washington 98504

Sent via e-mail: hoda461@ecy.wa.gov

Subject: Substantial Compliance with Stormwater Standards
Whitmarsh Landfill Cleanup Action Plan
Skagit County, Washington

Dear Mr. Horne:

The Whitmarsh Landfill, located on Padilla Bay in Anacortes, Washington is listed on the Washington State Department of Ecology (Ecology) Hazardous Sites List as Facility ID 2662, and is currently in the design phase. The project is exempt from local permitting, but it does require to have local jurisdiction to review and confirm the project is in substantial compliance with their standards.

In a recent conversation with the City of Anacortes (City), they have requested that a Stormwater Site Plan for the project be prepared in accordance with the 2019 Stormwater Management Manual for Western Washington (SWMMWW); a copy of the requirements and guidance is attached for your reference. WSP Earth and Environment, Inc. (WSP) has prepared this letter on behalf of Skagit County, to provide a summary of the project that we believe meets the intent of the request from the City even though the requirements set forth in the City's Stormwater Site Plan form and guidance do not directly relate for a landfill regrading and capping project. We request Ecology discuss the matter with the City to avoid further delay and allow application for a construction stormwater discharge permit to proceed.

COMPLIANCE WITH MINIMUM STANDARDS

The SWMMWW provides 9 minimum requirements for stormwater management for new developments. The Whitmarsh Landfill is classified as a new development project with respect to the SWMMWW as the site does not contain 35% or more of existing hard surface coverage. The project has land disturbing activities of 7,000 square feet or greater and converts greater than ¾ acres or more of vegetation to landscaped areas, triggering minimum requirements #1 through #9 for the project site. This document seeks to address the compliance of the Whitmarsh Landfill in accordance with the 9 minimum requirements presented in the SWMMWW.

MINIMUM REQUIREMENT NO. 1: PREPARATION OF STORMWATER SITE PLAN

This letter is intended to substantially fulfill Minimum Requirement 1: Preparation of Stormwater Site Plans and is prepared in accordance with Volume III of the 2019 SWMMWW.

MINIMUM REQUIREMENT NO. 2: CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

A Construction Stormwater Pollution Prevention Plan (SWPPP) was prepared in accordance with Volume II of the 2019 SWMMWW for the Whitmarsh Landfill. The best management practices (BMPs) during construction are identified in the SWPPP. Primarily, the stormwater over the existing exposed landfill waste infiltrates. The

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4600 East Washington Street, Suite 600
Phoenix, Arizona 85034

T: +1 602-733-6000
wsp.com

earthwork along the shoreline is planned to be conducted in segments that can be covered in the same shift, thus minimizing exposure. The groundwater will be intercepted upgradient from trenches or pits, where the groundwater will be pumped to a central treatment system on site for processing and subsequent discharge into the local sanitary sewer system. Other steps such as sloping the work platform away from the shoreline, installing containment berms, or collecting any stormwater at the toe of the excavation, will be implemented to capture stormwater. The SWPPP has been updated and upon approval will be submitted to the City and Ecology's Water Quality Division.

MINIMUM REQUIREMENT NO. 3: SOURCE CONTROL OF POLLUTION

The intent of Source Control BMP's is to prevent stormwater from coming into contact with pollutants after project completion. The regraded waste will be covered with existing on-site sandy soil, then capped with geosynthetic low permeability layer and capped with three feet of imported earthen material. No pollution generating surfaces will be present after the final grading. The final surface will be vegetated on the slopes and grass or crushed rock surfacing. Source control BMP's that will be implemented for the construction phase of the project are described in the SWPPP. These BMP's will remain until all soils are stabilized.

MINIMUM REQUIREMENT NO. 4: PRESERVATION OF NATURAL DRAINAGE SYSTEMS AND OUTFALLS

The existing site conditions contain two primary drainage conveyance systems in the form of swales bounding the northern and southern areas of the site. These existing swales discharge stormwater runoff directly to Padilla Bay and are tidally influenced with the high tide line (HTL) extending up to and beyond the downstream extents of either swale. These drainage systems will be maintained and widened on the north by over 20 feet and approximately two feet along the western portion of the southern swale to ensure the preservation of pre-existing drainage systems. The modifications of the northern drainage swale will result in the swale being tidally influenced throughout its extents. Modifications to the southern drainage swale are minor and include regrading and stabilizing the bank abutting the landfill with drain rock and crushed surfacing top course (see Detail 2 on sheet C-14 of the Remedial Action plan set).

MINIMUM REQUIREMENT NO. 5: ONSITE STORMWATER MANAGEMENT

Projects qualifying as flow control exempt shall either use Low Impact Development (LID) BMPs from SWMMWW List #3 for all surfaces or use the Flow Control BMPs desired to achieve LID Performance Standard and apply BMP T5.13: Post Construction Soil Quality and Depth. Since the project is flow control exempt (see Minimum Requirement No. 7) and employs guidance from BMP T5.13, the objective of on-site stormwater management is achieved.

Establishing soil quality and depth regains greater stormwater functions in the post development landscape, provides increased treatment of pollutants and sediments that result from development and habitation, and minimizes the need for some landscaping chemicals, thus reducing pollution from prevention. BMP T5.13 requires a minimum 8-inch topsoil layer with a minimum organic matter content of 10% dry weight in planting beds.

The project proposes to place four layers of imported earthen material totaling 3 feet thick above the geosynthetic cap. The top 6 inches will be select topsoil from a virgin source and characterized; it's use will be subject to approval by Ecology. Below the topsoil will be three additional layers of material. Directly beneath the topsoil is 12-inch-thick layer of common earth/borrow which will be track-compacted. Then below that will be a 12-inch layer of select borrow over a 6-inch layer of sand. The slopes along the north, east, and southeast of the final grade will be landscaped with select plants; see sheets R-1 through R-8 for the final planting and restorations. At the plant locations the completed backfill will be hand-excavated to the depth of 12 inches and backfilled with soil and compost along with the plants. Topsoil will be stabilized through seeding and riparian planting, distinguished by area type (i.e. Upper Cap & Roadside Seed Mix, Lower Slope Shoreline Seed Mix, and Riparian Shrub Areas), further increasing the organic content in the topsoil layer. The proposed engineered low permeability cap substantially meets the intent set forth from BMP T5.13.

MINIMUM REQUIREMENT NO. 6: RUNOFF TREATMENT

For the proposed final grading plan, no pollution-generating hard surfaces (PGHS) will be constructed. The proposed one-way access road surrounding the site vicinity is considered a hard surface in accordance with the SWMMWW. However, the access road falls under the category of an infrequently used maintenance access road

and is not considered to have "vehicular use" by the definition in the SWMMWW and therefore not PGHS. The completed site will be enclosed with coated chain link fence allowing site access solely to authorized personnel for long term maintenance and monitoring. There will be no PGHS on the developed site triggering Minimum Requirement No. 6.

No pollution-generating pervious surfaces (PGPS) are proposed in the final site plan. The upper cap will be planted with seed mix, the lower sloped shoreline will include both riparian shrubs and seed mix, and below the high tide line (HTL) will be bare sand. The site planting plan incorporates the use of organic, phosphate free fertilizer for initial planting. During the 5-year monitoring period, herbicides will be allowed as a last measure after first removing of invasives species. However, fertilizers and herbicides are not planned for long-term maintenance of the site. Therefore, the pervious surfaces are not considered pollution generating.

MINIMUM REQUIREMENT NO. 7: FLOW CONTROL

Flow control is not required for threshold discharge areas (TDAs) that discharge directly or indirectly through manmade conveyance elements that have sufficient capacity and adequately stabilized to prevent erosion to exempt receiving waters. Table I-A.1 in Appendix A of the SWMMWW lists Flow Control Exempt Receiving Waters. All salt waterbodies are classified as flow control exempt receiving waters.

The site is considered to be a single TDA because the entire site drains to a single natural discharge location (tidally exempt waters of Padilla Bay) that combines (via the two drainage swales) within one-quarter mile downstream of the site. The modifications of the northern drainage swale will result in the swale being tidally influenced throughout its extent. Runoff from the site draining north, even though it drains into the northern drainage swale, will drain directly into the exempt water body. The southern swale is mapped as a Category II wetland (described below in Minimum Requirement No. 8), however, modifications to the southern drainage swale include regrading and stabilizing the bank abutting the landfill with drain rock and crushed rock. These modifications will maintain sufficient capacity and stabilization through the swale to the tidal waters of Padilla Bay. The stormwater runoff from the site will be conveyed to the high tide line (HTL) of Padilla Bay, an exempt receiving water body, exempting the Whitmarsh Landfill to employ flow control BMPs.

MINIMUM REQUIREMENT NO. 8: WETLANDS PROTECTION

To protect the hydroperiods of wetlands that will receive stormwater flows post-construction of the site, certain criteria need to be met depending on the wetland category and hydrogeomorphic class as defined in Ecology's Wetland Rating System for Western Washington (Hruby and Yahnke 2023) and whether the applicant owns or has legal access to the site. Hamer LLC conducted a delineation of the site and their findings resulted in the delineation of two wetlands, a Category I saltwater marsh and a Category II palustrine marsh. Information contained within the rating forms concluded that the Category II palustrine marsh is an impounding depressional wetland.

The trigger for the need to review the hydroperiod protection measures is whether the project will trigger Minimum Requirement No. 7 (Flow Control). As stated above, the project will be exempt from flow control requirements as all saltwater bodies are on the list of exempt receiving waters. However, all flows that discharge to the southern swale pass along the Category II palustrine marsh prior to entering the exempt water body. This discharge from the site could be considered subject to the hydroperiod protection measures. As a Category II impounding depressional wetland to which the applicant has legal access to, Method I monitoring criteria is typically considered.

Method I monitoring involves installing monitoring wells and monitoring the water holding capacity of the wetland for one water year of field monitoring. However, due to the wetland being controlled mainly by the diurnal tides that create backwater into this wetland, it is not anticipated that the proposed stormwater will result in a discernable change to the wetlands hydroperiod and water holding capacity. Essentially, any monitoring efforts following Method I will result in a water surface elevation that correlates to the tidal cycle rather than a "natural" surface elevation in a non-tidally controlled impounding depressional wetland. Areas, that pond water will maintain their existing heights and during low tides the water level is anticipated to be equal to the existing conditions. Due to this tidal control on the wetland ponding depths, it is reasonable to conclude that Method I monitoring of this wetland will not be required and no further action is necessary to meet Minimum Requirement No. 8.

MINIMUM REQUIREMENT NO. 9: OPERATION AND MAINTENANCE

The objective of this minimum requirement is to ensure that Stormwater Management BMPs are properly maintained and operated. All temporary and permanent erosion and sediment control BMP's will be maintained and repaired as needed to ensure continued performance of their intended function. The maintenance plan and inspection forms can be reviewed in the SWPPP (WSP, 2024). A long-term maintenance plan is described in the Final Wetland Buffer Mitigation Plan (WSP, 2024) which describes maintenance requirements, monitoring methods, the frequency of inspections and success criteria.

Please call me if you have questions about this letter.

Sincerely,
WSP USA Environment & Infrastructure Inc.

Chester Croson, EIT
Associate Consultant, Water Resources Engineering

Scott Stoneman
Vice President, Civil Engineering

Attachments: City of Anacortes Stormwater Site Plan Guidance
90% Design Drawings

c: Susannah Edwards, Ecology
Amy Hargrove, Ecology
Margo Gillaspy, Skagit County
Koorus Tahghighi, WSP
Project File

ATTACHMENT

CITY OF ANACORTES STORMWATER SITE PLAN GUIDANCE

ATTACHMENT

90% DESIGN DRAWINGS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

March 31, 2025

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Re: Administrative Order

Administrative Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill 9663 March's Point Rd Anacortes, WA 98221

Dear Margo Gillaspy:

The Department of Ecology (Ecology) is issuing the enclosed Administrative Order (Order) requiring Skagit County Public Works to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

If you have questions, please contact Sylvia Graham at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Sincerely,

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

Enclosure: Administrative Order Docket #23530

By Certified Mail# 9171 9690 0935 0233 1456 50

cc: Koorus Tahghighi, WSP USA Environment & Infrastructure Inc., koorus.tahghighi@wsp.com
David Horne, Ecology Toxics Cleanup Program, hoda461@ecy.wa.gov
PARIS Permit No. WAR313996

State of Washington
Department of Ecology

In the Matter of an Administrative Order Against Skagit County Public Works Margo Gillaspy Administrative Order Docket #23530

To: Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Administrative Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill 9663 March's Point Rd Anacortes, WA 98221

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- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

This is an Administrative Order in accordance with General Condition G12 (Additional Monitoring) as set forth in the Construction Stormwater General Permit. Chapter 90.48.120(2) RCW authorizes Ecology to issue Administrative Orders to accomplish the purposes of Chapter 90.48 RCW.

1. Order to Comply

Skagit County Public Works is subject to coverage under NPDES Construction Stormwater General Permit (CSGP) WAR313996 for construction activities associated with the construction site known as March Point (Whitmarsh) Landfill (9663 March's Point Rd, Anacortes, WA 98221). The project consists of 16.8 acres of disturbed acres. The proposed project comprises of cleanup of a historic landfill, Cleanup Site ID 304. The cleanup actions include excavating the perimeter of the site and redistributing existing solid waste and landfill cap to regrade the site and install an impermeable cap.

The receiving waterbody following treatment is Padilla Bay. Ecology was notified of the presence of onsite groundwater and/or soil contamination, which has the potential to discharge in stormwater and dewatering water due to the proposed construction activity. The Construction Stormwater General Permit does not have water quality sampling or

benchmarks for the known contaminants of concern, listed in Table 1, below; however, the permit requires compliance with the Water Quality Standards for Surface Waters of the State of Washington (Water Quality Standards – 173-201A WAC) and prohibits any discharges of pollutants.

The Order establishes Indicator Levels for the March Point (Whitmarsh) Landfill project. Indicator Levels express a pollutant concentration used as a threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. Indicator Levels in this Administrative Order were derived from WAC 173-201A and the analytical method's minimum quantitation level.

For these reasons and in accordance with RCW 90.48.120(2) it is ordered that Skagit County Public Works take the following actions. These actions are required at the location known as March Point (Whitmarsh) Landfill, located at 9663 March's Point Rd, Anacortes, WA 98221. In the event of a permit transfer to another Permittee, compliance with this Administrative Order and the actions listed below is required.

Skagit County Public Works must take the following actions to remain in compliance with NPDES Permit WAR313996:

- Install all pre-treatment and treatment systems prior to any discharge of contaminated dewatering water or contaminated construction stormwater to the receiving waterbody.
- Capture, contain, and treat all contaminated dewatering water or contaminated construction stormwater prior to discharge to the receiving waterbody.
- Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated construction stormwater. Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance.
- All captured sediment from the treatment of the contaminated dewatering water or contaminated construction stormwater must be transported to an approved disposal facility based on the level of contamination.

The treatment system must have enough capacity to hold treated contaminated dewatering water or contaminated construction stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been met. No contaminated dewatering water or contaminated construction stormwater may be discharged before it has been tested for the parameters listed in Table 1. If any of the Indicator Levels listed in Table 1 are exceeded, the treated contaminated dewatering water or contaminated construction stormwater must not be discharged to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Skagit County Public Works must modify the existing treatment to increase effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or groundwater off-site for disposal in an approved manner. Skagit County Public Works may also discharge to sanitary sewer with the approval of the proper sewer authority.

Once the effectiveness of the treatment system has been determined, Skagit County Public Works may revert to a flow-through treatment system after a minimum of two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design and batch sampling results must be submitted to Ecology for review prior to use.

- If a flow-through treatment system is adopted, all contaminated dewatering water or contaminated construction stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1.
- When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Skagit County Public Works must stop the discharge of treated contaminated dewatering water or contaminated construction stormwater to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Skagit County Public Works must modify the existing flow-through treatment system to increase its effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or contaminated dewatering water off-site for disposal in an approved manner. Skagit County Public Works may also discharge the treated water to sanitary sewer in accordance with the conditions of the discharge authorization from the proper sewer authority.
- Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports).
- If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the DMR.
- Any discharge to Waters of the State in exceedance of the contaminant Indicator Levels in Table 1 must be reported to the Department of Ecology according to Permit Condition S5.F, Noncompliance Notification as follows:
    - Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (206) 594-0000 (note that this is a new phone number as of 5/17/2021).
    - Cease the discharge until Indicator Levels can be met.
    - Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for the full written report requirements.
    - For exceedances of the numeric benchmark for pH, refer to Special Condition S4.D.4 of the CSGP.

- All monitoring data must be prepared by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC.
- All sampling data must be reported monthly on DMRs electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured concentration is below the detection level then Skagit County Public Works must report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value.
- Contaminated soils excavated during construction will be immediately hauled offsite without stock piling to an approved disposal facility based on the level of contamination. When it is not feasible to immediately haul soils offsite, the soils must be placed in a covered area to minimize contact with stormwater.
- Noncompliance with permit requirements or the provisions of this Order (such as exceedances of indicator levels) must be immediately reported to the Northwest Region Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification.
- The Stormwater Pollution Prevention Plan (SWPPP) prepared for March Point (Whitmarsh) Landfill must be fully implemented and amended as needed for the duration of the project.
- If a modification of the Order is desired, a written request must be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.

Ecology retains the right to make modifications to this Order through supplemental Order, or amendment to this Order, it if appears necessary to further protect the public interest.

This Order does not exempt Skagit County Public Works from any Construction Stormwater General Permit requirement. This Order automatically terminates when NPDES Construction Stormwater General Permit WAR313996 is terminated.

Table 1. Marine/Brackish Water Parameters

Skagit County Public Works must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Skagit County Public Works uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
PETROLEUM HYDROCARBONS						
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/Weekly	Grab	2.0 [a]	SW 846 8021/ 8260	1.0	2.0
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/Weekly	Grab	250 [a]	NWTPH-Gx	250	250
METALS						
Aluminum, Total (7429-90-5)	Batch/Weekly	Grab	240 [d]	200.8	2	10
Arsenic, Total (7440-38-2)	Batch/Weekly	Grab	69 [e]	200.8	0.1	0.5
Barium, Total (7440-39-3)	Batch/Weekly	Grab	1,000 [f]	200.8	0.5	2.0
Beryllium, Total (7440-41-7)	Batch/Weekly	Grab	0.5 [a]	200.8	0.1	0.5
Cadmium, Total (7440-43-9)	Batch/Weekly	Grab	42.25 [e]	200.8	0.05	0.25
Chromium, Total (7440-47-3)	Batch/Weekly	Grab	1100 [g]	200.8	0.2	1.0
Copper, Total (7440-50-8)	Batch/Weekly	Grab	5.78 [e]	200.8	0.4	2.0
Iron, Total (7439-89-6)	Batch/Weekly	Grab	300 [h]	200.7	12.5	50
Lead, Total (7439-92-1)	Batch/Weekly	Grab	220.82 [e]	200.8	0.1	0.5

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Manganese, total (7439-96-5)	Batch/Weekly	Grab	100 [i]	200.8	0.1	0.5
Mercury, Total (7439-97-6)	Batch/Weekly	Grab	2118 ng/L [e]	1631E	0.2 ng/L	0.5 ng/L
Molybdenum, total (7439-98-7)	Batch/Weekly	Grab	0.5 [a]	200.8	0.1	0.5
Nickel, Total (7440-02-0)	Batch/Weekly	Grab	74.75 [e]	200.8	0.1	0.5
Selenium, Total (7782-49-2)	Batch/Weekly	Grab	290.58 [e]	200.8	1.0	1.0
Silver, Total (7440-22-4)	Batch/Weekly	Grab	2.24 [e]	200.8	0.04	0.2
Strontium (7440-24-6)	Batch/Weekly	Grab	3.85 [a]	200.7	0.77	3.85
Thallium, Total (7440-28-0)	Batch/Weekly	Grab	0.36 [a]	200.8	0.09	0.36
Titanium (7440-32-6)	Batch/Weekly	Grab	2.5 [a]	200.8	0.5	2.5
Vanadium (7440-62-2)	Batch/Weekly	Grab	12.5 [a]	200.8	2.5	12.5
Zinc, Total (7440-66-6)	Batch/Weekly	Grab	95.14 [e]	200.8	0.5	2.5
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) AND CARCINOGENIC PAHs						
Acenaphthene (83-32-9)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Acenaphthylene (208-96-8)	Batch/Weekly	Grab	10.5 [a]	625.1	3.5	10.5
Benzo(a)anthracene (56-55-3)	Batch/Weekly	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(a)pyrene (50-32-8)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(b)fluoranthene (205-99-2)	Batch/Weekly	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(g,h,i)perylene (191-24-2)	Batch/Weekly	Grab	12.3 [a]	610/625.1	4.1	12.3
Benzo(j)fluoranthene (205-82-3)	Batch/Weekly	Grab	1.0 [a]	625	0.5	1.0
Benzo(k)fluoranthene (207-08-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Fluoranthene (206-44-0)	Batch/Weekly	Grab	6.6 [a]	625.1	2.2	6.6
Fluorene (86-73-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Indeno(1,2,3-cd)pyrene (193-39-5)	Batch/Weekly	Grab	11.1 [a]	610/625.1	3.7	11.1
1-Methylnaphthalene (90-12-0)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
2-Methylnaphthalene (91-57-6)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
Naphthalene (91-20-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/Weekly	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
VOLATILE ORGANIC COMPOUNDS (VOC), SEMI-VOCs AND HALOGENATED VOCs						
Acetone (67-64-1)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
Benzoic Acid (65-85-0)	Batch/Weekly	Grab	50 [a]	8270	10	50
2-Butanone (MEK) (78-93-3)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
n-Butylbenzene (104-51-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
sec-Butylbenzene (135-98-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Butylbenzylphthalate (85-68-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Carbazole (86-74-8)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Carbon Disulfide (75-15-0)	Batch/Weekly	Grab	10.0 [a]	624.1/8260	10	10
Chlorobenzene (108-90-7)	Batch/Weekly	Grab	18.0 [a]	624.1	6.0	18.0
Chloroethane (75-00-3)	Batch/Weekly	Grab	2 [a]	624.1/601	1	2
Chloroform (67-66-3)	Batch/Weekly	Grab	4.8 [a]	624.1 or SM6210B	1.6	4.8
Dibenzofuran (132-64-9)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Diethylphthalate (84-66-2)	Batch/Weekly	Grab	1.9 [a]	625.1	1.9	5.7
1,2-Dichlorobenzene (95-50-1)	Batch/Weekly	Grab	7.6 [a]	624.1	1.9	7.6
1,4-Dichlorobenzene (106-46-7)	Batch/Weekly	Grab	17.6 [a]	624.1	4.4	17.6
Cis-1,2-Dichloroethene (156-59-2)	Batch/Weekly	Grab	4.8 [a]	624.1	1.6	4.8

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
2,4-Dimethylphenol (105-67-9)	Batch/Weekly	Grab	8.1[a]	625.1	2.7	8.1
bis(2-ethylhexyl)phthalate (117-81-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Isopropylbenzene (98-82-8)	Batch/Weekly	Grab	1.0 [a]	624/8260	1.0	1.0
2-Methylphenol (o-Cresol) (95-48-7)	Batch/Weekly	Grab	10 [a]	625.1	3.5	10
(3+4) Methyphenol (m,p-cresol) (65794-96-9)	Batch/Weekly	Grab	20 [a]	625.1/8270E	7	20
4-methylphenol (p-cresol) (106-44-5)	Batch/Weekly	Grab	10.0 [a]	8270	10	10
4-Methyl-2-pentanone (MIBK) (108-10-1)	Batch/Weekly	Grab	5.0 [a]	624.1	1.9	5.0
N-Nitrosodiphenylamine (86-30-6)	Batch/Weekly	Grab	2.0 [a]	625.1	1.0	2.0
Pentachlorophenol (87-86-5)	Batch/Weekly	Grab	13 [e]	625.1	3.6	10.8
Phenol (108-95-2)	Batch/Weekly	Grab	4.5 [a]	625.1	1.5	4.5
n-propylbenzene (103-65-1)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Tetrachloroethylene (127-18-4)	Batch/Weekly	Grab	12.3 [a]	624.1	4.1	12.3
2,3,4,6-Tetrachlorophenol (58-90-2)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.38	2.5
2,4,5-Trichlorophenol (95-95-4)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.57	2.5
1,2,4 –Trimethylbenzene (95-63-6)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
1,3,5 –Trimethylbenzene (108-67-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
POLYCHLORINATED BIPHENYLS (PCBs)						
PCBs, Total [j]	Batch/Weekly	Grab	10.0 [e]	608.3	0.065	0.195
PESTICIDES						
Alpha-BHC (319-84-6)	Batch/Weekly	Grab	0.009 [a]	608.3	0.003	0.009
4,4'-DDD (72-54-8)	Batch/Weekly	Grab	1.10 [l]	608.3	0.011	0.033
4,4'-DDE (72-55-9)	Batch/Weekly	Grab	1.10 [l]	608.3	0.004	0.012
4,4'-DDT (50-29-3)	Batch/Weekly	Grab	130 ng/L [e]	608.3	12 ng/L	36 ng/L
Aldrin (309-00-2)	Batch/Weekly	Grab	12 ng/L [a, k]	608.3	4.0 ng/L	12 ng/L
Carbaryl (63-25-2)	Batch/Weekly	Grab	1.6 [m]	EPA 531.1	1.5	6.5
Delta-BHC (319-86-8)	Batch/Weekly	Grab	27 ng/L [a]	608.3	9.0 ng/L	27 ng/L
Dieldrin (60-57-1)	Batch/Weekly	Grab	0.71 [e]	608.3	0.002	0.006
Endosulfan II (33213-65-9)	Batch/Weekly	Grab	0.034 [m]	608.3	4.0 ng/L	12 ng/L
Gamma-Chlordane (5103-74-2)	Batch/Weekly	Grab	42 ng/L [a]	608.3	14 ng/L	42 ng/L
Endosulfan sulfate (1031-07-8)	Batch/Weekly	Grab	198 ng/L [a]	608.3	66 ng/L	198 ng/L
Endrin Aldehyde (7421-93-4)	Batch/Weekly	Grab	70 ng/L [a]	608.3	23 ng/L	70 ng/L
Methoxychlor (72-43-5)	Batch/Weekly	Grab	0.03 [n]	608.3	0.007	0.02
DIOXIN/FURAN CONGENERS						
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin (HxCDD) (57653-85-7)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.43 pg/L	50 pg/L
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin (HxCDD) (19408-74-3)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.29 pg/L	50 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin (HpCDD) (35822-46-9)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	0.982 pg/L	50 pg/L

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (3268-87-9)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	3.14 pg/L	100 pg/L
2,3,7,8-Tetrachlorodibenzofuran (TCDF) (51207-31-9)	Batch/Weekly	Grab	5.0 pg/L [a]	1613/8290A	1.3 pg/L	5.0 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (67562-39-4)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.28 pg/L	50 pg/L
Octachlorodibenzofuran (OCDF) (39001-02-0)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	2.59 pg/L	100 pg/L

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency***	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly	Grab	25 NTU	SM2130 °
pH	Batch/Weekly	Grab	6.5 - 8.5 SU	SM4500-H^+ B

NOTES	
a	No applicable surface water criterion, value is laboratory quantitation level.
b	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile ("diesel") for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
c	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.
d	Acute Freshwater Criteria from "Final Aquatic Life Ambient Water Quality Criteria for Aluminum, Table K-1"; United States Environmental Protection Agency; December 2018. Based on pH 7.0 and Total Hardness of 50 mg/L.
e	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
f	Applicable surface water criterion does not exist for barium. The indicator level of 1,000 µg/L for barium is based on groundwater quality standards to be protective of human health and the environment.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
g	Indicator Level total chromium is actually for hexavalent chromium using Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) because there is no water quality standard for total chromium.					
h	Organoleptic Effect Criteria, National Recommended Water Quality Criteria, United States Environmental Protection Agency.					
i	The human health criteria for consumption of water+ organism from National Recommended Water Quality Criteria - Human Health Criteria Table (1993)/ Criteria for domestic water supply from the Quality Criteria for Water, 1986 ("Gold Book").					
j	Total PCBs are the sum of all congener or all isomer or homolog or Aroclor analyses. Value is the Lowest Level of Quantitation (LLOQ) for water samples for PCBs by EPA Method 8082A, Update V.					
l	Acute – Freshwater Toxic Substances Criteria (WAC 173-201A-240).					
k	Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.					
m	Acute Aquatic Life Criteria-Saltwater from EPA National Recommended WQ Criteria (2012).					
n	Chronic Aquatic Life Criteria -Saltwater from Toxic Substances Criteria (WAC 173-201A-240) 2016.					
o	Or equivalent.					
*	If permission granted for flow-through, sampling will then be weekly.					

2. Failure to Comply With This Order

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

3. Your Right to Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt. The appeal process is governed by RCW 43.21B and WAC 371-08. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within 30 days of the date of receipt of this Order:

- File your notice of appeal and a copy of this Order with the PCHB (see filing information below). "Filing" means actual receipt by the PCHB during regular business hours as defined in WAC 371-08-305 and -335. "Notice of appeal" is defined in WAC 371-08-340.
- Serve a copy of your notice of appeal and this Order on the Department of Ecology mail, in person, or by email (see addresses below).

You must also comply with other applicable requirements in RCW 43.21B and WAC 371-08.

Filing with the PCHB

For the most current information regarding filing with the PCHB, visit: https://eluho.wa.gov/ or call: 360-664-9160.

Service on Ecology

Street Address:
Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:
ecologyappeals@ecy.wa.gov

4. Contact Information

Please direct all questions about this Administrative Order to:

Sylvia Graham
Department of Ecology
Northwest Region Office
P.O. Box 330316
Shoreline, WA 98133-9716

Phone: (360) 927-4900
Email: sylvia.graham@ecy.wa.gov

5. More Information

- **Pollution Control Hearings Board Website:**
  https://www.eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental and Land Use Hearings Office – Pollution Control Hearings Board:**
  https://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure**
  https://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  https://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules, & Rulemaking Website**
  https://ecology.wa.gov/Footer/rulemaking

6. Signature

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

March 31, 2025

Date

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Region Office
PO Box 330316, Shoreline, WA 98133-9716 • 206-594-0000

April 30, 2025

Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Re: Amended Administrative Order

Amended Order Docket #	23633
Original Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill
	9663 March's Point Rd
	Anacortes, WA 98221

Dear Margo Gillaspy:

The Department of Ecology (Ecology) is issuing the enclosed Administrative Order (Order) requiring Skagit County Public Works to comply with:

- Chapter 90.48 Revised Code of Washington (RCW) - State of Washington Water Pollution Control Act.
- Chapter 173-201A Washington Administrative Code (WAC) - Water Quality Standards for Surface Waters of the State of Washington.
- Construction Stormwater General Permit WAR313996: National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit for Stormwater Discharges Associated with Construction Activity.

If you have questions, please contact Sylvia Graham at sylvia.graham@ecy.wa.gov or (360) 927-4900.

Sincerely,

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

Enclosure: Amended Order Docket #23633

By Certified Mail #9171 9690 0935 0233 1454 45

ecc: Koorus Tahghighi, WSP USA Environment & Infrastructure Inc., koorus.tahghighi@wsp.com
David Horne, Ecology Toxics Cleanup Program, hoda461@ecy.wa.gov
PARIS Permit No. WAR313996

State of Washington
Department of Ecology

In the Matter of an Amended Administrative Order Against Skagit County Public Works Margo Gillaspy Amended Administrative Order #23633 Administrative Order Docket #23530

To: Margo Gillaspy
Skagit County Public Works
1800 Continental Pl
Mount Vernon, WA 98273-5625

Amended Order Docket #	23633
Original Order Docket #	23530
Site Location	March Point (Whitmarsh) Landfill
	9663 March's Point Rd
	Anacortes, WA 98221

The Department of Ecology (Ecology) has issued this Amended Administrative Order (Order) Docket #23633 to amend Order Docket #23530, dated March 31, 2025, issued to Skagit County Public Works:

This Order describes the corrective actions required at the location known as March Point (Whitmarsh) Landfill, located at 9663 March's Point Rd, Anacortes, WA 98221.

1. Order to Comply

Background and associated corrective actions are described in full in the original Administrative Order #23530.

Skagit County Public Works submitted additional information to Ecology regarding the inability to meet certain laboratory analysis required in Table 1 of Order #23530. After reviewing the laboratory analysis provided by their lab, Ecology has revised Table 1 to reflect available options. Table 1 below includes new Indicator Levels, Detection Limits, and Quantitation Levels for certain analytes, and removal of three analytes: carbaryl, 4-methylphenol, and benzo(j)fluoranthene. All other corrective actions and monitoring requirements from Order #23530 are unchanged and remain in effect.

Table 1 from Administrative Order #23530, effective March 31, 2025, is fully replaced by the Table 1 below. No other condition or requirement of Order #23530, including the monitoring requirements, is hereby affected by this amendment.

Table 1. Marine/Brackish Water Parameters

Skagit County Public Works must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Skagit County Public Works uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
PETROLEUM HYDROCARBONS						
BTEX (benzene, toluene, ethylbenzene and O,M,P xylenes)	Batch/Weekly	Grab	2.0 [a]	SW 846 8021/ 8260	1.0	2.0
Diesel and Oil-Range Hydrocarbons (NWTPH-Dx) [b]	Batch/Weekly	Grab	250 [a]	NWTPH-Dx	250	250
Gasoline- Range Hydrocarbons (NWTPH-Gx) [c]	Batch/Weekly	Grab	250 [a]	NWTPH-Gx	250	250
METALS						
Aluminum, Total (7429-90-5)	Batch/Weekly	Grab	240 [d]	200.8	19.3	100
Arsenic, Total (7440-38-2)	Batch/Weekly	Grab	69 [e]	200.8	0.153	1.0
Barium, Total (7440-39-3)	Batch/Weekly	Grab	1,000 [f]	200.8	0.369	5.0
Beryllium, Total (7440-41-7)	Batch/Weekly	Grab	1 [a]	200.8	0.213	1.0
Cadmium, Total (7440-43-9)	Batch/Weekly	Grab	42.25 [e]	200.8	0.05	0.25
Chromium, Total (7440-47-3)	Batch/Weekly	Grab	1100 [g]	200.8	5.6	20.0
Copper, Total (7440-50-8)	Batch/Weekly	Grab	5.78 [e]	200.8	0.4	2.0
Iron, Total (7439-89-6)	Batch/Weekly	Grab	300 [h]	200.7	12.5	50
Lead, Total (7439-92-1)	Batch/Weekly	Grab	220.82 [e]	200.8	0.212	2.0
Manganese, total (7439-96-5)	Batch/Weekly	Grab	100 [i]	200.8	0.378	5.0
Mercury, Total (7439-97-6)	Batch/Weekly	Grab	2118 ng/L [e]	1631E	0.2 ng/L	0.5 ng/L
Molybdenum, total (7439-98-7)	Batch/Weekly	Grab	5.0 [a]	200.8	0.351	5.0
Nickel, Total (7440-02-0)	Batch/Weekly	Grab	74.75 [e]	200.8	0.165	2.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Selenium, Total (7782-49-2)	Batch/Weekly	Grab	290.58 [e]	200.8	1.0	1.0
Silver, Total (7440-22-4)	Batch/Weekly	Grab	2.24 [e]	200.8	0.119	1.0
Strontium (7440-24-6)	Batch/Weekly	Grab	10.0 [a]	200.7	1.1	10.0
Thallium, Total (7440-28-0)	Batch/Weekly	Grab	1.0 [a]	200.8	0.195	1.0
Titanium (7440-32-6)	Batch/Weekly	Grab	10.0 [a]	200.8	1.33	10.0
Vanadium (7440-62-2)	Batch/Weekly	Grab	12.5 [a]	200.8	0.408	5.0
Zinc, Total (7440-66-6)	Batch/Weekly	Grab	95.14 [e]	200.8	2.19	20.0
POLYCYCLIC AROMATIC HYDROCARBONS (PAH) AND CARCINOGENIC PAHs						
Acenaphthene (83-32-9)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Acenaphthylene (208-96-8)	Batch/Weekly	Grab	10.5 [a]	625.1	3.5	10.5
Benzo(a)anthracene (56-55-3)	Batch/Weekly	Grab	23.4 [a]	625.1	7.8	23.4
Benzo(a)pyrene (50-32-8)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Benzo(b)fluoranthene (205-99-2)	Batch/Weekly	Grab	14.4 [a]	610/625.1	4.8	14.4
Benzo(g,h,i)perylene (191-24-2)	Batch/Weekly	Grab	12.3 [a]	610/625.1	4.1	12.3
Benzo(k)fluoranthene (207-08-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Chrysene (218-01-9)	Batch/Weekly	Grab	7.5 [a]	610/625.1	2.5	7.5
Fluoranthene (206-44-0)	Batch/Weekly	Grab	6.6 [a]	625.1	2.2	6.6
Fluorene (86-73-7)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
Indeno(1,2,3-cd)pyrene (193-39-5)	Batch/Weekly	Grab	11.1 [a]	610/625.1	3.7	11.1
1-Methylnaphthalene (90-12-0)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
2-Methylnaphthalene (91-57-6)	Batch/Weekly	Grab	10.0 [a]	8270	10.0	10.0
Naphthalene (91-20-3)	Batch/Weekly	Grab	4.8 [a]	625.1	1.6	4.8
Phenanthrene (85-01-8)	Batch/Weekly	Grab	16.2 [a]	625.1	5.4	16.2
Pyrene (129-00-0)	Batch/Weekly	Grab	5.7 [a]	625.1	1.9	5.7
VOLATILE ORGANIC COMPOUNDS (VOC), SEMI-VOCs AND HALOGENATED VOCs						
Acetone (67-64-1)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
Benzoic Acid (65-85-0)	Batch/Weekly	Grab	50 [a]	8270	10	50
2-Butanone (MEK) (78-93-3)	Batch/Weekly	Grab	5.0 [a]	624.1/8260	5.0	5.0
n-Butylbenzene (104-51-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
sec-Butylbenzene (135-98-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Butylbenzylphthalate (85-68-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Carbazole (86-74-8)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Carbon Disulfide (75-15-0)	Batch/Weekly	Grab	10.0 [a]	624.1/8260	10	10
Chlorobenzene (108-90-7)	Batch/Weekly	Grab	18.0 [a]	624.1	6.0	18.0
Chloroethane (75-00-3)	Batch/Weekly	Grab	2 [a]	624.1/601	1	2
Chloroform (67-66-3)	Batch/Weekly	Grab	4.8 [a]	624.1 or SM6210B	1.6	4.8
Dibenzofuran (132-64-9)	Batch/Weekly	Grab	0.01 [a]	8270	0.01	0.01
Diethylphthalate (84-66-2)	Batch/Weekly	Grab	1.9 [a]	625.1	1.9	5.7
1,2-Dichlorobenzene (95-50-1)	Batch/Weekly	Grab	7.6 [a]	624.1	1.9	7.6
1,4-Dichlorobenzene (106-46-7)	Batch/Weekly	Grab	17.6 [a]	624.1	4.4	17.6
Cis-1,2-Dichloroethene (156-59-2)	Batch/Weekly	Grab	4.8 [a]	624.1	1.6	4.8
2,4-Dimethylphenol (105-67-9)	Batch/Weekly	Grab	8.1 [a]	625.1	2.7	8.1
bis(2-ethylhexyl)phthalate (117-81-7)	Batch/Weekly	Grab	7.5 [a]	625.1	2.5	7.5
Isopropylbenzene (98-82-8)	Batch/Weekly	Grab	1.0 [a]	624/8260	1.0	1.0
2-Methylphenol (o-Cresol) (95-48-7)	Batch/Weekly	Grab	10 [a]	625.1	3.5	10
(3+4) Methyphenol (m,p-cresol) (65794-96-9)	Batch/Weekly	Grab	20 [a]	625.1/8270E	7	20
4-Methyl-2-pentanone (MIBK) (108-10-1)	Batch/Weekly	Grab	5.0 [a]	624.1	1.9	5.0
N-Nitrosodiphenylamine (86-30-6)	Batch/Weekly	Grab	2.0 [a]	625.1	1.0	2.0
Pentachlorophenol (87-86-5)	Batch/Weekly	Grab	13 [e]	625.1	3.6	10.8
Phenol (108-95-2)	Batch/Weekly	Grab	4.5 [a]	625.1	1.5	4.5

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
n-propylbenzene (103-65-1)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
Tetrachloroethylene (127-18-4)	Batch/Weekly	Grab	12.3 [a]	624.1	4.1	12.3
2,3,4,6-Tetrachlorophenol (58-90-2)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.38	2.5
2,4,5-Trichlorophenol (95-95-4)	Batch/Weekly	Grab	1 [h]	EPA 1653	0.57	2.5
1,2,4 –Trimethylbenzene (95-63-6)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
1,3,5 –Trimethylbenzene (108-67-8)	Batch/Weekly	Grab	1.0 [a]	624.1/8260	1.0	1.0
POLYCHLORINATED BIPHENYLS (PCBs)						
PCBs, Total [j]	Batch/Weekly	Grab	10.0 [e]	608.3	0.192	0.5
PESTICIDES						
Alpha-BHC (319-84-6)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0277	0.05
4,4'-DDD (72-54-8)	Batch/Weekly	Grab	1.10 [l]	608.3	0.011	0.033
4,4'-DDE (72-55-9)	Batch/Weekly	Grab	1.10 [l]	608.3	0.004	0.012
4,4'-DDT (50-29-3)	Batch/Weekly	Grab	130 ng/L [e]	608.3	0.0211	0.05
Aldrin (309-00-2)	Batch/Weekly	Grab	0.71 [k]	608.3	0.0249	0.05
Delta-BHC (319-86-8)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0403	0.05
Dieldrin (60-57-1)	Batch/Weekly	Grab	0.71 [e]	608.3	0.0298	0.05
Endosulfan II (33213-65-9)	Batch/Weekly	Grab	0.05 [m]	608.3	0.0311	0.05
Gamma-Chlordane (5103-74-2)	Batch/Weekly	Grab	0.05 [a]	608.3	0.0137	0.05
Endosulfan sulfate (1031-07-8)	Batch/Weekly	Grab	198 ng/L [a]	608.3	0.0306	0.05
Endrin Aldehyde (7421-93-4)	Batch/Weekly	Grab	70 ng/L [a]	608.3	0.0358	0.05
Methoxychlor (72-43-5)	Batch/Weekly	Grab	0.05 [n]	608.3	0.04	0.05
DIOXIN/FURAN CONGENERS						
1,2,3,6,7,8-Hexachlorodibenzo-P-Dioxin (HxCDD) (57653-85-7)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.43 pg/L	50 pg/L
1,2,3,7,8,9-Hexachlorodibenzo-P-Dioxin (HxCDD) (19408-74-3)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.29 pg/L	50 pg/L

Pollutant & CAS No. (if available)	Sampling Frequency*	Sample Type	Indicator Level, µg/L unless otherwise noted	Required Analytical Protocol	Detection Level, µg/L unless otherwise noted	Quantitation Level, µg/L unless otherwise noted
1,2,3,4,6,7,8-Heptachlorodibenzo-P-Dioxin (HpCDD) (35822-46-9)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	0.982 pg/L	50 pg/L
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (3268-87-9)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	3.14 pg/L	100 pg/L
2,3,7,8-Tetrachlorodibenzofuran (TCDF) (51207-31-9)	Batch/Weekly	Grab	5.0 pg/L [a]	1613/8290A	1.3 pg/L	5.0 pg/L
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF) (67562-39-4)	Batch/Weekly	Grab	50 pg/L [a]	1613/8290A	1.28 pg/L	50 pg/L
Octachlorodibenzofuran (OCDF) (39001-02-0)	Batch/Weekly	Grab	100 pg/L [a]	1613/8290A	2.59 pg/L	100 pg/L

CONSTRUCTION STORMWATER GENERAL PERMIT BENCHMARKS				
Parameter	**Sampling Frequency***	**Sample Type**	**Benchmark**	**Analytical Method**
Turbidity	Batch/Weekly	Grab	25 NTU	SM2130 [o]
pH	Batch/Weekly	Grab	6.5 - 8.5 SU	SM4500-H^+ B

NOTES	
a	No applicable surface water criterion, value is laboratory quantitation level.
b	NWTPH-Dx = Northwest Total Petroleum Hydrocarbons – Semi-volatile (“diesel”) for diesel range organics and heavy oils (includes jet fuels, kerosene, diesel-oils, hydraulic fluids, mineral oils, lubricating oils, and fuel oils).
c	NWTPH-Gx = Northwest Total Petroleum Hydrocarbons – Volatile petroleum products including aviation and automotive gasolines, mineral spirits, Stoddard solvent, and naphtha.
d	Acute Freshwater Criteria from “Final Aquatic Life Ambient Water Quality Criteria for Aluminum, Table K-1”; United States Environmental Protection Agency; December 2018. Based on pH 7.0 and Total Hardness of 50 mg/L.
e	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) calculated using conversion factors per Table 240.
f	Applicable surface water criterion does not exist for barium. The indicator level of 1,000 µg/L for barium is based on groundwater quality standards to be protective of human health and the environment.
g	Indicator Level total chromium is actually for hexavalent chromium using Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) because there is no water quality standard for total chromium.
h	Organoleptic Effect Criteria, National Recommended Water Quality Criteria, United States Environmental Protection Agency.
i	The human health criteria for consumption of water+ organism from National Recommended Water Quality Criteria - Human Health Criteria Table (1993)/ Criteria for domestic water supply from the Quality Criteria for Water, 1986 ("Gold Book").
j	Total PCBs are the sum of all congener or all isomer or homolog or Aroclor analyses.
l	Acute – Freshwater Toxic Substances Criteria (WAC 173-201A-240).
k	Acute – Marine Water Toxic Substances Criteria (WAC 173-201A-240) 2016. Aldrin is metabolically converted to Dieldrin. Therefore, the sum of the Aldrin and Dieldrin concentrations are compared with the Dieldrin criteria.
m	Acute Aquatic Life Criteria-Saltwater from EPA National Recommended WQ Criteria (2012).
n	Chronic Aquatic Life Criteria -Saltwater from Toxic Substances Criteria (WAC 173-201A-240) 2016.
o	Or equivalent.
*	If permission granted for flow-through, sampling will then be weekly.

2. Failure to Comply With This Order

Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

3. Your Right to Appeal

You have a right to appeal this Order to the Pollution Control Hearings Board (PCHB) within thirty (30) days of the date of receipt of this Order. The appeal process is governed by Chapter 43.21B RCW and Chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal, you must do all of the following within thirty (30) days of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see address below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology by mail or in person or by email (see addresses below).

You must also comply with other applicable requirements in Chapter 43.21B RCW and Chapter 371-08 WAC.

Filing with the PCHB

For the most current information regarding filing with the PCHB, visit: https://eluho.wa.gov/ or call: 360-664-9160.

Service on Ecology

Street Address:
Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Mailing Address:
Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

E-Mail Address:
ecologyappeals@ecy.wa.gov

4. Contact Information

Please direct all questions about this Amended Administrative Order to:

Sylvia Graham
Department of Ecology
Bellingham Field Office
913 Squalicum Way #101
Bellingham, WA 98225-2078

Phone: (360) 927-4900
Email: sylvia.graham@ecy.wa.gov

5. More Information

- **Pollution Control Hearings Board Website:**
  https://www.eluho.wa.gov/
- **Chapter 43.21B RCW – Environmental and Land Use Hearings Office – Pollution Control Hearings Board:**
  https://app.leg.wa.gov/RCW/default.aspx?cite=43.21B
- **Chapter 371-08 WAC – Practice and Procedure**
  https://app.leg.wa.gov/WAC/default.aspx?cite=371-08
- **Chapter 34.05 RCW – Administrative Procedure Act**
  https://app.leg.wa.gov/RCW/default.aspx?cite=34.05
- **Ecology's Laws, Rules, & Rulemaking Website**
  https://ecology.wa.gov/Footer/rulemaking

6. Signature

Rachel McCrea

Rachel McCrea
Water Quality Section Manager
Northwest Region Office

April 30, 2025

Date

Skagit County Public Works
March Point Landfill Site Cleanup Action

Substantive Section 401 Water Quality Certification Requirements

Aquatics #141455
Corps Reference #NWS-2021-477

May 22, 2023

A. General Requirements

A1. The Project Proponent shall construct the project in a manner consistent with the following documents, or as otherwise approved by Ecology:

- JARPA received by Ecology on August 11, 2022.
- Email from Amy Hargrove, Ecology, to Chris Luerkens and Rebekah Padgett, Ecology, Subject: *RE: FW March Point BNSF and 401 Water Quality*, received February 24, 2023.

A2. Provide notice to Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, Susannah.Edwards@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov. The submittals will be identified with Aquatics #141455, Corps Reference #2021-477, and include the project name, project contact, and the contact's phone number.

a. At least three (3) days prior to the start of construction,
b. Within 14 days after completion of construction at the project site,
c. At least ten (10) days prior to the onset of work at the mitigation site.
d. Within ten (10) days after completing work at the mitigation site.

A3. Submit a written construction status report annually during construction activities to: Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, Susannah.Edwards@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov.

A4. Before undertaking any major changes to the proposed project that could significantly and adversely affect water quality, other than those project changes required herein, Skagit County Public Works must provide documentation to Ecology for review and approval.

A5. Any proposed in-water (including wetlands) work not covered under the U.S. Army Corps of Engineers (Corps) Nationwide Permit #38 authorization, Corps Reference

#NWS-2021-477, issued on November 30, 2022, will be subject to Ecology review and approval.

B. Material Management:

B1. Any contaminated material removed from the project site must be placed in an upland location so that it does not re-enter state waters, including but not limited to streams, wetlands, lakes, rivers, estuaries, marine waters, or any other waters of the state.

C. Water Quality Monitoring & Criteria:

C1. Applicable water quality standards must be met as established in Chapter 173-201A-WAC.

C2. Applicable turbidity standards must be met as established in WAC 173-201A-210(1)(e)(i) for Padilla Bay Lagoon.

C3. Conduct all excavation activities in the dry to the maximum extent practicable.

D. Construction:

D1. Construction stormwater, sediment, and erosion control best management practices (BMPs; *e.g.*, filter fences, etc.) suitable to prevent exceedances of state water quality standards will be in place before starting construction at the site.

D2. Sediment and erosion control measures will be inspected and maintained prior to and during project implementation.

D3. Obtain and comply with the conditions of the Construction Stormwater General Permit (National Pollutant Discharge Elimination System - NPDES) issued for this project.

D4. No petroleum products, fresh concrete, lime or concrete, chemicals, or other toxic or deleterious materials may be allowed to enter waters of the state.

D5. Properly dispose of all construction debris on land so that it cannot enter a waterway or cause water quality degradation to state waters.

D6. Service, fuel, and maintain machinery and equipment used during construction upland, unless otherwise approved by Ecology, in order to prevent contamination to any surface water.

D7. Equipment used for this project must be free of external petroleum-based products while used around the waters of the state, including wetlands.

D8. Check fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., regularly for drips or leaks, and maintain and store properly to prevent spills into state waters.

D9. Contain wash water containing oils, grease, or other hazardous materials resulting from wash down of equipment or working areas for proper disposal, and do not discharge into state waters or storm drains.

D10. Remove and dispose of all manmade debris that has been deposited below the Ordinary High Water Mark within the construction work area upland such that it does not enter waters of the state. Concrete blocks, metal debris, cables, submerged timbers and other debris in the construction work corridor that have washed into marine areas must be removed from the project area.

D11. Clean Fill Criteria: Applicant shall ensure that fill (soil, sand, cap, or other material) placed for the proposed project does not contain toxic materials in toxic amounts.

D11. Work in or near the water that may affect fish migration, spawning, or rearing must cease immediately upon a determination by Ecology that fisheries resources may be adversely affected.

E. Wetlands:

E1. Wetland and buffer mitigation is described in *Critical Areas Assessment Report,* for *Whitmarsh Landfill,* prepared by Hammer Environmental, and dated October 12, 2021. A final wetland and buffer mitigation plan will be submitted in writing to Ecology (see E2) for review and approval.

E2. Required mitigation documentation submittals will be sent via email to Susannah.Edwards@ecy.wa.gov, fednotification@ecy.wa.gov and cc: chris.luerkens@ecy.wa.gov. The submittals will be identified with Aquatics #141455, Corps Reference #NWS-2021-477, and include the project name, project contact, and the contact's phone number.

E3. Skagit County Public Works will provide access to the project site and all mitigation areas upon request by Ecology personnel for site inspections, monitoring, and/or necessary data collection, to ensure that conditions are being met.

E4. Aquatic herbicides can be used or applied only by certified applicators or persons under the direct supervision of a certified applicator, and only for those uses covered by the certified applicator's license category.

E5. If seeding is used for temporary erosion control, it must be a seed mix consisting of native, annual, non-invasive plant species, unless otherwise approved by Ecology.

Monitoring and Maintenance

E6. Water and maintain all plantings so as to meet the performance standards. If an irrigation system is installed, it must be removed by the end of year three unless Ecology authorizes in writing the system to remain for a longer period.

E7. The mitigation areas will be monitored for a minimum of 5 years or as approved by Ecology.

E8. Monitoring reports will be submitted to Ecology for years 1, 2, 3, and 5 documenting the mitigation areas.

E9. Ecology must be consulted and provide written approval prior to implementation of any contingency measures.

E10. When necessary to meet the performance standards, dead or dying plants will be replaced with the same species, or an appropriate native plant alternative, during the current or upcoming planting season and note species, numbers, and approximate locations of all replacement plants in the subsequent monitoring report.

F. Emergency/Contingency Measures:

F1. Develop and implement a Spill Prevention and Containment Plan for all aspects of this project.

F2. Adequate and appropriate spill response materials must be kept on hand to respond to emergency release of petroleum products or any other material into waters of the state.

F3. Check fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc. regularly for drips or leaks, and maintain and store properly to prevent spills into state waters.

F4. Any work that is out of compliance with these provisions, or conditions causing distressed or dying fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these occur, immediately take the following actions:

a. Cease operations at the location of the violation or spill.

b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

c. Notify Ecology of the failure to comply. All oil spills must be reported immediately to Ecology's 24-Hour Spill Response Team at 1-800-258-5990, **and** within 24 hours of spills or other events to Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov.

d. Submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

From: Luerkens, Chris (ECY) <CLUE461@ECY.WA.GOV>
Sent: Thursday, September 4, 2025 7:42 AM
To: Tahghighi, Koorus; Edwards, Susannah (ECY); Hargrove, Amy (ECY); ECY RE FED NOTIFICATION
(SEA)
Cc: Horne, David C. (ECY); Margo Gillaspy; Russell Thompson; Whitmus Jr., Cliff
Subject: RE: Whitmarsh Landfill-Aquatics 141455
Attachments: Whitmarsh WQ Cert Change_Sx (002).pdf

Hello Koorus,

Thank you for the detailed letter dated June 20, 2025, addressing Ecology comments regarding the
proposed plan to discharge treated groundwater during remediation work at the Whitmarsh Landfill
site. The treated water would outfall to a swale located along the west/south side of the site.
Ecology requested additional details about the about the discharge outfall, and wanted more
information about how the this might impact existing wetlands located within and downstream of
the swale.

Based on review of the information provided, Ecology concurs with WSP's determination that the
proposed discharge would likely have a relatively minor and temporary impact to wetland
hydrology, lasting only a few months. Ecology has no additional concerns regarding impacts of the
outfall to wetlands on the site. We find the proposal consistent with the "Substantive Section 401
Water Quality Certification Requirements" dated May 22, 2023, and we will not need to amend that
document based on the proposed outfall. Please let me know if you have any questions about this
email. You can also contact Havid Horne if there are other questions about the project.

Thanks,

Chris Luerkens | Shorelands & Wetlands Permit Specialist | Department of Ecology | cell: 360-410-4807
|chris.luerkens@ecy.wa.gov

This communication is a public record and may be subject to disclosure as per the Washington State Public Records Act (RCW 42.56)

From: Tahghighi, Koorus <koorus.tahghighi@wsp.com>
Sent: Friday, June 20, 2025 3:19 PM
To: Luerkens, Chris (ECY) <CLUE461@ECY.WA.GOV>; Edwards, Susannah (ECY)

<sued461@ECY.WA.GOV>; Hargrove, Amy (ECY) <ahar461@ECY.WA.GOV>; ECY RE FED NOTIFICATION
(SEA) <fednotification@ECY.WA.GOV>
Cc: Horne, David C. (ECY) <hoda461@ECY.WA.GOV>; Margo Gillaspy <margog@co.skagit.wa.us>; Russell
Thompson <russellt@co.skagit.wa.us>; Whitmus Jr., Cliff <cliff.whitmus@wsp.com>
Subject: Whitmarsh Landfill-Aquatics 141455

External Email
Mr. Luerkens:
The attached letter is our response to the comments we received on our previous letter about
discharge of treated groundwater to surface water during the remediation of Whitmarsh Landfill in
Anacortes. We trust we have provided the information you requested. Please let us know if you
have any questions, or if you require additional information.

Regards,
Koorus

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Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Corps NWP 38	Must ensure the work is performed in accordance with the enclosed NWP 38, Terms and Conditions.	Work waterward of the high tide line (10.27 feet MLLW datum) may only occur when tidal elevations are 8.00 feet (MLLW) or lower. No work may occur when tidal elevations are higher than 8.00 feet (MLLW).	Contractor	No
		Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.	Contractor	No
		No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts.	Contractor	No
		Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.	Contractor	No
		Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.	Contractor	No
		No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.	Skagit County/Contractor	No
		The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act..... The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds....	Skagit County	Yes
		Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed.	Skagit County	Yes
		The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).	Skagit County	No
		Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include: (a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions; (b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and (c) The signature of the permittee certifying the completion of the activity and mitigation. (d) The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.	Skagit County	Yes
		Permittees must clearly mark all construction area boundaries within waters of the United States before beginning work on projects that involve grading or placement of fill. Boundary markers and/or construction fencing must be maintained and clearly visible for the duration of construction. Permittees should avoid and minimize removal of native vegetation (including submerged aquatic vegetation) to the maximum extent possible.	Contractor	No

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Corps NWP 38	Must ensure the work is performed in accordance with the enclosed NWP 38, Terms and Conditions.	For any nationwide permit that may affect threatened or endangered species; Incidents where any individuals of fish species, marine mammals and/or sea turtles listed by National Oceanic and Atmospheric Administration Fisheries, National Marine Fisheries Service (NMFS) under the Endangered Species Act appear to be injured or killed as a result of discharges of dredged or fill material into waters of the U.S. or structures or work in navigable waters of the U.S. authorized by this Nationwide Permit verification shall be reported to NMFS, Office of Protected Resources at (301) 713-1401 and the Regulatory Office of the Seattle District of the U.S. Army Corps of Engineers at (206) 764-3495. The finder should leave the animal alone, make note of any circumstances likely causing the death or injury, note the location and number of individuals involved and, if possible, take photographs. Adult animals should not be disturbed unless circumstances arise where they are obviously injured or killed by discharge exposure or some unnatural cause. The finder may be asked to carry out instructions provided by the NMFS to collect specimens or take other measures to ensure that evidence intrinsic to the specimen is preserved.	Skagit County	Yes
		All projects involving land disturbance or impervious surfaces must implement stormwater pollution prevention or control measures to avoid discharge of pollutants in stormwater runoff to waters. a. For land disturbances during construction, the applicant must obtain and implement permits (e.g., Construction Stormwater General Permit) where required and follow Ecology's current stormwater manual. b. Following construction, prevention or treatment of on-going stormwater runoff from impervious surfaces shall be provided.	Skagit County	No
	Implement and abide by the Endangered Species Act (ESA) requirements and/or agreements set forth in the documents titled, "Biological Evaluation for Informal ESA Consultation for NWS-2021-477 (Corps Reference Number)"	Work activities will be conducted from the upland at low tide when the work can be conducted "in the dry." The work will be conducted during daylight hours during very low tides, which occur only during May through August.	Contractor	No
		Shoreline-based excavation equipment will be always on land and will excavate only when the tide is below the edge of the excavation.	Contractor	No
		Shoreline-based excavation equipment will always be at least 2 feet back from the actual water line.	Contractor	No
		On an outgoing tide, work will progress down the bank always keeping the excavation in the dry and on an incoming tide work will progress up the bank.	Contractor	No
		A layer of material or geotextile fabric will be placed over any exposed soil at the end of every tide cycle.	Contractor	No
		Temporary Erosion and Sediment Control (TESC) measures will be included in the design documents and a TESC plan will be developed by the contractor prior to site work.	Skagit County/Contractor	No
		During the waste excavation and handling, a representative will be on site and will inspect the excavated material visually for the presence of potentially regulated waste. Olfactory observations will also be used (e.g., petroleum odor, etc.) to screen for potentially regulated waste. Any such waste that is identified (e.g., car batteries) will be set aside with a "waste pending analysis" label, profiled, and shipped off site to an appropriate recycling or disposal facility.	Skagit County	No
		Prior to excavating along the shoreline, a trench will be excavated near the top of the shoreline slope to intercept groundwater or surface water runoff to reduce the potential of migration of contaminated water off site.	Contractor	No
		The shoreline excavation will be conducted in strips perpendicular to the shoreline. The width of the strips will be such that the segment is excavated, graded, and the modified bentonite clay GCLL with polymer is placed during one tide cycle.	Contractor	No
		During the excavation along the shoreline, dewatering pits will be excavated near the shoreline to dewater the waste prior to the start of shoreline excavation.	Contractor	No
		Temporary erosion control measures will be installed and maintained, and a treatment system will be set up that will process both any accumulated stormwater and the perched groundwater/leachate generated from dewatering to a degree that meets the discharge standards for the publicly owned treatment works.	Contractor	No
		All applicable permits for the project will be obtained prior to construction. Construction and operation will be performed according to the requirements and conditions of these permits.	Skagit County/Contractor	No
		In-water construction activities will comply with state water quality standards.	Contractor	No
		The Contractor will be responsible for preparing a Materials Management Plan for handling and disposing of excavated material during construction and complying with the Ecology Consent Decree Materials Management Plan.	Contractor	No

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Corps NWP 38	Implement and abide by the Endangered Species Act (ESA) requirements and/or agreements set forth in the documents titled, "Biological Evaluation for Informal ESA Consultation for NWS-2021-477 (Corps Reference Number)"	All equipment to be used for construction activities will be cleaned and inspected prior to arriving at the project site to ensure no leaks are present and the equipment is functioning properly.	Contractor	No
		Soil stabilization BMPs will be used to stabilize soils, including stockpiles. These BMPs will consist of compost blankets, seeding and mulching, or matting/rolled erosion control products. Compost blankets can be used as temporary erosion control and then be mixed into the soil to help meet the post construction soil requirements.	Skagit County/Contractor	No
		Erosion control BMPS, such as compost stocks, berms or blankets, filter fence, straw wattles, containment berms, brush barrier, gravel filter berm, a sediment pond, or sediment traps, will be implemented to prevent the transport of soil from the project site. Sandbags also may be utilized to prevent sediment from being discharged off site.	Contractor	No
		Create 0.35 acre (15,480 square feet) of new area that will be tidally influenced below high tide line (HTL), at elevation 10.27 feet MLLW, and suitable for natural colonization by marsh plants from the adjacent Padilla Bay inner lagoon.	Skagit County	No
		1.37 acres (59,480 square feet) of the shoreline (2,315 linear feet) will be planted with native shrubs suitable for the estuarine environments associated with the Padilla Bay inner lagoon (Shrub Riparian Area [From HTL to 16 feet MLLW]).	Skagit County	No
		An approved Habitat Maintenance Plan will be implemented to ensure that newly planted vegetation becomes established and is not out-competed by invasive species or destroyed by herbivores.	Skagit County	No
	Must implement and abide by the applicable terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" and the applicable Essential Fish Habitat Conservation Recommendations as set forth in the Salish Sea Nearshore Programmatic (SSNP) Biological Opinion (BO) (National Marine Fisheries Service (NMFS) Reference Number WCRO-2019-04086) dated June 29, 2022).	Minimize incidental take by ensuring that all applicable design criteria, general construction measures, and other requirements of the proposed action are applied for projects carried out under the SSNP programmatic action.	Skagit County	No
		Ensure completion of a monitoring and reporting program.	Skagit County	No
		Report and monitor for incidental take pathways that extend beyond the Corps jurisdiction or authority to NMFS (i.e. the maintenance of stormwater facilities).	Skagit County	No
		Applicants shall report any noncompliance with applicable design criteria, general construction measures, or other requirements to NMFS and the Corps. The requirement to report noncompliance applies to all activities regardless of Corps authority or jurisdiction.	Skagit County	Yes
		For in-water construction: Implement the best management practices and conservation measures by conducting water quality monitoring during structure removal and construction activities. At point of compliance (per state permit), turbidity levels shall not exceed 5 nephelometric turbidity units (NTUs) more than background turbidity when the background turbidity is 50 NTUs or less, or there shall not be more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTUs.	Skagit County	No
		Use soft approaches (e.g., beach nourishment, soft or hybrid armoring, vegetative plantings, and placement of LWD) in lieu of "hard" shoreline stabilization and modifications (such as concrete bulkheads and seawalls, concrete or rock revetments), where appropriate and feasible.	Skagit County	No
		If planting in the riparian zone, use an adaptive management plan with ecological indicators and performance standards to oversee monitoring and ensure mitigation objectives are met, unless it is contrary to a Corps approved riparian planting plan.	Skagit County	No
	The specific General Construction Measures, Project Design Criteria, Essential Fish Habitat Conservation Measures, and monitoring and/or reporting requirements applicable to this permit are identified in the enclosed Notification Summary Sheet dated November 30, 2022 (NMFS Reference Number WCRO-2019-0466-5158).	Submission to NMFS the Certificate of Compliance with Department of Army Permit per the terms of the Corps Permit.	Skagit County	Yes
		Must submit written confirmation to the Corps and NMFS, that they implemented their verified habitat improvement plan (e.g., planted vegetation consistent with the planting plan, removed proposed piles, etc.) within 60 days from completing those conservation offsets. Per Option 2, all offsets must be completed within three years from impacting project's construction start date, thus this confirmation must be submitted within three years and 60 days from the impacting project's construction start date at the latest.	Skagit County	Yes
		If project changes occur following verification, the applicant must alert the Corps and NMFS and confirm whether re-verification under SSNP is needed. Failure to do so may invalidate ESA take exemption.	Skagit County	Yes
		To the extent feasible, retain natural vegetation, limit impermeable surfaces, limit duration of in-water work and otherwise minimize the extent and duration of earthwork (e.g., compacting, dredging, drilling, excavation, and filling).	Skagit County/Contractor	No

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Corps NWP 38	The specific General Construction Measures, Project Design Criteria, Essential Fish Habitat Conservation Measures, and monitoring and/or reporting requirements applicable to this permit are identified in the enclosed Notification Summary Sheet dated November 30, 2022 (NMFS Reference Number WCRO-2019-0466-5158).	Use site planning and site erosion control measures commensurate with the scope of the project to minimize damage to natural vegetation and permeable soils and prevent erosion and sediment discharge from the project site.	Skagit County	No
		Before significant earthwork begins, install appropriate, temporary erosion controls downslope to prevent sediment deposition in the riparian area, wetlands, or water body. In tidal areas, plan work in dry areas as much as possible.	Contractor	No
		During construction: i. Complete earthwork in wetlands, riparian areas, and stream channels as quickly as possible. ii. Cease project operations when high flows may inundate the project area, except for efforts to avoid or minimize resource damage. iii. If eroded sediment appears likely to be deposited in the stream during construction, install additional sediment barriers as necessary. iv. Temporary erosion control measures may include fiber wattles, silt fences, jute matting, wood fiber mulch and soil binder, or geotextiles and geosynthetic fabric. v. Soil stabilization using wood fiber mulch and tackifier (hydro-applied) may be used to reduce erosion of bare soil, if the materials are free of noxious weeds and non-toxic to aquatic and terrestrial animals, soil microorganisms, and vegetation. vi. Inspect and monitor pollution and erosion control measures throughout the length of the project. vii. Remove sediment from erosion controls if it reaches one-third of the exposed height of the control. viii. Whenever surface water is present, maintain a supply of sediment control materials and an oil-absorbing floating boom at the project site. ix. Stabilize all disturbed soils following any break in work unless construction will resume within four days.	Contractor	No
		Remove temporary erosion controls after construction is complete and the site is fully stabilized.	Contractor	No
WDFW Advisory HPA		Work may occur at any time, provided: (a) all work is conducted in the dry at low tide only; (b) conditional authorization required October 16 through January 14 (following an intertidal forage fish spawning survey) for work near the upper beach areas for: (1) work above 5.8 feet mean lower low water (MLLW) for smelt protection and (2) work above 3.85 feet MLLW for sand lance protection.	Skagit County	No
		The Habitat Biologist (HB) shall be notified of the project start date.	Skagit County	Yes
		Establish the staging area (used for activities such as equipment storage, vehicle storage, fueling, servicing and hazardous material storage) in a location and manner that will prevent contaminants like petroleum products, hydraulic fluid, sediments, sediment-laden water, chemicals, or any other toxic or harmful materials from entering waters of the state.	Contractor	No
		Check equipment daily for leaks and complete any required repairs before using the equipment in or near the water.	Contractor	No
		Lubricants composed of biodegradable base oils such as vegetable oils, synthetic esters, and polyalkylene glycols are recommended for use in equipment operated in or near water.	Contractor	No
		Limit the use of equipment below the OHWL to that necessary to gain position for the work.	Contractor	No
		Do not conduct work activities when the project area is inundated by tidal waters.	Contractor	No
		Erosion control devices such as silt fences and debris booms shall be placed prior to the start of excavation.	Contractor	No
		Existing concrete and anthropogenic debris shall be removed from the shoreline and disposed of at an approved upland facility.	Skagit County/Contractor	No
		Demolition activities should occur outside of the heron breeding season (April through July).	Skagit County/Contractor	No
		The GCLL cap shall be installed per approved plans.	Contractor	No
		The source of all import material shall be approved by Department of Ecology prior to material being brought to the site.	Skagit County/Contractor	No
		If at any time, as a result of project activities, fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills), the Washington Military Department's Emergency Management Division shall be immediately contacted at 1-800-258-5990.	Skagit County	Yes
		No petroleum products or other deleterious materials shall enter state waters.	Contractor	No
		Project activities shall not degrade water quality to the detriment of fish life.	Contractor	No

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Substantive Section 401 Water Quality Certification	General Requirements	Provide notice to Ecology's Headquarters Office, Attn: Federal Permit Manager, via e- mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, Susannah.Edwards@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov. The submittals will be identified with Aquatics #141455, Corps Reference #2021-477, and include the project name, project contact, and the contact's phone number. a. At least three (3) days prior to the start of construction, b. Within 14 days after completion of construction at the project site, c. At least ten (10) days prior to the onset of work at the mitigation site. d. Within ten (10) days after completing work at the mitigation site.	Skagit County	Yes
		Submit a written construction status report annually during construction activities to: Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, Susannah.Edwards@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov.	Skagit County	Yes
		Before undertaking any major changes to the proposed project that could significantly and adversely affect water quality, other than those project changes required herein, Skagit County Public Works must provide documentation to Ecology for review and approval.	Skagit County	Yes
		Any proposed in-water (including wetlands) work not covered under the U.S. Army Corps of Engineers (Corps) Nationwide Permit #38 authorization, Corps Reference #NWS-2021-477, issued on November 30, 2022, will be subject to Ecology review and approval.	Skagit County	Yes
	Material Management	Any contaminated material removed from the project site must be placed in an upland location so that it does not re-enter state waters, including but not limited to streams, wetlands, lakes, rivers, estuaries, marine waters, or any other waters of the state.	Contractor	No
	Water Quality Monitoring & Criteria	Applicable water quality standards must be met as established in Chapter 173-201A- WAC.	Skagit County	No
		Applicable turbidity standards must be met as established in WAC 173-201A-210(1)(e)(i) for Padilla Bay Lagoon.	Contractor	No
		Conduct all excavation activities in the dry to the maximum extent practicable.	Contractor	No
	Construction	Construction stormwater, sediment, and erosion control best management practices (BMPs; e.g., filter fences, etc.) suitable to prevent exceedances of state water quality standards will be in place before starting construction at the site.	Contractor	No
		Sediment and erosion control measures will be inspected and maintained prior to and during project implementation.	Skagit County/Contractor	No
		Obtain and comply with the conditions of the Construction Stormwater General Permit (National Pollutant Discharge Elimination System - NPDES) issued for this project.	Contractor	No
		No petroleum products, fresh concrete, lime or concrete, chemicals, or other toxic or deleterious materials may be allowed to enter waters of the state.	Contractor	No
		Properly dispose of all construction debris on land so that it cannot enter a waterway or cause water quality degradation to state waters.	Contractor	No
		Service, fuel, and maintain machinery and equipment used during construction upland, unless otherwise approved by Ecology, in order to prevent contamination to any surface water.	Contractor	No
		Equipment used for this project must be free of external petroleum-based products while used around the waters of the state, including wetlands.	Contractor	No
		Check fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., regularly for drips or leaks, and maintain and store properly to prevent spills into state waters.	Contractor	No
		Contain wash water containing oils, grease, or other hazardous materials resulting from wash down of equipment or working areas for proper disposal, and do not discharge into state waters or storm drains.	Contractor	No
		Remove and dispose of all manmade debris that has been deposited below the Ordinary High Water Mark within the construction work area upland such that it does not enter waters of the state. Concrete blocks, metal debris, cables, submerged timbers and other debris in the construction work corridor that have washed into marine areas must be removed from the project area.	Contractor	No
		Clean Fill Criteria: Applicant shall ensure that fill (soil, sand, cap, or other material) placed for the proposed project does not contain toxic materials in toxic amounts.	Skagit County/Contractor	No
		Work in or near the water that may affect fish migration, spawning, or rearing must cease immediately upon a determination by Ecology that fisheries resources may be adversely affected.	Skagit County/Contractor	No

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Substantive Section 401 Water Quality Certification	Wetlands	Wetland and buffer mitigation is described in Critical Areas Assessment Report, for Whitmarsh Landfill, prepared by Hammer Environmental, and dated October 12, 2021. A final wetland and buffer mitigation plan will be submitted in writing to Ecology (see E2) for review and approval.	Skagit County	Yes
		Required mitigation documentation submittals will be sent via email to Susannah.Edwards@ecy.wa.gov, fednotification@ecy.wa.gov and cc: chris.luerkens@ecy.wa.gov. The submittals will be identified with Aquatics #141455, Corps Reference #NWS-2021-477, and include the project name, project contact, and the contact's phone number.	Skagit County	Yes
		Skagit County Public Works will provide access to the project site and all mitigation areas upon request by Ecology personnel for site inspections, monitoring, and/or necessary data collection, to ensure that conditions are being met.	Skagit County	No
		Aquatic herbicides can be used or applied only by certified applicators or persons under the direct supervision of a certified applicator, and only for those uses covered by the certified applicator's license category.	Skagit County/Contractor	No
		If seeding is used for temporary erosion control, it must be a seed mix consisting of native, annual, non-invasive plant species, unless otherwise approved by Ecology.	Contractor	No
	Monitoring and Maintenance	Water and maintain all plantings so as to meet the performance standards. If an irrigation system is installed, it must be removed by the end of year three unless Ecology authorizes in writing the system to remain for a longer period.	Skagit County	No
		The mitigation areas will be monitored for a minimum of 5 years or as approved by Ecology.	Skagit County	No
		Monitoring reports will be submitted to Ecology for years 1, 2, 3, and 5 documenting the mitigation areas.	Skagit County	Yes
		Ecology must be consulted and provide written approval prior to implementation of any contingency measures.	Skagit County	Yes
		When necessary to meet the performance standards, dead or dying plants will be replaced with the same species, or an appropriate native plant alternative, during the current or upcoming planting season and note species, numbers, and approximate locations of all replacement plants in the subsequent monitoring report.	Skagit County	No
	Emergency/Contingency Measures	Develop and implement a Spill Prevention and Containment Plan for all aspects of this project.	Contractor	No
		Adequate and appropriate spill response materials must be kept on hand to respond to emergency release of petroleum products or any other material into waters of the state.	Contractor	No
		Check fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc. regularly for drips or leaks, and maintain and store properly to prevent spills into state waters.	Contractor	No
		Any work that is out of compliance with these provisions, or conditions causing distressed or dying fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these occur, immediately take the following actions: a. Cease operations at the location of the violation or spill. b. Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage. c. Notify Ecology of the failure to comply. All oil spills must be reported immediately to Ecology's 24-Hour Spill Response Team at 1-800-258-5990, and within 24 hours of spills or other events to Ecology's Headquarters Office, Attn: Federal Permit Manager, via e-mail to fednotification@ecy.wa.gov and cc to Rebekah.Padgett@ecy.wa.gov, Chris.Luerkens@ecy.wa.gov, and Amy.Hargrove@ecy.wa.gov. d. Submit a detailed written report to Ecology within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.	Skagit County/Contractor	Yes

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Washington Department of Ecology Administrative Order #23530	Construction Water Discharge Requirements	Skagit County Public Works must take the following actions to remain in compliance with NPDES Permit WAR313996: • Install all pre-treatment and treatment systems prior to any discharge of contaminated dewatering water or contaminated construction stormwater to the receiving waterbody. • Capture, contain, and treat all contaminated dewatering water or contaminated construction stormwater prior to discharge to the receiving waterbody. • Use an Ecology-approved treatment system and media filtration to treat any contaminated dewatering water or contaminated construction stormwater. • Ecology must be notified in advance if any changes in the treatment are made, with the exception of routine maintenance. • All captured sediment from the treatment of the contaminated dewatering water or contaminated construction stormwater must be transported to an approved disposal facility based on the level of contamination. The treatment system must have enough capacity to hold treated contaminated dewatering water or contaminated construction stormwater until it has been tested to determine if any of the Indicator Levels listed in Table 1 have been met.	Skagit County/Contractor	Yes
		If any of the Indicator Levels listed in Table 1 are exceeded, the treated contaminated dewatering water or contaminated construction stormwater must not be discharged to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1.	Skagit County/Contractor	No
		Skagit County Public Works may also discharge to sanitary sewer with the approval of the proper sewer authority.	Skagit County/Contractor	No
		Once the effectiveness of the treatment system has been determined, Skagit County Public Works may revert to a flow-through treatment system after a minimum of two sampling and testing events and upon written approval from Ecology. The flow-through treatment system design and batch sampling results must be submitted to Ecology for review prior to use. • If a flow-through treatment system is adopted, all contaminated dewatering water or contaminated construction stormwater must be sampled weekly while discharging and tested for the parameters listed in Table 1. • When using a flow-through treatment system, if any of the Indicator Levels listed in Table 1 are exceeded, Skagit County Public Works must stop the discharge of treated contaminated dewatering water or contaminated construction stormwater to the receiving waterbody until it has been retested to determine that all parameters are equal to or below the Indicator Levels in Table 1. If any of the Indicator Levels are exceeded after being retested, Skagit County Public Works must modify the existing flow-through treatment system to increase its effectiveness, install an additional Ecology-approved treatment system, or truck the contaminated construction stormwater or contaminated dewatering water off-site for disposal in an approved manner. Skagit County Public Works may also discharge the treated water to sanitary sewer in accordance with the conditions of the discharge authorization from the proper sewer authority. • Sampling for the contaminants listed in Table 1 must be reported on the required Discharge Monitoring Report (DMR) according to Permit Conditions (S5.B Discharge Monitoring Reports). • If sampling is conducted more frequently than required by this Order, the results of this monitoring must be included in the calculation and reporting of the data that is submitted in the DMR. • Any discharge to Waters of the State in exceedance of the contaminant Indicator Levels in Table 1 must be reported to the Department of Ecology according to Permit Condition S5.F, Noncompliance Notification as follows: o Immediately notify Ecology of noncompliance by calling the regional 24-hour Environmental Report Tracking System (ERTS) phone number (206) 594-0000 (note that this is a new phone number as of 5/17/2021). o Cease the discharge until Indicator Levels can be met. o Submit a detailed, written report to Ecology within five (5) days, unless requested earlier by Ecology. See Permit condition S5.F.3 for the full written report requirements. o For exceedances of the numeric benchmark for pH, refer to Special Condition S4.D.4 of the CSGP.	Skagit County/Contractor	Yes
		• All monitoring data must be prepared by a laboratory registered or accredited under the provisions of Accreditation of Environmental Laboratories, Chapter 137-50 WAC. • All sampling data must be reported monthly on DMRs electronically using Ecology's secure online system WQWebDMR, in accordance to permit condition S5.B. If the measured concentration is below the detection level then Skagit County Public Works must report single analytical values below detection as "less than the detection level (DL)" by entering "<" followed by the numeric value of the detection level (e.g. "<0.1"). All other values above DL must be reported as the numeric value. • Contaminated soils excavated during construction will be immediately hauled offsite without stock piling to an approved disposal facility based on the level of contamination. When it is not feasible to immediately haul soils offsite, the soils must be placed in a covered area to minimize contact with stormwater. • Noncompliance with permit requirements or the provisions of this Order (such as exceedances of indicator levels) must be immediately reported to the Northwest Region Office of the Department of Ecology in accordance with Permit Condition S5.F, Noncompliance Notification. • The Stormwater Pollution Prevention Plan (SWPPP) prepared for March Point (Whitmarsh) Landfill must be fully implemented and amended as needed for the duration of the project. • If a modification of the Order is desired, a written request must be submitted to Ecology and if approved, Ecology will issue an amendment to this Order.		

Summary Table of Permits Requirements

Permit/Approval	General Requirement	Specific Requirement	Responsibility	Reporting Requirement?
Washington Department of Ecology Amended Administrative Order #23530	Revised Indicator Levels and Analytical Methods	Skagit County Public Works must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for monitoring unless the method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136. If Skagit County Public Works uses an alternative method, not specified in the order and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report.	Skagit County	Yes

APPENDIX I

WELL ABANDONMENT WORK PLAN

26 February 2025

Project US0041081

Mr. David Horne
Site Manager and Bay-Wide Coordinator
Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, Washington 98504

Subject: Final Well Abandonment Work Plan
March Point (Whitmarsh) Landfill
Skagit County, Washington

Mr. Horne,

WSP USA Inc. (WSP) has prepared this Draft Well Abandonment Work Plan (work plan) for Skagit County for the March Point (Whitmarsh) Landfill, located at 9633 South March Point Road in Anacortes, Washington (Figure 1). This work plan outlines the abandonment of groundwater monitoring wells and landfill gas (LFG) probes that were installed in 2021 as part of a predesign field investigation. The purpose of the wells and probes abandonment is to prepare the site for remediation.

INTRODUCTION

The design of the Whitmarsh landfill remediation required predesign field investigation. As part of that effort, eight groundwater monitoring wells (MW-21-1 through MW-21-7, MWD-21-1) and three LFG probes (LFGP-21-1 through LFGP-21-3) were installed to obtain more recent information on the landfill groundwater/leachate chemistry, groundwater/leachate levels, LFG levels within the landfill, and the vertical gradient between the lower and the upper aquifers.

The well abandonment information for the previous wells and probes installed during the remedial investigation phase were reviewed and no records of abandonment were found for several wells, LFG probes and one piezometer. Skagit County and WSP representatives located and inspected these wells, probes, and piezometer on 29 January 2025. One former LFG probe, four monitoring wells, and one piezometer were found to be active. Another LFG well could not be located, due to interference from an existing vegetation stockpile. A listing of wells and probes information is presented in the attached Table 1. The locations of the wells and probes are shown on Figure 2, and the installation details are shown on Figure 3. The available boring logs are included as Attachment A.

PROPOSED ACTIVITIES

The existing monitoring wells and probes will be abandoned by a qualified driller, licensed in the State of Wahington. Currently, Holt Drilling, Inc. is identified to perform this work. Abandonments will be in accordance with the State of Wahington's Resource Protection Well Decommissioning standards, Washington Administrative Code 173-160-460.

The proposed method of well abandonment will generate very little noise. The monitoring wells with 2-inch-diameter casings (shallow and deep) will be abandoned by filling them with bentonite chips. The LFG probes with

WSP USA Inc. (WSP)
18300 Redmond Way, Ste 200
Redmond, WA 98052
425-883-0777
wsp.com

1-inch-diameter casings will be abandoned by filling them with bentonite grout to the surface. All monuments will remain in place. No intrusive work will be performed; therefore, no waste is expected to be generated from well abandonment. Should any waste be generated, it will be placed in a 55-gallon drum and stored on site.

During remediation of the site in 2025, the well casings within excavation areas will be cut at the bottom of the excavation as part of the proposed excavation. Well casings within the landfill will be buried under the final engineered cap proposed for the site. Remediation contractor will be required to cut the well casings, not remove them, by the excavator bucket. WSP field representative(s) will verify the operation.

PROPOSED SCHEDULE

The proposed method of well abandonment will generate very little noise and the work is not expected to require more than one day to complete. Therefore, the proposed schedule is to have the driller perform this task during the first week of construction when the remediation contractor mobilizes to the site. At that time, heron noise monitoring will have initiated, while the contractor is setting up. The advantage of this overlapping schedule is that, should the driller have difficulty reaching certain wells, additional construction equipment will be available to assist. Example of potential difficulty could include the truck getting stuck in mud. A letter report will be issued after completion of wells and probes abandonment to summarize the activities, or any observations.

Near the end of construction phase, WSP will prepare a separate work plan for the installation of the long term monitoring wells. If you have any questions or comments, or require additional information, please do not hesitate to contact us.

Sincerely,

WSP USA Inc.

Koorus Tahghighi, PE
Project Manager
Email: koorus.tahghighi@wsp.com

KT/DH:sb:al
x:\us\usxhf100-sea\wordproc_projects\20000s\20441 skagit county\reports\080\final well abandonment wp.docx

Enclosures:	Table 1	Whitmarsh Landfill Well Abandonment
	Figure 1	Site Vicinity Map
	Figure 2	Wells Locations
	Figure 3	Well Installation Details
	Attachment A	Available Boring/Well Installation Logs

Copy S. Edwards/Ecology
A. Hargrove/Ecology
M. Gillaspy/Skagit County
R. Thompson/Skagit County

TABLE

Table 1
Whitmarsh Landfill Well Abandonment
Anacortes, WA
2/4/2025

Well ID[1]	Monument	Total Depth (ft)	Well Depth (ft)	Well Diameter (in)	Latitude		Longitude		Well Tag No.	Lock Present	Needs to be Abandonded or Not?	Notes
					Coordinates	Decimal	Coordinates	Decimal				
LFGP-21-1	Flush	13	13	1	N48° 27' 44.37"	N48.462325 (d)	W122° 31' 45.07"	W122.529186 (d)	BNP 303	--	Needs abandonment	Active hex wrench required to open
LFGP-21-2	Flush	10	10	1	N48° 27' 47.21"	N48.463114 (d)	W122° 31' 49.95"	W122.530542 (d)	BNP 305	--	Needs abandonment	Active hex wrench required to open
LFGP-21-3	Flush	12	12	1	N48° 27' 51.27"	N48.464242 (d)	W122° 31' 53.25"	W122.531460 (d)	BNP 308	--	Needs abandonment	Active hex wrench required to open
MW-03	Aboveground	20.5	20.5	2	N48° 27' 54.29"	N48.465081 (d)	W122° 31' 57.29"	W122.532580 (d)	APE 964	Y	Needs abandonment	Locked and active
MW-05	Aboveground	33	33	2	N48° 27' 46.45"	N48.462903 (d)	W122° 31' 44.97"	W122.529159 (d)	BCP 440	Y	Needs abandonment	Locked and active
MW-06	Aboveground	19.5	19.5	2	N48° 27' 44.73"	N48.462425 (d)	W122° 31' 42.66"	W122.528517 (d)	BCP 441	Y	Needs abandonment	Locked and active
MW-07	Aboveground	19.5	19.5	2	N48° 27' 42.16"	N48.461710 (d)	W122° 31' 40.21"	W122.527837 (d)	BCP 442	Y	Needs abandonment	Locked and active
MW-21-1	Aboveground	19	19	2	N48° 27' 42.75"	N48.461874 (d)	W122° 31' 40.41"	W122.527892 (d)	BNP 334	Y	Needs abandonment	Locked and active
MW-21-2	Aboveground	23	23	2	N48° 27' 46.98"	N48.463049 (d)	W122° 31' 46.80"	W122.529666 (d)	BNP 304	Y	Needs abandonment	Locked and active
MW-21-3	Aboveground	15	15	2	N48° 27' 49.35"	N48.463709 (d)	W122° 31' 50.60"	W122.530723 (d)	BNP 306	Y	Needs abandonment	Locked and active
MW-21-4	Aboveground	20	20	2	N48° 27' 51.36"	N48.464268 (d)	W122° 31' 51.29"	W122.530915 (d)	BNP 307	Y	Needs abandonment	Locked and active
MW-21-5	Aboveground	15	15	2	N48° 27' 54.08"	N48.465021 (d)	W122° 31' 55.51"	W122.532086 (d)	BNP 309	Y	Needs abandonment	Locked and active
MW-21-6	Aboveground	15	15	2	N48° 27' 54.77"	N48.465214 (d)	W122° 31' 57.20"	W122.532556 (d)	BNP 310	Y	Needs abandonment	Locked and active
MW-21-7	Aboveground	15	15	2	N48° 27' 55.09"	N48.465303 (d)	W122° 31' 58.67"	W122.532963 (d)	BNP 311	Y	Needs abandonment	Locked and active
MWD-21-1	Aboveground	45	45	2	N48° 27' 49.04"	N48.463623 (d)	W122° 31' 50.56"	W122.530712 (d)	BNP 302	Y	Needs abandonment	Locked and active
PZ-03	Aboveground	19.5	19.5	2	N48° 27' 40.83"	N48.461341 (d)	W122° 31' 40.99"	W122.528053 (d)	BCP 443	Y	Needs abandonment	Locked and active
LFGP-07	Aboveground	10.5	10.5	1	N48° 27' 41.36"	N48.461489 (d)	W122° 31' 40.52"	W122.527923 (d)	AAF 804	Y	Likely Needs Abandonment	Couldn't break the lock; likely active

Notes:

1. All wells are pvc.

FIGURES



Base map courtesy USGS, WA_Anacortes_South

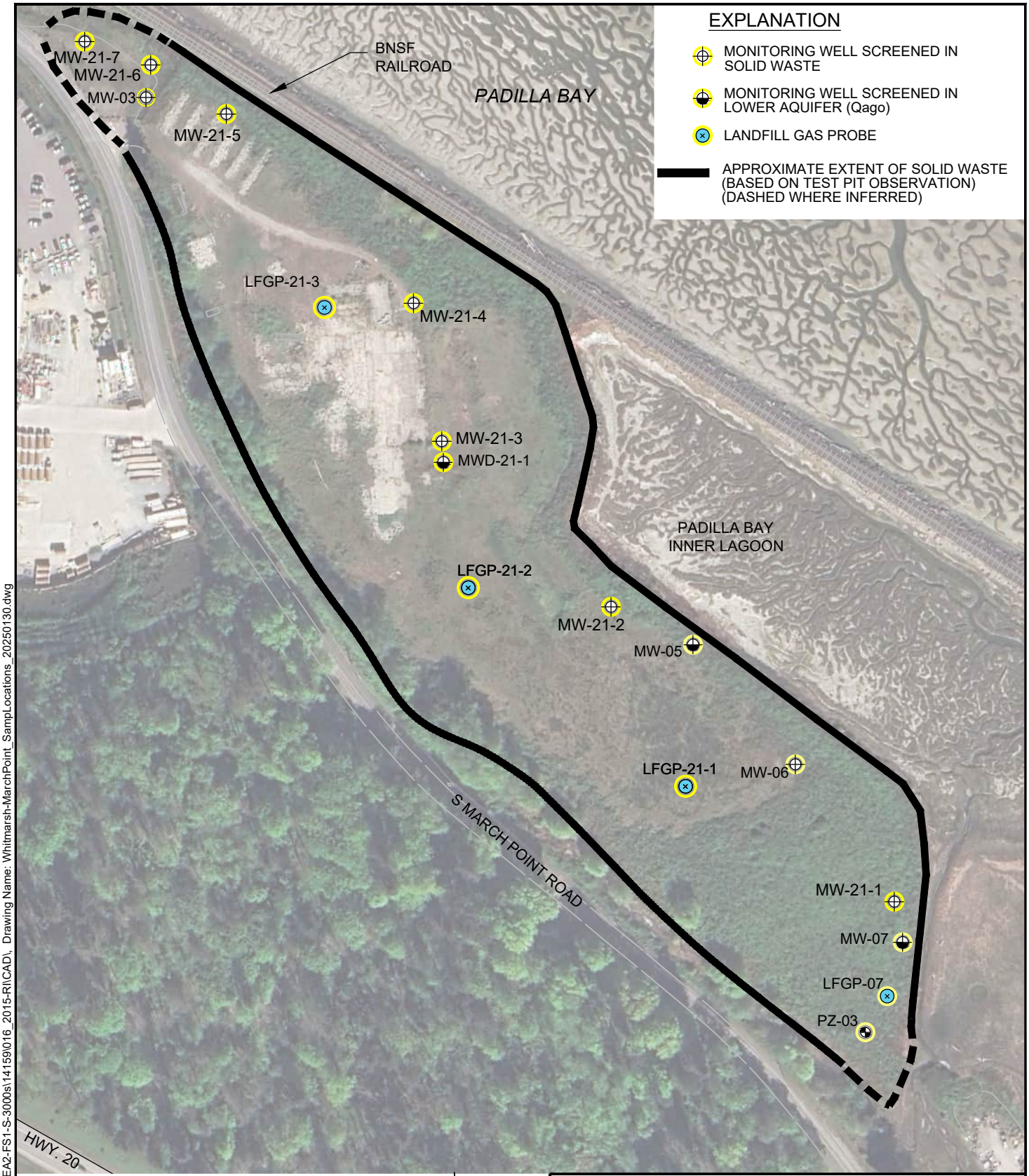
0 1/4 1/2

SCALE: 1" = 1/2 MILE

SITE VICINITY
March Point (Whitmarsh) Landfill
Anacortes, Washington

By: APS	Date: 01/21/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 1

Plot Date: 01/21/25 - 10:25am, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250106.dwg



Aerial Photo Courtesy of Google Earth (April, 2024)

N

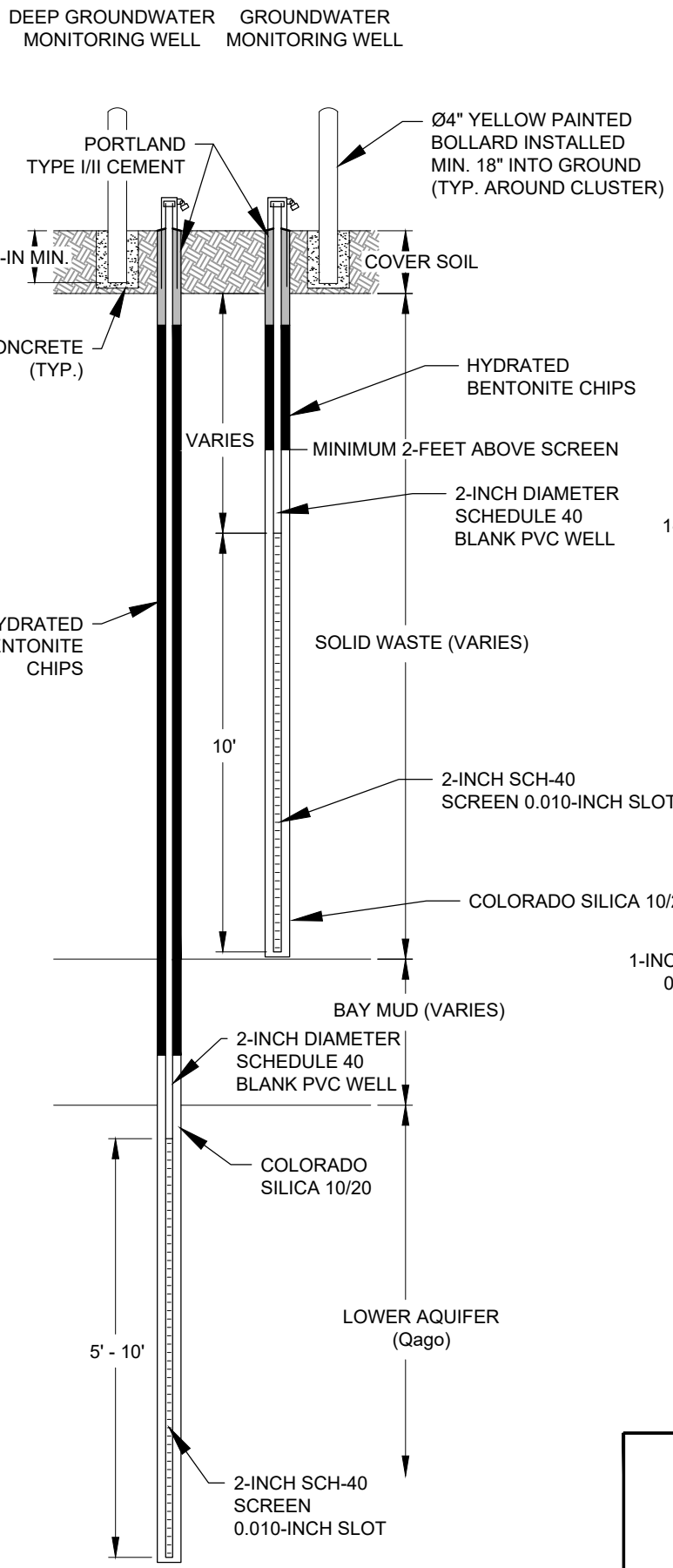
0 100 200

APPROXIMATE SCALE IN FEET

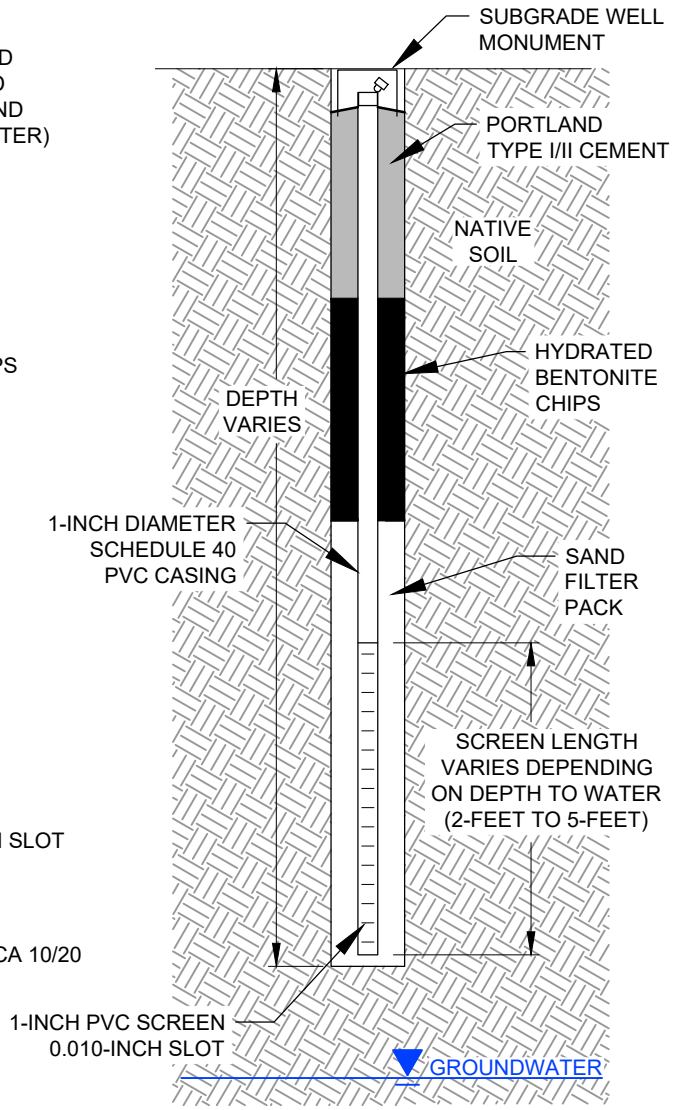
PROPOSED EXPLORATION LOCATIONS
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 02/25/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 2

Plot Date: 02/25/25 - 11:43am, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250130.dwg



1 GROUNDWATER MONITORING WELL CLUSTER



2 LFG PROBE DETAIL

WELL INSTALLATION DETAILS
March Point (Whitmarsh) Landfill
Skagit County, Washington

By: APS	Date: 01/21/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 3

Plot Date: 01/21/25 - 10:28am, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\016_2015-RI\CAD\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250106.dwg

ATTACHMENT A

wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 15.5-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 15"				No hits on LEL, VoCs, etc.
		Sand and trash	3'			
		No cuttings				
5		Bentonite Chips 1 Bag	8'			
			9'			
10		6 bags of 10-20 sand →				
15		2" well screen 10-feet →				
		Water encountered ~16-feet BGS				
			19'			
20		End of Boring at 19-feet.				
		Aboveground monument.				
25						
30						
35						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-2

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 16.9-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 18"				No hits on LEL, VoCs, etc.
		Gray sand, some silt, some trash				
5		Bentonite Chips → 2 Bags				
			8'			
10		Gray sand, some silt, some trash				
		7 bags of 10-20 sand →				
		Water first encountered at 15-feet, but no accumulation. Waited 5 minutes at 21.5-feet +/-				
15		2" screen - 15 feet depth				
20			23'			
		End of Boring at 23-feet.				
25		Aboveground monument.				
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-3

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 19.5-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown Sand - 6"				No hits on LEL, VoCs, etc.
		Gray silty sand; no discernible trash in cuttings	4'			
5			5'			
		Wet FR 7-feet +/-				
		Less silt with depth.				
10		5 bags of 10-20 sand →				
		2" Screen - 10-feet depth				
15			15'			
		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-4

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 25.7-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling -Offset boring 25-feet east **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 6"				No hits on LEL, VoCs, etc.
		Gray-brown sand and gravel - 1.5-feet				
5		Gray-brown gravelly sand, TR silt (rounded gravel)				
			9'			
10			10'			
		Dark gray silty sand Moist - a few pieces of trash				
		6 bags of 10-20 sand →				
15		Water at 14-feet +/-				
		2" Screen - 10-feet depth				
			20'			
20		End of Boring at 20-feet.				
		Aboveground monument.				
25						
30						
35						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-5

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 22.1-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown sand - 1.5-feet				No hits on LEL, VoCs, etc.
		Brown sand, some silt, trace gravel	4'			
5		Gravel 5-feet to 6 -feet hard drilling				
		Brown gray silty sand, some gravel — No bentonite — Grout seal				
10		Brown sand, some silt, moist/wet — 7 bags of 10-20 sand →				
		2" Screen - 10-feet depth	14'			
15		End of Boring at 15-feet.				
		Water rose up to approximately 6-feet BGS, after 5 minutes.				
20		Aboveground monument.				
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-6

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/12/21 **COMPLETED** 10/12/21 **GROUND ELEVATION** 21.4-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand and gravel				No hits on LEL, VoCs, etc.
		Gray silty sand or sand/silt; trash; some sheen noted, some odor				
5		Similar to MW-21-5	5'			
			Sand →			
		Water encountered around 9 to 10 feet				
10		7 bags of 10-20 sand →				
		2" Screen - 10-feet depth				
15			15'			
		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MW-21-7

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/12/21 **COMPLETED** 10/12/21 **GROUND ELEVATION** 21.2-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand and gravel - 1 to 1.5 feet				No hits on LEL, VoCs, etc.
		Gray sand, some silt, trace gravel				
5			5'			
		Water around 9 to 10 feet				
10		Gray sand, some gravel, some silt — 7 bags of 10-20 sand →				
		2" Screen - 10-feet depth				
15			15'			
		End of Boring at 15-feet.				
		Aboveground monument.				
20						
25						
30						
35						

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WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MWD-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/26/21 **COMPLETED** 10/26/21 **GROUND ELEVATION** 19.2-feet MLLW **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Geoprobe 8140 LC **SPT HAMMER EFFICIENCY**

DRILLING METHOD **STATION (FT)** **OFFSET (FT)**

LOGGED BY Cherie Howland **CHECKED BY** **NORTHING** **EASTING**

NOTES BNP 334 Well Tag ID **GW LEVEL (ATD)**

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Medium gray fine-medium sand with debris (glass, wood); moist				No hits on LEL, VoCs, etc.
		dk brown clay moist - 2- to 2.5-feet	100%			
5		Medium gray fine-medium sand, some fine to course gravels moist.				
10		dk gray silty sand, fine to course; some organics & debris, wet	100%			
15		No recovery	100%			
20		dk gray, fine to course, sand with fine to course gravels sat.	0%			
		dk gray clay, some fine sand, wet	100%			
25		Medium gray fine gravels with sand, fine to course, and some course gravels sat.				
30		Medium gray, fine to course, sand, some fine gravel sat.	100%			
		Medium gray, silty sand, some fine gravel sat.	100%			
35						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** MWD-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
35						Screened at 35 to 45-feet within the last 10-feet of the well.
		Medium gray, clayey silty sand, some fine gravel sat.	80%			
40		Medium gray, fine sand, some shells, wet.	80%			
45		End of Boring at 45-feet.				
		Aboveground monument.				
50						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation Anacortes, Washington	**Log of Well No. MW-03**
BORING LOCATION: N: 538979.1; E: 1228187.2	TOP OF CASING ELEVATION AND DATUM: 21.1 feet NAVD 88
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/9/08 / DATE FINISHED: 10/9/08
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.5 / SCREEN INTERVAL (ft.): 5-15
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 6 ft, COMPL. NA / CASING: 2" Sch. 40 PVC
SAMPLING METHOD: Dames & Moore (1.5' x 3.25")	LOGGED BY: N. Bacher
HAMMER WEIGHT: 300 / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bacher / REG. NO. L.G. 2528

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation: 23.76 feet NAVD88	
0					Postholed through roadbase to 4 feet below ground surface.	* OVM = Photovac 2020 calibrated to 100 ppm isobutylene standard
1						Basalite Concrete
2						
3						Medium bentonite chip (Pure Gold) seal
4			17 15 50/6"		SILTY SAND with GRAVEL (SM): brown (10YR 4/3), dry, 70% fine to medium sand, 15% fine subrounded gravel, 15% non-plastic fines, oxidized mottling	
5						Cemex 2/12 Lapis Lustre Sand filter pack
6			1 1 1		wet	
7					wood fragment, black	
8			1 2 3			2" diameter Schedule 40 PVC casing
9			4 2 2		SILTY SAND (SM): black (N 2.5/), wet, 70% medium sand, 20% non-plastic fines, 10% fine gravel, wood fragments, glass decreasing wood content	
10	MW-03-10.5-1008		7 6 18			
11						
12			5 3 2			8.25" diameter bore hole
13						
14						
15			7 9			

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. MW-03 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16			11 5 5 2		SILTY SAND (SM): cont'd. increasing wood content, glass fragments	2" diameter Schedule 40 PVC end cap *10% Wood*
17					wet, 75% fine sand, 25% non-plastic fines	*15% Wood*
18			4 7 7		wet, 50% fine to medium sand, 25% non-plastic fines, 10% fine subrounded gravel	
19			50/6"		LEAN CLAY (CL): dark bluish gray (5B 3/1), wet, 95% non-plastic fines, 5% fine gravel, very stiff	
20					fine sand laminations	
21					Bottom of boring at 20.5 feet.	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKWELLV_TOC (REV. 8/2011)

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation Anacortes, Washington	**Log of Well No. MW-05**
BORING LOCATION: N 538166.5; E 1228999.6	TOP OF CASING ELEVATION AND DATUM: 16.7 feet NAVD 88
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 3/30/10 / DATE FINISHED: 3/30/10
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 33.0 / SCREEN INTERVAL (ft.): 23-33'
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 9.0, COMPL. NA / CASING: 2" Sch. 40 PVC
SAMPLING METHOD: Split-spoon drive sampler [18" x 1.5"]	LOGGED BY: N. Bacher
HAMMER WEIGHT: 300 lb. / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bacher / REG. NO. L.G. 2528

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation: 19.49 feet NAVD 88 TOC	
1			2 2 2		SILTY SAND (SM): brown, moist, 80% fine sand, 20% non-plastic fines, trace wood shreds and bark	Cemex concrete
2			2 5 20			
3					scattered concrete pieces	8.25" borehole
4			10 12 15			
5			12 6 5		REFUSE MATERIAL: SILTY SAND (SM): brown, moist, 80% fine sand, 20% non-plastic fines, trace wood shreds and bark, scattered refuse (plastic, glass)	2" diameter Schedule 40 PVC casing
6						
7			8 9 9		REFUSE MATERIAL: POORLY GRADED SAND with SILT and GRAVEL (SP-SM): brown, moist, 70% fine sand, 20% fine gravel, 10% non-plastic fines, scattered refuse	
8			8 12 19			
9					REFUSE MATERIAL: SILT with SAND (ML): gray, wet, 70% fines, 30% fine sand, low plasticity, soft	
10			50/6			
11			3 3 4		SILT (ML): gray, wet, 90% fines, 10% fine sand, low plasticity, soft	
12						Baroid bentonite chips
13			2 3 3			
14					no sample due to conductor seal	
15						

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. MW-05 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16			7 4 4		Silt (ML): Cont.	Baroid bentonite chips
17			4 4 4			8.25" borehole
18					trace crushed shells	
19			7 8 9			
20			10 12 16		POORLY GRADED SAND with GRAVEL (SP): gray, wet, 70% fine to coarse sand, 25% fine gravel, 5% non-plastic fines	
21						
22			10 12 12			Cemex Lapis Lustre #2/12 filter sand
23			11 10 12			
24						
25			10 12 17			
26					lenses of increased fine gravel	
27			10 14 18			
28			10 17 18			2" diameter Schedule 40 PVC (0.010-inch slot size) screen
29						
30			10 14 15			
31			20 26 30		10% fine gravel	
32			17 26 30		60% gravel	2" diameter Schedule 40
33						

OAKWELLV_TOC (REV. 8/2011)

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. MW-05 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Bottom of boring at 33.0 feet.	PVC endcap
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						
49						
50						
51						

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation Anacortes, Washington	**Log of Well No. MW-06**
BORING LOCATION: N 537988.5; E 1229151.3	TOP OF CASING ELEVATION AND DATUM: 15.3 feet NAVD 88
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 3/30/10 / DATE FINISHED: 3/30/10
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 19.5 / SCREEN INTERVAL (ft.): 4.5-9.5'
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 8.0, COMPL. NA / CASING: 2" Sch. 40 PVC
SAMPLING METHOD: Split-spoon drive sampler [18" x 1.5"]	LOGGED BY: N. Bacher
HAMMER WEIGHT: 300 lb. / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bacher / REG. NO. L.G. 2528

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
					Surface Elevation: 18.03 feet NAVD 88 TOC	
1			7 7 8		SILTY SAND (SM): brown moist, 80% fine sand, 20% non-plastic fines, scattered wood pieces	Cemex concrete
2			11 10 15		REFUSE MATERIAL: SILTY SAND (SM): brown, moist, 70% fine sand, 30% non-plastic fines, scattered wood pieces, scattered refuse (plastic)	2" diameter Schedule 40 PVC casing 8.25" borehole
3						Baroid bentonite chips
4			7 8 8		REFUSE MATERIAL: SILT with SAND (ML): very dark gray, moist, 70% fines, 30% fine sand, low plasticity, refuse (glass, wood, plastic)	
5			3 6 3			
6						
7			13 22 50			2" diameter Schedule 40 PVC (0.010-inch slot size) screen
8			32 50/4		black wet	
9					REFUSE MATERIAL: SILTY SAND (SM): very dark gray, wet, 70% fine sand, 30% non-plastic fines, scattered wood pieces, refuse (glass, plastic)	
10			2 4 10		ELASTIC SILT (MH): gray, wet, 100% fines, medium plasticity, soft	2" diameter Schedule 40 PVC endcap Cemex Lapis Lustre #2/12 filter sand
11			10 12 15		WELL GRADED SAND with SILT (SW-SM): gray, wet, 80% fine to coarse sand, 10% non-plastic fines, 10% fine gravel	
12						Baroid bentonite chips
13			8 12 13			
14			7 8 10			
15						

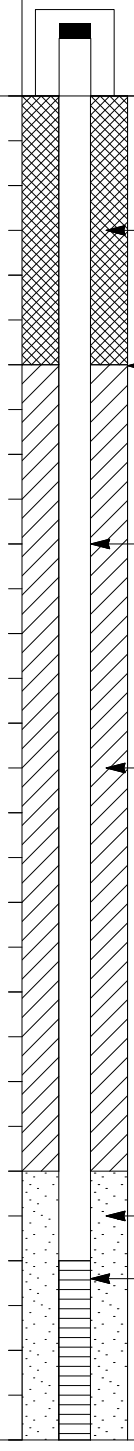
PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. MW-06 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16			8 10 11		WELL GRADED SAND with SILT (SW-SM): Cont.	Baroid bentonite chips
17			8 10 10			8.25" borehole
18						
19			8 10 12		Bottom of boring at 19.5 feet.	
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation Anacortes, Washington	**Log of Well No. MW-07**
BORING LOCATION: N 537724.2; E 1229310.9	TOP OF CASING ELEVATION AND DATUM: 15.1 feet NAVD 88
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 3/31/10 / DATE FINISHED: 3/31/10
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 19.5 / SCREEN INTERVAL (ft.): 13-18'
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 8.0, COMPL. NA / CASING: 2" Sch. 40 PVC
SAMPLING METHOD: Split-spoon drive sampler [18" x 1.5"]	LOGGED BY: N. Bacher
HAMMER WEIGHT: 300 lb. / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bacher / REG. NO. L.G. 2528

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: 17.89 feet NAVD 88 TOC
1			2 3 3		SILTY SAND (SM): gray, moist, 60% medium sand, 20% low plasticity fines, 20% wood debris (roots)
2			3 24 40		5% wood debris
3					
4			3 4 5		
5			2 4 4		REFUSE MATERIAL: SILTY SAND (SM): gray, moist, 80% medium sand, 20% low plasticity fines, white plastic refuse 10% gravel to 1"
6					
7			4 5 5		
8			2 2 3		wet
9					scattered gravel
10			2 3 3		
11			5 6 7		
12					
13			10 12 14		WELL GRADED SAND (SW): gray, wet, 80% fine to coarse sand, 15% fine gravel rounded, 5% non-plastic fines, trace brown wood chunks
14			7 11 13		no wood chunks
15					

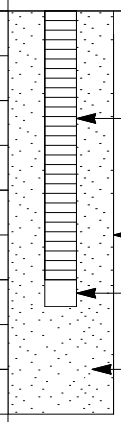


WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. MW-07 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16			10 23 28		WELL GRADED SAND (SW): Cont.	
17			8 22 24			
18						
19			15 19 24			
					Bottom of boring at 19.5 feet.	
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						



wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-1

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 15.1-feet **HOLE SIZE** 4"+ 10

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Sand - 8"				No hits on LEL
		Silty sand and trash	2'			
		2-feet solid riser				
		1" screen at 5-feet				
5		10-20 sand 2 bags	7'			
10		Water encountered at 12-feet +/- Then rose up boring pit ~6.5-feet BGS				
		End of Boring at 13-feet. Terminated due to water level.				
15		Flush monument.				
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-2

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** 18.3-feet **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY**

DRILLING METHOD HSA 8" +/- **STATION (FT)** **OFFSET (FT)**

LOGGED BY Koorus Tahghighi **CHECKED BY** **NORTHING** **EASTING**

NOTES No Sampling **GW LEVEL (ATD)**

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown Sand - 18"	2'			No hits on LEL
		Gray silty sand 1" screen at 5-feet				
5		Encountered cobbles (>) from 4-feet to 6-feet 10-20 sand 5 bags	7'			
		Cuttings moist - no static water				
10		Down to 10-feet				
		End of Boring at 10-feet.				
		Flush monument.				
15						
20						
25						
30						
35						

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wood.

PROJECT NAME Whitmarsh Landfill **PROJECT NUMBER** PS21204410 **BORING NUMBER** LFGP-21-3

CLIENT Skagit County **PROJECT LOCATION** Anacortes, WA

DATE STARTED 10/11/21 **COMPLETED** 10/11/21 **GROUND ELEVATION** _____ **HOLE SIZE** 4"+/-

DRILLING CONTRACTOR Holocene **DRILL RIG** Dietrich D-50 Track Mounted **SPT HAMMER EFFICIENCY** _____

DRILLING METHOD HSA 8" +/- **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY Koorus Tahghighi **CHECKED BY** _____ **NORTHING** _____ **EASTING** _____

NOTES No Sampling **GW LEVEL (ATD)** _____

ELEVATION (ft) / DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0		COVER SOIL: Brown-gray sand & gravel - 1-foot				No hits on LEL
		Gray sand - some silt				
		Trace gravel	4'			
5		1" screen at 5-feet 10-20 sand bags →				
		Water ~10.8-feet to 11-feet	9'			
10		Gray silty sand - moist				
		End of Boring at 12-feet.				
15		Flush monument.				
20						
25						
30						
35						

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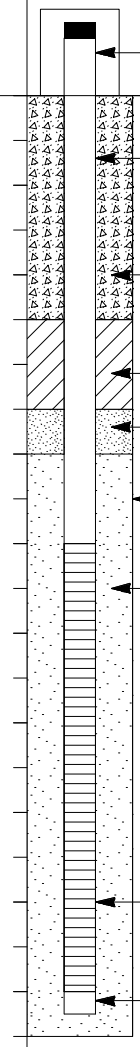
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PROJECT: LFG Installation 2011
Whitmarsh Landfill

Log of Well No. LFGP-07

BORING LOCATION: 537643.9 N, 1229287.9 E	GROUND SURFACE ELEVATION AND DATUM: 16.32 (TOC), NAVD 88		
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 9/27/11		DATE FINISHED: 9/27/11
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 10.5		SCREEN INTERVAL (ft.): 5-10'
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER:	FIRST 10 / COMPL. NA	CASING: 1" Sch. 20 PVC
SAMPLING METHOD: Split-spoon drive sampler [18" x 1.5"]	LOGGED BY: D. O'Reilly		
HAMMER WEIGHT: 300 lbs. / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bachér		REG. NO. LG 2528

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION (NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.)
					Surface Elevation: 16.32 (TOC), NAVD 88
0			5 8 17		automotive debris, metal, tires, chains
1			Overdriven		POORLY GRADED SAND with SILT (SP-SM): brown (7.5YR 5/4), dry, 90% fine sand, 10% non-plastic fines, anthropogenic waste (glass, metal fragments)
2					
3			2 2 2		
4			10 12 11		
5				14.2	POORLY GRADED SAND (SP): dark brown (7.5YR 3/3), moist, 100% fine-medium sand, wood/ anthropogenic debris (glass, plastic)
6	LFGP-07-7-0911		1 1 2	15.7	SILT (ML): brown (7.5YR 4/3), moist, 90% moderate plasticity fines, 10% fine sand
7			1 1 2	0.0	POORLY GRADED SAND (SP): very dark gray (7.5YR 3/1), moist, 100% medium sand, wood fragments, rounded lithic grains
8					
9			2 3 5		
10					wet
11					Bottom of boring at 10.5'. WSDOE well tag= AAF 804.
12					
13					
14					
15					



WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS

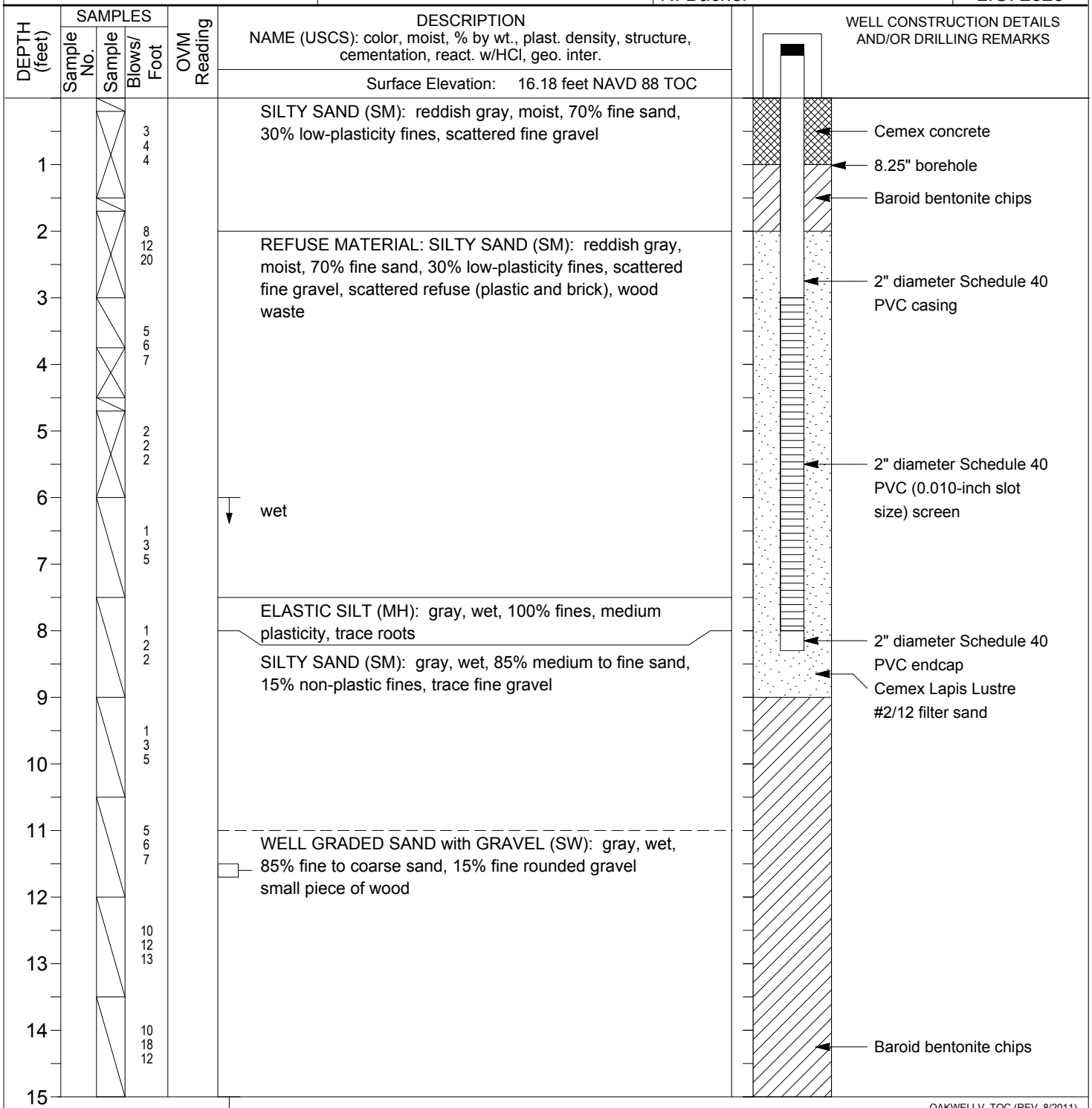
- 30" PVC stickup in locking casing.
- 1" diameter Schedule 20 PVC casing
- Readymix concrete
- Setco 3/8" medium bentonite chips
- 2/12 Lapis Lustre sand
- 8.5" diameter bore hole
- Sakrete All-Purpose Gravel
- Schedule 20 PVC well screen with 1" diameter and 0.010 slot
- 1" Schedule 20 PVC end cap

* OVM = Photovac 2020 calibrated to 100 ppm isobutylene standard

* LFGP-07-7-0911 (1x4 oz jar) collected for moisture content analysis.

OAKWELLV (REV. 8/2011)

PROJECT: Skagit Whitmarsh Landfill Phase II Investigation Anacortes, Washington	**Log of Well No. PZ-03**
BORING LOCATION: N 537590.4; E 1229255.4	TOP OF CASING ELEVATION AND DATUM: 12.8 feet NAVD 88
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 3/31/10 / DATE FINISHED: 3/31/10
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 19.5 / SCREEN INTERVAL (ft.): 3-8'
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 6.0, COMPL. NA / CASING: 2" Sch. 40 PVC
SAMPLING METHOD: Split-spoon drive sampler [18" x 1.5"]	LOGGED BY: N. Bacher
HAMMER WEIGHT: 300 lb. / DROP: 30"	RESPONSIBLE PROFESSIONAL: N. Bacher / REG. NO. L.G. 2528



PROJECT: Skagit Whitmarsh Landfill Phase II Investigation
Anacortes, Washington

Log of Well No. PZ-03 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16			12 22 30		20% fine rounded gravel WELL GRADED SAND with GRAVEL (SW): Cont.	Baroid bentonite chips 8.25" borehole
17			15 23 26			
18						
19			15 19 27		Bottom of boring at 19.5 feet.	
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

APPENDIX J

IMPORT MATERIAL CHARACTERIZATION REPORT

FINAL IMPORT MATERIAL CHARACTERIZATION REPORT

WHITMARSH LANDFILL REMEDIATION
ANACORTES, WASHINGTON
PROJECT US0041081.0037

Prepared for:

SKAGIT COUNTY

1800 Continental Place, Mount Vernon, Washington 98273

APRIL 30, 2025

FINAL IMPORT MATERIAL CHARACTERIZATION REPORT

WHITMARSH LANDFILL REMEDIATION
ANACORTES, WASHINGTON
PROJECT US0041081.0037

Prepared for:

Skagit County
1800 Continental Place, Mount Vernon, Washington 98273

Prepared by:

WSP USA Inc.
18300 Redmond Way, Ste 200
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USA
T: 425-883-0777

April 30, 2025

TABLE OF CONTENTS

1 Introduction 1
2 Sample Collection/Analysis 1
2.1 Backfill for Sand Drains/Common Borrow 2
2.2 Type A Topsoil and Compost 2
3 Quality Assurance/Quality Control 2
3.1 Semivolatile Analysis 3
3.2 Semivolatile SIM Analysis 3
3.3 Polychlorinated Biphenyl Analysis 3
3.4 Gasoline Range Hydrocarbon Analysis 3
3.5 Diesel Range Hydrocarbon Analysis 3
3.6 Dioxin/Furan Analysis 3
3.7 ICPMS Metals Analysis 4
3.8 Mercury Analysis 4
3.9 Total Organic Carbon Analysis 4
4 Results 4
4.1 Backfill for Sand Drains/Common Borrow 4
4.2 Type A Topsoil 4
4.3 Compost 5
5 Recommendations 5
6 References 5

LIST OF TABLES

Table 1 Chemicals of Concern Concentrations and Screening Criteria
Table 2 Soil Health Parameter Sample Results from Soiltest Farm Consultants, Inc.
Table 3 Geotechnical Sample Results from Materials Testing and Consulting, Inc.

APPENDIX

Appendix A Laboratory Test Reports
Appendix B Data Validation Report

LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	microgram per kilogram
COC	chemical of concern
dw	dry weight
Ecology	Washington Department of Ecology
Granite	Granite Construction
Miles	Miles Sand and Gravel
ng/kg	nanograms per kilogram
PQL	practical quantitation limit
TEQ	toxic equivalent quotient
TOC	total organic carbon
Work Plan	Import Material Characterization Work Plan
WSP	WSP USA Inc.

1 INTRODUCTION

WSP USA Inc. (WSP) prepared this report on behalf of Skagit County for the Whitmarsh Landfill Remediation project. The Washington Department of Ecology (Ecology) requested that some of the fill types be tested for chemicals of concern (COCs) prior to placement at the site. To reduce the time burden on the selected construction contractor, Skagit County requested identification and characterization of potential sources of fill prior to contractor selection. The goal of this work is to identify Ecology preapproved sources of fill that the construction contractor can use at the landfill without causing potential delays.

Construction of the remedial action will require the import of fill material for cap construction. Import material includes the following Washington Department of Transportation fill types:

- Sand-Backfill for Sand Drains;
- Crushed Rock-Select borrow, Crushed Surfacing Top Course, Ballast Surfacing Area;
- Cover Soil-Common borrow, Option 2;
- Topsoil-Type A topsoil (topsoil); and
- Compost

Ecology stipulated that crushed rock did not need to be characterized chemically due to its grain size; however, other material does need to be characterized for COCs. Ecology also stipulated that topsoil and compost cannot be derived from municipal recycling but must come from a "virgin" source. The topsoil, compost, and sand that will be placed below the high tide line (sand) must meet the chemical criteria identified in Table 1 for marine cleanup levels; once approved, the source will not need to be tested again. The cover soil placed above the high tide line must meet the Model Toxics Control Act Method A cleanup levels for Unrestricted Use, also shown in Table 1, and will need to be tested just prior to its import. WSP proposed to identify and characterize several sources of cover soil to make sure acceptable sources will be available; then during construction the actual material will be tested for verification.

In August 2024, Skagit County submitted to Ecology the Import Material Characterization Work Plan (Work Plan) (WSP 2024) for review and approval. Ecology approved the plan on August 27, 2024.

2 SAMPLE COLLECTION/ANALYSIS

The sampling procedure followed the process identified in the Work Plan. Three composite samples were collected from each potential source for chemical analysis. Each composite sample comprised five, equal-volume discrete samples. No two discrete samples were collected from the same location. Field staff collected samples using pre-cleaned stainless-steel spoons dedicated to each composite sample. To ensure an equal volume of material was collected for each discrete sample, the material was placed in a 15-ounce pre-cleaned measuring cup and put into a pre-cleaned stainless-steel bowl to homogenize the sample. Samples were placed on ice and transported or shipped to the laboratory under chain of custody protocols. Samples collected for chemical analysis were delivered to Analytical Resources, LLC, for chemical analysis.

Additionally, two 1-gallon composite samples were collected for soil health or geotechnical parameters testing. The 1-gallon compost samples comprised five equal-volume subsamples collected at discrete locations. Samples collected for soil health and geotechnical parameters testing were delivered to Materials Testing and Consulting, Inc. in Burlington, Washington, and the samples collected for soil health testing were shipped to SoilTest Farm Consultants, Inc. in Moses Lake, Washington, under chain of custody protocols. The summary of all the laboratory testing are presented on Tables 1 through 3. The laboratory test reports are included in Appendix A.

Each sample collected was analyzed for the Sediment Management Standards, Marine Sediment Cleanup Objectives COCs (as defined in Washington Administrative Code 173-204-562) or other criteria, as shown in Table 1. In addition, the laboratories analyzed selected samples for dioxins/furans and total petroleum hydrocarbons, as requested by Ecology. Nonionizable organic Marine Sediment COC concentrations are carbon normalized for

comparison to the Sediment Cleanup Objectives when the total organic carbon (TOC) in sediment is in the range of 0.5 to 3.5 percent. Outside of this TOC range, carbon normalization of the nonionizable COCs may not be appropriate. All TOC concentrations in sediment were less than 0.5 percent or greater than 3.5 percent (see Table 1); therefore, the dry-weight (dw) concentrations were used for all criteria comparisons (see Table 1).

The suitability of fill material is based on the following:

1. The lowest risk-based concentration (i.e., concentrations protective of benthic invertebrates, upper-trophic-level species, and human health).
2. Natural background.
3. Practical quantitation limit (PQL) values (shown in Table 1).

Site-specific, risk-based concentrations that are protective of human health or the health of upper-trophic-level species have not been developed for this site; therefore, the fill material criterion for bioaccumulative contaminants will default to the highest of (1) natural background or (2) PQL.

2.1 BACKFILL FOR SAND DRAINS/COMMON BORROW

WSP identified two vendors for the backfill for sand drains (sand) and common borrow (cover soil): Granite Construction (Granite) in Conway, Washington, and Miles Sand and Gravel (Miles) in Oak Harbor, Washington. Neither Granite nor Miles had the backfill drain sand at their facilities. Both vendors indicated that the backfill for sand drains derives from the same pits and material as the cover soil, except that it is sieved to provide the required grain-size distribution for the backfill for sand drains. Therefore, only the common borrow was analyzed and was assumed to represent the sand that would be sieved from the cover soil material. Analysis of the cover soil included all analytes for both the sand and cover soil (Table 1). Cover soil will be tested again by the contractor for the total petroleum hydrocarbons and Resource Conservation and Recovery Act metals prior to import to the site.

The cover soil was also tested for the geotechnical properties as shown in Table 3.

2.2 TYPE A TOPSOIL AND COMPOST

To reduce the potential of contaminants being present in topsoil or compost above concentrations of concern, Ecology required that topsoil and compost must come from a virgin source. A virgin source would be from a feedstock that would not be expected to contain anthropogenically generated chemical contamination (e.g., organic material derived from rural land clearing). Two local vendors were identified that could provide material from these sources: Growsource in Bellingham, Washington and Sunland Bark and Topsoil in Anacortes, Washington. Topsoil and compost samples from each vendor were analyzed for the COCs shown in Table 1. Topsoil was also tested by an agronomy laboratory, as shown in Table 2, to determine the suitability of the material for supporting plant growth.

3 QUALITY ASSURANCE/QUALITY CONTROL

An independent validator, Ms. Cari Sayler of Sayler Data Solutions, conducted a data quality review. The validation process followed the requirements as specified in the Work Plan. Results were evaluated based on criteria from the analytical methods, project documents, and current U.S. Environmental Protection Agency guidance documents. Ms. Saylor performed a stage 4 validation on the dioxin/furan analysis and a stage 2B validation on the remaining analyses. The full data validation report is provided in Appendix B. A summary of the validation is below.

3.1 SEMIVOLATILE ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Estimated qualifiers were assigned based on high or low calibration verification and/or reporting limit standard recoveries. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes, with estimated qualifiers added based on high surrogate or low internal standard recoveries. Semivolatile data are acceptable for use as qualified.

3.2 SEMIVOLATILE SIM ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Estimated qualifiers were assigned based on high or low calibration verification recoveries. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes, with estimated qualifiers added based on low matrix spike and low internal standard recoveries. Additional qualifiers were assigned based on laboratory blank contamination. Semivolatile SIM data are acceptable for use as qualified.

3.3 POLYCHLORINATED BIPHENYL ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. Polychlorinated biphenyl data are acceptable for use as reported.

3.4 GASOLINE RANGE HYDROCARBON ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. Gas data are acceptable for use as reported.

3.5 DIESEL RANGE HYDROCARBON ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. Diesel data are acceptable for use as reported.

3.6 DIOXIN/FURAN ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes. Qualifiers were added for a high calibration verification recovery, lab blank contamination, and lab duplicate variability. Additional qualifiers were added based on chlorinated diphenyl ether interferences and EPA Region 10 guidelines on treatment of EMPCs. Dioxin/furan data are acceptable for use as qualified.

3.7 ICPMS METALS ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Laboratory quality control results demonstrate acceptable levels of accuracy and precision for most analytes. Qualifiers were added to arsenic and lead results for high lab duplicate variability. ICPMS metals data are acceptable for use as qualified.

3.8 MERCURY ANALYSIS

Documentation was found to be clear and complete. Instrument banks showed instrument drift at levels allowed by the method, however seven low concentration results and all non-detect results were qualified as estimated. Remaining calibration results demonstrate acceptable instrument performance. Laboratory quality control results demonstrate acceptable levels of accuracy and precision. Mercury data are acceptable for use as qualified.

3.9 TOTAL ORGANIC CARBON ANALYSIS

Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Some analysis dates did not meet the Quality Assurance Project Plan's target holding times, and replicate analysis indicated variability. All sample results were qualified as estimated. TOC data are acceptable for use as qualified.

4 RESULTS

This section presents the results of the analysis of samples collected from potential import material sources. The results of the chemical analysis are presented in Table 1.

4.1 BACKFILL FOR SAND DRAINS/COMMON BORROW

There were no detected exceedances of the screening criteria for the backfill for sand drains/common borrow material from either of the sources tested. Around 89 percent of the chemical analytes were not detected in the sand/common borrow material.

4.2 TYPE A TOPSOIL

There were no detected exceedances of the screening criteria for the topsoil from Growsource; about 81 percent of the chemical analytes were not detected.

About 75 percent of the chemical analytes were not detected in topsoil from Sunland Bark and Topsoil; however, in one of the three samples collected from the topsoil stockpile, the dioxin/furan screening criteria were exceeded. The toxicity equivalent quotient (TEQ) in the sample ranged from 6.50 to 8.46 nanograms per kilogram (ng/kg) TEQ as compared to the screening criteria of 5 ng/kg TEQ. The average of the three samples ranged from 3.35 to 4.71 ng/kg TEQ, which is below the screening criteria. Pyrene exceeded the screening criteria of 5 micrograms per kilogram (µg/kg) dry weight (dw) in all topsoil samples from Sunland Bark and Topsoil (10.3 to 27 µg/kg dw) with an average of about 21 µg/kg dw.

4.3 COMPOST

Approximately 81 percent of the screening analytes were not detected in the compost from Growsource; however, one of the three samples collected from the compost stockpile exceeded the screening criterion for pyrene (20.5 µg/kg dw); pyrene was not detected in the other two samples. No other analyte had a detection that exceeded the screening criteria.

Just under 74 percent of the screening analytes were not detected in compost sample from Sunland Bark and Topsoil. One of the three samples had a slight exceedance (0.85 mg/kg dw) of the screening criterion for cadmium (0.8 mg/kg dw). The average of the cadmium concentration in the three samples was 0.49 mg/kg dw, which is well below the screening criterion. Pyrene exceeded the screening criterion (5 µg/kg dw) in all three of the topsoil samples from Sunland Bark and Topsoil; the concentrations ranged from 27.1 to 39.8 µg/kg dw. The average dioxin/furan TEQ for the Sunland Bark and Topsoil samples ranged from 4.98 ng/kg TEQ (less than the screening criterion of 5 ng/kg TEQ) to 6.39 ng/kg TEQ.

5 RECOMMENDATIONS

The sand/common borrow material at both potential supplier's pits had no exceedances of the screening criteria; therefore, both Granite and Miles are acceptable vendors for the sand and cover soil.

There were few exceedances of the screening criteria for the tested topsoil and compost material. The analytes for which there were exceedances of the screening criteria were cadmium, pyrene, and dioxins/furans. The one sample that exceeded the cadmium screening criterion was the compost from Sundland Bark and Topsoil. The exceedance (0.85 mg/kg dw) was just over the criterion (0.8 mg/kg dw); however, the average of the three samples was well under the screening criterion.

Although there were some exceedances of the screening criteria for both pyrene and dioxins/furans, the screening criteria were based on the PQL. The PQLs do not represent a specific environmental or human health risk, and when used as a screening tool, can be overly conservative. For example, the PQL for pyrene is 5 µg/kg dw while the apparent effects threshold is 2,600 µg/kg dw.

Both Growsource and Sunland can be used as a source for the topsoil and compost.

6 REFERENCES

AMEC Geomatrix, Inc. (AMEC Geomatrix). 2008. *Sediment Investigation Work Plan.* March Point (Whitmarsh Landfill), Anacortes, Washington. Prepared for Skagit County Public Works, Mount Vernon, WA. July.

Washington Department of Ecology (Ecology). 2021. *Sediment Cleanup User's Manual (SCUM). Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204 WAC.* Prepared by Toxics Cleanup Program, Washington State Department of Ecology, Olympia, Washington. Publication No. 12-09-057. December.

WSP USA Environment & Infrastructure Inc. (WSP). 2024. Import Material Characterization Work Plan. Whitmarsh Landfill Remediation, Anacortes, Washington. Prepared for Skagit County Public Works, Mount Vernon, Washington. September.

TABLES

Table 1: Chemicals of Concern Concentrations and Screening Criteria
Whitmarsh Landfill Remediation, Anacortes, Washington

Analyte	Screening Criteria		Growsource																Sunland Bark & Topsoil												Granite						Miles Sand & Gravel					
			Type A Topsoil						Compost										Type A Topsoil						Compost								Common Borrow						Common Borrow					
			20240911-GS-TAT-XX-1		20240911-GS-TAT-XX-2		20240911-GS-TAT-XX-3		20240911-GS-C-XX-1		20240911-GS-C-XX-2		20240911-GS-C-XX-3						20240911-SBT-TAT-XX-1		20240911-SBT-TAT-XX-2		20240911-SBT-TAT-XX-3		20240911-SBT-C-XX-1		20240911-SBT-C-XX-2		20240911-SBT-C-XX-3				20240911-G-CB-XX-1		20240911-G-CB-XX-2		20240911-G-CB-XX-3		20240911-MSG-CB-XX-1		20240911-MSG-CB-XX-2		20240911-MSG-CB-XX-3	
	Marine Sediment Quality Standards	AETs Marine Sediment Cleanup Objective (SCO) [1]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]					Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	MTCA Method A		Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]
Conventionals		**Percent**																																									
Total Organic Carbon	NA	NA	11.6	J	9.58	J	11.8	J	26.6	J	34.3	J	28.6	J					6.62	J	9.15	J	6.76	J	29.7	J	43.4	J	40	J		0.06	J	0.05	J	0.17	J	0.11	J	0.07	J	0.06	J
Metals	**mg/kg dw**	**mg/kg dw**																																									
Arsenic	11 [3]	11 [3]	3.35	J	4.89	J	3.53	J	1.51	J	1.7	J	2.64	J					2.65	J	2.58	J	2.77	J	1.43	J	1.32	J	1.55	J	20	2.67	J	3.43	J	9.48	J	3.78	J	2.5	J	2.39	J
Cadmium	0.8 [3]	0.8 [3]	0.18		0.2		0.17		0.13	J	0.17	J	0.17	J					0.13	J	0.2		0.12	J	0.31		0.32		0.85		2	0.13		0.09	J	0.08	J	0.1		0.08	J	0.09	J
Chromium	260 [3]	260 [3]	14.9	D	16.2	D	13.9	D	9.3		8.9		14.1						22.6	D	19.1	D	24.7	D	10.5		12.1		11.4		2000	196	D	126	D	142	D	19.0	D	20.7	D	19.7	D
Copper	390 [3]	390 [3]	32.8		35.7		36.5		35.8		43.5		44.4						21.1		20.9		21		31		30.2		32.6			31.9		29.4		30.9		21.5		21.5		25.9	
Lead	21 [3]	21 [3]	3.2	J	3.71	J	3.26	J	1.37	J	1.56	J	1.89	J					3.59	J	3.63	J	3.91	J	3.11	J	2.84	J	3.05	J	250	2.41	J	1.86	J	2	J	2.94	J	2.67	J	2.19	J
Mercury	0.2 [3]	0.2 [3]	0.0666		0.0183	J	0.0256	J	0.0426	UJ	0.0438	UJ	0.0516	UJ					0.0207	J	0.0431		0.0217	J	0.0626	UJ	0.0091	J	0.0389	UJ	2	0.0549		0.0520		0.0458		0.0238	UJ	0.0106	J	0.00649	J
Silver	6.1	6.1	0.09	J	0.1	J	0.1	J	0.05	J	0.07	J	0.08	J					0.07	J	0.08	J	0.07	J	0.06	J	0.07	J	0.08	J		0.06	J	0.04	J	0.04	J	0.08	J	0.05	J	0.05	J
Zinc	410	410	82		91.3		84.5		106		128		135						55.5		62.9		60		158		167		219			50.7		36.6		43.4		41.4		37.3		37.7	
Organic and Chlorinated Organic Chemicals	**µg/kg dw**	**µg/kg dw**																																									
2,4-Dimethylphenol	29	29	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ					20	UJ	19.9	UJ	19.9	UJ	20	UJ	20	UJ	20	UJ		20	UJ	20	UJ	19.9	UJ	20	UJ	19.8	UJ	20	UJ
2-Methylphenol	63	63	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	7.5		5	U		5	U	5	U	5	U	5	U	5	U	5	U
4-Methylphenol	670	670	17.5		18.1		21.1		12.1		10.7		8.9						31.3		52.5		29.9		112		80		190			5	U	5	U	5	U	5	U	5	U	5	U
Benzoic acid	650	650	200	UJ	99.9	UJ	99.9	UJ	99.8	UJ	99.9	UJ	99.9	UJ					99.9	UJ	99.5	U	99.7	U	99.8	UJ	100	UJ	99.8	UJ		99.8	U	99.2	U	100	UJ	99.9	U	100	U	99.7	U
Benzyl alcohol	57	57	20	U	20	U	20	U	20	U	20	U	20	U					20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	UJ	20	UJ	19.9	UJ
Pentachlorophenol	355 [4]	355 [4]	11.7	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ					20	UJ	11.4	UJ	19.9	UJ	20	UJ	20	UJ	20	UJ		20	UJ	19.8	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ
Phenol	420	420	10.5		5		5.8		7.7		6.4		5	J					5.2		5.4		4.4	J	33.9		22		41.9			5	U	5	U	5	U	5	U	5	U	5	U
Organic and Chlorinated Organic Chemicals	**mg/kg OC**	**µg/kg dw**																																								
1,2,4-Trichlorobenzene	0.81	31	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	5	U	5	U		5	U	5	U	5	U	5	U	5	U	5	U
1,2-Dichlorobenzene	2.3	35	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	5	U	5	U		5	U	5	U	5	U	5	U	5	U	5	U
1,4-Dichlorobenzene	3.1	110	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	5	U	5	U		5	U	5	U	5	U	5	U	5	U	5	U
Dibenzofuran	15	540	20	U	20	U	20	U	20	U	20	U	20	U					20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Hexachlorobenzene	0.38	22	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	UJ	5	U	5	U	5	U		5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Hexachlorobutadiene	3.9	11	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	5	U	5	U		5	U	5	U	5	U	5	U	5	U	5	U
N-nitrosodiphenylamine	11	28	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ					5	UJ	5	UJ	5	U	5	UJ	5	UJ	5	UJ		5	U	5	U	5	U	5	U	5	U	5	U
Phthalates	**mg/kg OC**	**µg/kg dw**																																								
Bis(2-Ethylhexyl)phthalate	47	1300	49.9	U	49.9	U	50	U	49.9	U	50	U	52.3	J					129	J	103	J	44	J	346	J	428	J	481	J		49.9	U	49.6	U	50	U	50	U	50	U	54.9	
Butylbenzyl phthalate	4.9	63	20	U	20	U	20	U	20	U	20	U	20	U					5	UJ	5	UJ	5	U	12.4	J	5	UJ	15.1	J		5	U	5	U	5	U	5	U	5	U	5	U
Diethyl phthalate	61	200	11.9	UJ	10.4	UJ	20	U	24.7	UJ	15	UJ	20	U					20	U	19.9	U	19.9	U	20	U	20	U	20	U		16.2	UJ	10.7	UJ	20	U	10.5	UJ	11.2	UJ	10.2	UJ
Dimethyl phthalate	53	71	5	U	5	U	5	U	5	U	5	U	5	U					5	U	5	U	5	U	5	U	5	U	5	U		5	U	5	U	5	U	5	U	5	U	5	U
Di-n-butyl phthalate	220	1400	20	U	20	U	20	U	20	U	20	U	20	U					20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Di-n-octyl phthalate	58	6200	20	U	20	U	20	U	20	U	20	U	20	U					20	UJ	19.9	U	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
PCBs	**mg/kg OC**	**µg/kg dw**																																								
Total Aroclors	12	130 (14) [4]	4	U	4	U	4	U	4	U	4	U	4	U					4	U	4	U	4	U	4	U	4	U	4	U		4	U	4	U	4	U	4	U	4	U	4	U

Table 1: Chemicals of Concern Concentrations and Screening Criteria
Whitmarsh Landfill Remediation, Anacortes, Washington

Analyte	Screening Criteria		Growsource												Sunland Bark & Topsoil												Granite						Miles Sand & Gravel					
			Type A Topsoil						Compost						Type A Topsoil						Compost						Common Borrow						Common Borrow					
			20240911-GS-TAT-XX-1		20240911-GS-TAT-XX-2		20240911-GS-TAT-XX-3		20240911-GS-C-XX-1		20240911-GS-C-XX-2		20240911-GS-C-XX-3		20240911-SBT-TAT-XX-1		20240911-SBT-TAT-XX-2		20240911-SBT-TAT-XX-3		20240911-SBT-C-XX-1		20240911-SBT-C-XX-2		20240911-SBT-C-XX-3			20240911-G-CB-XX-1		20240911-G-CB-XX-2		20240911-G-CB-XX-3		20240911-MSG-CB-XX-1		20240911-MSG-CB-XX-2		20240911-MSG-CB-XX-3	
	Marine Sediment Quality Standards	AETs Marine Sediment Cleanup Objective (SCO) [1]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	MTCA Method A	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]
Polycyclic Aromatic Hydrocarbons	**mg/kg OC**	**µg/kg dw**	**µg/kg dw**																																			
Total LPAH	370	5200	120		120		120		120		120		120		120		119.4		119.4		120		121.5		126.1			120		118.8		120		120		120		119.4	
2-Methylnaphthalene	38	670	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Acenaphthene	16	500	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Acenaphthylene	66	1300	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ	19.9	UJ	20	UJ	20	UJ	20	UJ		20	UJ	19.8	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ
Anthracene	220	960	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Fluorene	23	540	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Naphthalene	99	2100	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	20	U	20	U		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Phenanthrene	100	1500	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	U	21.5	J	26.1	J		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Total HPAH	960	12000	184.9		184.9		185		184.9		185		184.9		190.1		194.1		166.4		211.8		227.4		245.9			184.9		183.3		185		185		185		184.2	
Benz[a]anthracene	110	1300	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Benzo[a]pyrene	99	1600	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Benzo[g,h,i]perylene	31	670	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Chrysene	110	1400	20	U	20	U	20	U	20	U	20	U	20	U	20	U	19.9	U	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Dibenzo[a,h]anthracene	12	230	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ		5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Fluoranthene	67[4]	67[4]	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	19.4	J	19.7	J	22.8	J	11.7	J	39.8	J	48.2	J	61.2	J		20	UJ	19.8	UJ	20	UJ	20	U	20	U	19.9	U
Indeno[1,2,3-c,d]pyrene	34	600	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	U	19.9	UJ	19.9	U	20	UJ	20	UJ	20	UJ		20	U	19.8	U	20	U	20	U	20	U	19.9	U
Pyrene	5[4]	5[4]	20	U	20	U	20	U	20	U	20	U	20.5	J	25.4	J	27	J	10.3	J	27.1	J	34.2	J	39.8	J		20	UJ	19.8	UJ	20	UJ	20	UJ	20	UJ	19.9	UJ
Total benzofluoranthenes	230	3200	39.9	UJ	39.9	UJ	40	UJ	39.9	UJ	40	UJ	40	UJ	40	UJ	39.8	UJ	39.9	U	39.9	UJ	40	UJ	39.9	UJ		39.9	U	39.7	U	40	U	40	U	40	U	39.9	U
Carcinogenic Polycyclic Aromatic Hydrocarbons (sum TEQ [µg/kg])		21[3]																																				
ND= 1/2 U			10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6		10.6			10.6		10.6		10.6		10.6		10.6		10.6	
Dioxins/Furans		**ng/kg TEQ**	**ng/kg dw**																																			
Dioxin/Furans Congeners (sum of TEQ [ng/kg])																																						
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC)			1.05		1.63		1.14		1.60		1.31		1.17		2.81		8.46		2.86		6.51		5.42		7.23														
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC)		5[5]	0.26		0.48		0.42		0.50		0.73		0.40		1.77		7.66		2.14		5.51		4.82		6.77														
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND)			1.05		1.58		1.13		1.60		1.23		1.16		2.71		7.88		2.79		6.09		5.08		6.90														
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):			0.24		0.39		0.40		0.50		0.55		0.38		1.56		6.50		1.99		4.67		4.14		6.12														

Table 1: Chemicals of Concern Concentrations and Screening Criteria
Whitmarsh Landfill Remediation, Anacortes, Washington

Analyte	Screening Criteria		Growsource										Sunland Bark & Topsoil												Granite						Miles Sand & Gravel					
			Type A Topsoil						Compost				Type A Topsoil						Compost						Common Borrow						Common Borrow					
			20240911-GS-TAT-XX-1		20240911-GS-TAT-XX-2		20240911-GS-TAT-XX-3		20240911-GS-C-XX-1		20240911-GS-C-XX-2		20240911-GS-C-XX-3		20240911-SBT-TAT-XX-1		20240911-SBT-TAT-XX-2		20240911-SBT-TAT-XX-3		20240911-SBT-C-XX-1		20240911-SBT-C-XX-2		20240911-SBT-C-XX-3		Upland Screening Criteria	20240911-G-CB-XX-1		20240911-G-CB-XX-2		20240911-G-CB-XX-3		20240911-MSG-CB-XX-1		20240911-MSG-CB-XX-2		20240911-MSG-CB-XX-3	
	Marine Sediment Quality Standards	AETs Marine Sediment Cleanup Objective (SCO) [1]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	MTCA Method A	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]	Value	Q[7]
Total Petroleum Hydrocarbons		mg/kg dw	mg/kg dw																																	
TPH-G		100 [6]																							100 [6]	7	U	6.54	U	9.97	U	4.61	U	4.99	U	5.16	U
TPH-D		2000 [6]																							2000 [6]	5.3	U	5.26	U	5.24	U	5.3	U	5.26	U	5.3	U

Note(s)

Red text indicates exceeded screening criteria values

Highlight indicates the test was intended to characterize Sand/Backfill for Sand Drains

[1] From Table 8-1 in Sediment Cleanup User's Manual except where noted (SCUM; Ecology 2021); values are for protection of aquatic biota.

[2] Analytical method that will be used for the constituent analysis (from Appendix D: Table D-1 in Sediment Cleanup User's Manual (SCUM; Ecology 2021).

[3] Number in parentheses is Natural background from Bold study (From Table 10-1 in Sediment Cleanup User's Manual [SCUM; Ecology 2021]).

[4] The number in parentheses is the highest of the practical quantitation limits (from Appendix D: Table D-1 in Sediment Cleanup User's Manual [SCUM; Ecology 2021]).

[5] Dioxin/Furan criterion is the practical quantitation limit from Table 11-1 in Sediment Cleanup User's Manual [SCUM; Ecology 2021]).

[6] Criterion from Table 740-1 (Method A Soil Cleanup Levels for Unrestricted Land Uses) in WAC 173-340.

[7] Combined labortory and data validation qualifier

Abbreviation(s)

µg/kg dw = microgram per kilogram dry weight

EPA = US Environmental Protection Agency

mg/kg dw = milligrams per kilogram dry weight

mg/kg OC = milligrams per kilogram organic carbon

NA = Not Applicable

ng/kg = nanogram per kilogram

SCO = Sediment Cleanup Objective

TEQ = toxicity equivalent quotient

Total HPAH = High molecular weight polycyclic aromatic hydrocarbons

Total LPAH = Low molecular weight polycyclic aromatic hydrocarbons

D = The reported value is from a dilution.

U = The material was analyzed for, but was not detected above the level of the associated value.

J = The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Table 2: Soil Health Parameter Sample Results from Soiltest Farm Consultants, Inc.
Whitmarsh Landfill Remediation, Anacortes, Washington

Sample ID	pH 1:1	Electrical Conductivity (mmhos/cm)		Organic Matter (%)	Texture			
		Soil Water Extract 1:1	Saturated Paste		Sand (%)	Clay (%)	Silt (%)	USDA Texture
20240911-SBT-TAT-1	7	0.41	1.07	5.3	80	6	14	Loamy Sand
20240911-SBT-TAT-2	7.1	0.48	1.25	5.9	82	8	10	
20240911-GS-TAT-1	8	2.11	5.49	16.3	84	9	7	
20240911-GS-TAT-2	8.1	4.4	11.44	13.1	81	6	13	
20240911-SBT-C-1	7.5	6.47	16.82	39.4	76	9	15	
20240911-SBT-C-2	7.5	6.98	18.15	61.6	78	8	14	
20240911-GS-C-1	8.1	14.64	38.06	24.7	84	6	10	Loamy Sand
20240911-GS-C-2	8.1	14.2	36.92	22.6	86	4	10	Loamy Sand

Abbreviation(s)

C = Compost

GS = Growsource

ID = Identification

mmhos/cm = illimhos per centimeter

SBT = Sundland Bark & Topsoil

TAT = Type A Topsoil

USDA = U.S. Department of Agriculture

Table 3: Geotechnical Sample Results from Materials Testing and Consulting, Inc.
Whitmarsh Landfill Remediation, Anacortes, Washington

Sieve Size	Actual Cumulative Percent Passing (%)					
	20240912-MSG-CB-1	20240912-MSG-CB-2	20240912-MSG-CB-3	20240912-G-CB-1	20240912-G-CB-2	20240912-G-CB-3
2.00"	100	100	100	100	100	100
1.00"	99	100	100	100	100	100
3/4"	96	99	98	99	95	97
1/2"	85	89	88	87	85	88
3/8"	79	80	79	79	78	81
#4	62	58	55	58	62	64
#10	45	38	38	37	45	46
#20	--	--	--	20	--	--
#40	17	13	14	12	18	18
#60	--	--	--	8	--	--
#100	10	6	5	6	10	11
#200	7.4	4.4	4.1	4.6	7.7	8.4

Abbreviation(s)

C = Compost

CB = Common Borrow

G = Granite

GS = Growsource

MSG = Miles Sand and Gravel

SBT = Sundland Bark & Topsoil

TAT = Type A Topsoil

APPENDIX A

LABORATORY TEST REPORTS

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
Office: (509)765-1622 - Fax:(509)765-0314 - (800)764-1622

Soil PAP NAPT 2023

Soil & Plant Program 2023 NAPT Participating Laboratory

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21700

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-SBT-TAT-1
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		7.0	
E.C. 1:1	m.mhos/cm	0.41	
Est Sat Paste E.C.	m.mhos/cm	1.07	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	5.3	ENR: 107

Other Tests:

Texture: 80.0 % Sand, 6.0 % Clay, 14.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21700 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
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Soil PAP NAPT 2023

Soil & Plant Program 2023 NAPT Participating Laboratory

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21701

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-SBT-TAT-2
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		7.1	
E.C. 1:1	m.mhos/cm	0.48	
Est Sat Paste E.C.	m.mhos/cm	1.25	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	5.9	ENR: 117

Other Tests:

Texture: 82.0 % Sand, 8.0 % Clay, 10.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21701 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

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2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
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SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21702

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-SBT-C-1
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		7.5	
E.C. 1:1	m.mhos/cm	6.47	
Est Sat Paste E.C.	m.mhos/cm	16.82	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	39.4	ENR: 120

Other Tests:

Texture: 76.0 % Sand, 9.0 % Clay, 15.0 % Silt

USDA TEXTURE: SANDY LOAM

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21702 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

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Soil PAP NAPT 2023

Soil & Plant Program 2023 NAPT Participating Laboratory

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21703

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-SBT-C-2
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1			7.5	
E.C. 1:1	m.mhos/cm		6.98	
Est Sat Paste E.C.	m.mhos/cm		18.15	
Effervescence				
				Lbs/Acre
Ammonium - N	mg/kg			
Organic Matter W.B.	%		61.6	ENR: 120

Other Tests:

Texture: 78.0 % Sand, 8.0 % Clay, 14.0 % Silt

USDA TEXTURE: SANDY LOAM

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21703 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
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SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21704

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-GS-TAT-1
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		8.0		
E.C. 1:1	m.mhos/cm	2.11		
Est Sat Paste E.C.	m.mhos/cm	5.49		
Effervescence				
				Lbs/Acre
Ammonium - N	mg/kg			
Organic Matter W.B.	%	16.3	ENR:	120

Other Tests:

Texture: 84.0 % Sand, 9.0 % Clay, 7.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21704 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

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Soil PAP NAPT 2023

Soil & Plant Program 2023 NAPT Participating Laboratory

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21705

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-GS-TAT-2
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		8.1	
E.C. 1:1	m.mhos/cm	4.40	
Est Sat Paste E.C.	m.mhos/cm	11.44	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	13.1	ENR: 120

Other Tests:

Texture: 81.0 % Sand, 6.0 % Clay, 13.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21705 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
Office: (509)765-1622 - Fax:(509)765-0314 - (800)764-1622

Soil PAP NAPT 2023

Soil & Plant Program 2023 NAPT Participating Laboratory

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21706

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-GS-C-1
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		8.1	
E.C. 1:1	m.mhos/cm	14.64	
Est Sat Paste E.C.	m.mhos/cm	38.06	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	24.7	ENR: 120

Other Tests:

Texture: 84.0 % Sand, 6.0 % Clay, 10.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21706 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

soiltest farm consultants, inc.
2925 Driggs Dr., Moses Lake, Wa 98837 - www.soiltestlab.com
Office: (509)765-1622 - Fax:(509)765-0314 - (800)764-1622

SOILTEST FARM CONSULTANTS - 11
2925 DRIGGS DR

Moses Lake , WA 98837

Laboratory #: S24-21707

Date Received: 9/13/2024
Grower: WSP USA
Field: 20240911-GS-C-2
Sampled By:
Customer Account #:
Customer Sample ID:

Soil Test Results

pH 1:1		8.1	
E.C. 1:1	m.mhos/cm	14.20	
Est Sat Paste E.C.	m.mhos/cm	36.92	
Effervescence			
			Lbs/Acre
Ammonium - N	mg/kg		
Organic Matter W.B.	%	22.6	ENR: 120

Other Tests:

Texture: 86.0 % Sand, 4.0 % Clay, 10.0 % Silt

USDA TEXTURE: LOAMY SAND

We make every effort to provide an accurate analysis of your sample. For reasonable cause we will repeat tests, but because of factors beyond our control in sampling procedures and the inherent variability of soil, our liability is limited to the price of the tests. Recommendations are to be used as general guides and should be modified for specific field conditions and situations. Note: "u" indicates that the element was analyzed for but not detected

This is your Invoice #: S24-21707 Account #: 101100 Reviewed by: K. Bair, PhD, C List Cost: $58.00

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1500
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: MSG-CB-2
Sample#: B24-1500

Date Received: 12-Sep-24
Sampled By: Client
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW, Well-graded Sand with Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

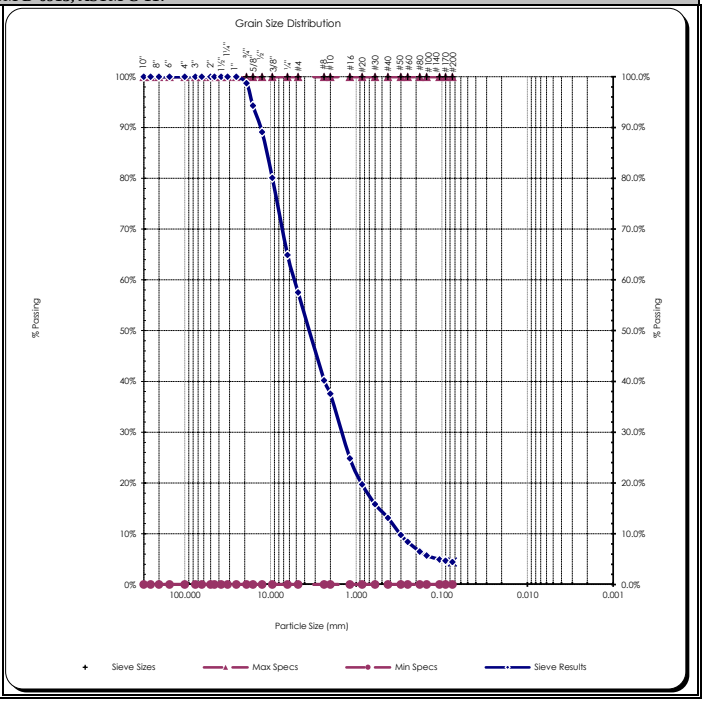
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.110	mm	% Gravel =	42.5%	Coeff. of Curvature, C_C = 1.40
$D_{(10)}$ =	0.310	mm	% Sand =	53.1%	Coeff. of Uniformity, C_U = 17.02
$D_{(15)}$ =	0.547	mm	% Silt & Clay =	4.4%	Fineness Modulus = 4.67
$D_{(30)}$ =	1.512	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	3.713	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 5.0%
$D_{(60)}$ =	5.274	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	13.111	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	1/3		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		94%	100.0%	0.0%
1/2"	12.50	89%	89%	100.0%	0.0%
3/8"	9.50	80%	80%	100.0%	0.0%
1/4"	6.30		65%	100.0%	0.0%
#4	4.75	58%	58%	100.0%	0.0%
#8	2.36		40%	100.0%	0.0%
#10	2.00	38%	38%	100.0%	0.0%
#16	1.18		25%	100.0%	0.0%
#20	0.850		20%	100.0%	0.0%
#30	0.600		16%	100.0%	0.0%
#40	0.425	13%	13%	100.0%	0.0%
#50	0.300		10%	100.0%	0.0%
#60	0.250		8%	100.0%	0.0%
#80	0.180		6%	100.0%	0.0%
#100	0.150	6%	6%	100.0%	0.0%
#140	0.106		5%	100.0%	0.0%
#170	0.090		5%	100.0%	0.0%
#200	0.075	4.4%	4.4%	100.0%	0.0%

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Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Client
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	MSG-CB-2	**Tested By:**	S. Boesenberg
Sample #:	B24-1500	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW, Well-graded Sand with Gravel
Sample Color
Brown

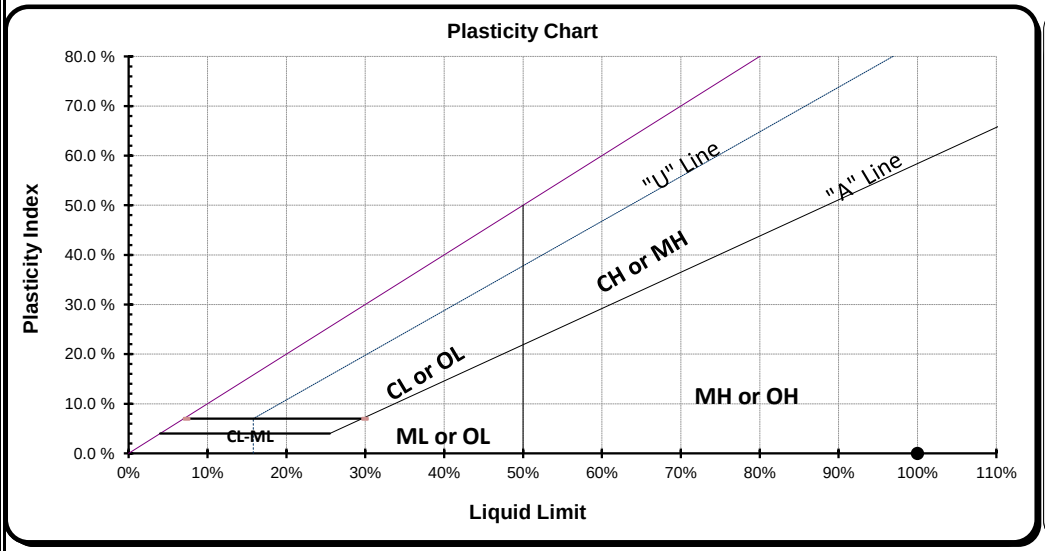
Liquid Limit Determination

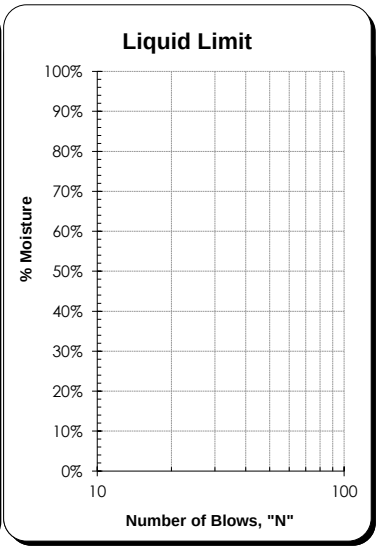
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:	Can not test per limits given in ASTM D4318					
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:	Can not test per limits given in ASTM D4318					
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1501
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: MSG-CB-3
Sample#: B24-1501

Date Received: 12-Sep-24
Sampled By: Client
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW, Well-graded Sand with Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

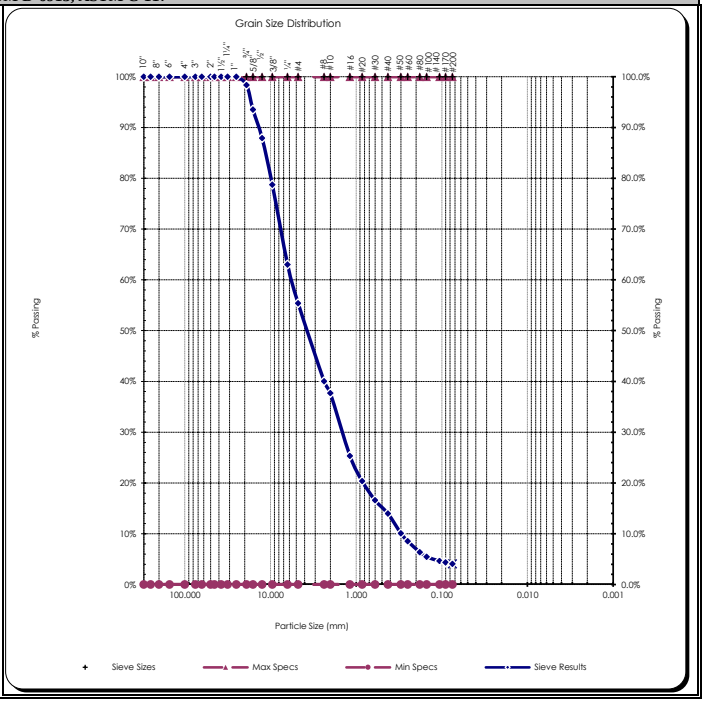
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.126	mm	% Gravel =	44.6%	Coeff. of Curvature, C_C = 1.31
$D_{(10)}$ =	0.297	mm	% Sand =	51.3%	Coeff. of Uniformity, C_U = 19.13
$D_{(15)}$ =	0.494	mm	% Silt & Clay =	4.1%	Fineness Modulus = 4.70
$D_{(30)}$ =	1.490	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	3.911	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 5.0%
$D_{(60)}$ =	5.687	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	13.809	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	7/24		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	98%	98%	100.0%	0.0%
5/8"	16.00		94%	100.0%	0.0%
1/2"	12.50	88%	88%	100.0%	0.0%
3/8"	9.50	79%	79%	100.0%	0.0%
1/4"	6.30		63%	100.0%	0.0%
#4	4.75	55%	55%	100.0%	0.0%
#8	2.36		40%	100.0%	0.0%
#10	2.00	38%	38%	100.0%	0.0%
#16	1.18		25%	100.0%	0.0%
#20	0.850		20%	100.0%	0.0%
#30	0.600		17%	100.0%	0.0%
#40	0.425	14%	14%	100.0%	0.0%
#50	0.300		10%	100.0%	0.0%
#60	0.250		9%	100.0%	0.0%
#80	0.180		6%	100.0%	0.0%
#100	0.150	5%	5%	100.0%	0.0%
#140	0.106		5%	100.0%	0.0%
#170	0.090		4%	100.0%	0.0%
#200	0.075	4.1%	4.1%	100.0%	0.0%

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Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Client
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	MSG-CB-3	**Tested By:**	S. Boesenberg
Sample #:	B24-1501	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW, Well-graded Sand with Gravel
Sample Color
Brown

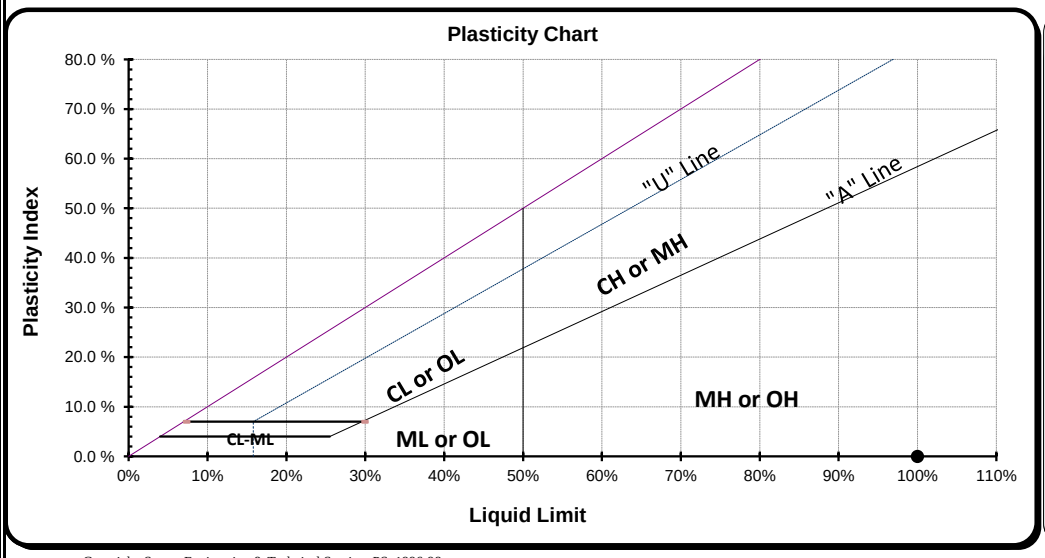
Liquid Limit Determination

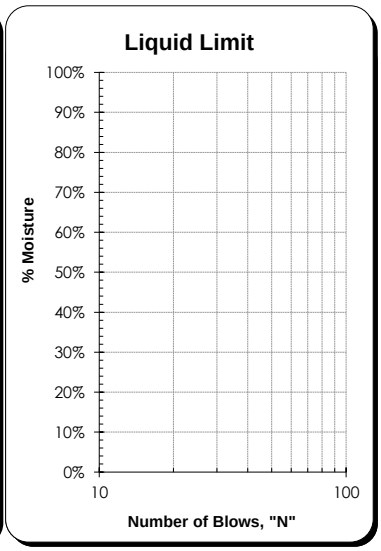
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			Can Not Test per limit given in ASTM D4318			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			N/A			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1502
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: MSG-CB-1
Sample#: B24-1502

Date Received: 12-Sep-24
Sampled By: Client
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

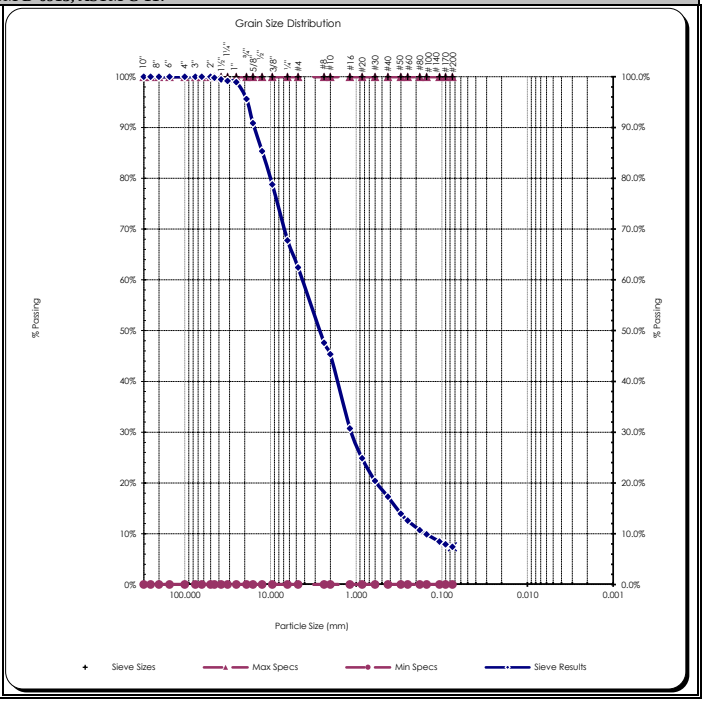
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.051	mm	% Gravel =	37.6%	Coeff. of Curvature, C_C = 1.93
$D_{(10)}$ =	0.154	mm	% Sand =	55.0%	Coeff. of Uniformity, C_U = 28.30
$D_{(15)}$ =	0.340	mm	% Silt & Clay =	7.4%	Fineness Modulus = 4.41
$D_{(30)}$ =	1.139	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	2.749	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 4.9%
$D_{(60)}$ =	4.360	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	15.455	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	3/7		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		99%	100.0%	0.0%
1.25"	31.50		99%	100.0%	0.0%
1.00"	25.00	99%	99%	100.0%	0.0%
3/4"	19.00	96%	96%	100.0%	0.0%
5/8"	16.00		91%	100.0%	0.0%
1/2"	12.50	85%	85%	100.0%	0.0%
3/8"	9.50	79%	79%	100.0%	0.0%
1/4"	6.30		68%	100.0%	0.0%
#4	4.75	62%	62%	100.0%	0.0%
#8	2.36		48%	100.0%	0.0%
#10	2.00	45%	45%	100.0%	0.0%
#16	1.18		31%	100.0%	0.0%
#20	0.850		25%	100.0%	0.0%
#30	0.600		20%	100.0%	0.0%
#40	0.425	17%	17%	100.0%	0.0%
#50	0.300		14%	100.0%	0.0%
#60	0.250		13%	100.0%	0.0%
#80	0.180		11%	100.0%	0.0%
#100	0.150	10%	10%	100.0%	0.0%
#140	0.106		8%	100.0%	0.0%
#170	0.090		8%	100.0%	0.0%
#200	0.075	7.4%	7.4%	100.0%	0.0%

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Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Client
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	MSG-CB-1	**Tested By:**	S. Boesenberg
Sample #:	B24-1502	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color
Brown

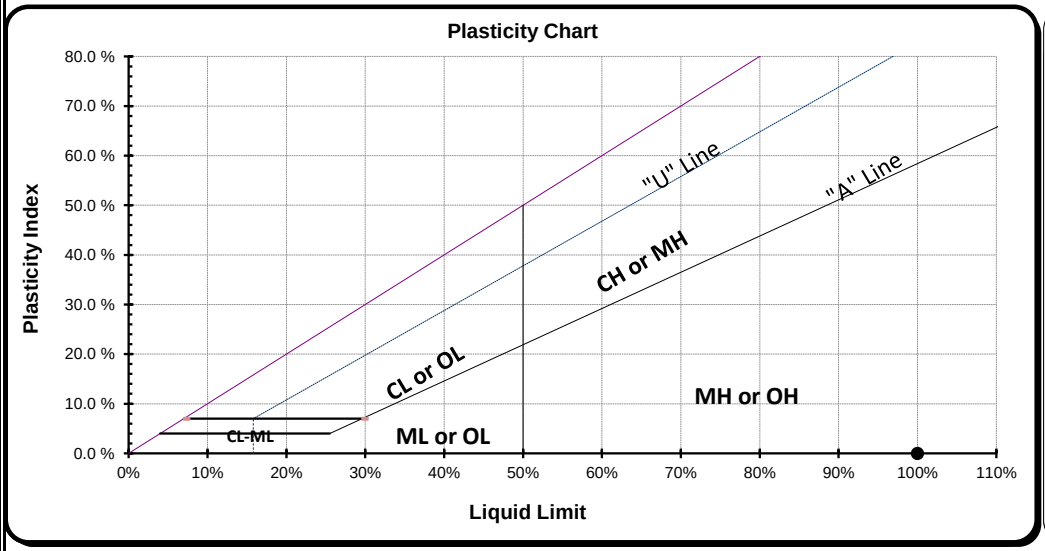
Liquid Limit Determination

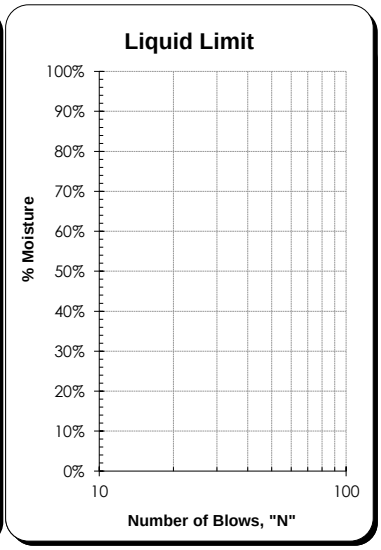
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			See Comments			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			N/A			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1503
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: G-CB-1
Sample#: B24-1503

Date Received: 12-Sep-24
Sampled By: Client
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW, Well-graded Sand with Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

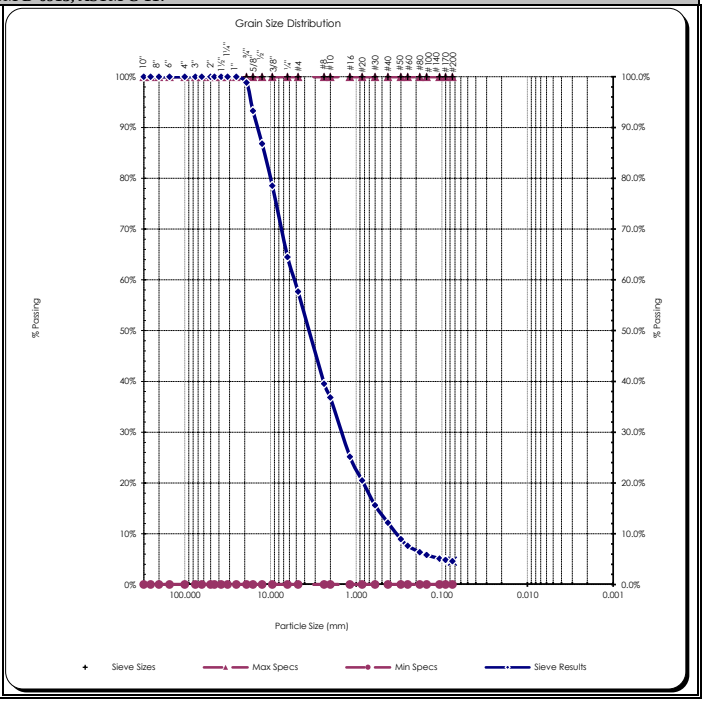
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.100	mm	% Gravel =	42.3%	Coeff. of Curvature, C_C = 1.28
$D_{(10)}$ =	0.341	mm	% Sand =	53.1%	Coeff. of Uniformity, C_U = 15.48
$D_{(15)}$ =	0.569	mm	% Silt & Clay =	4.6%	Fineness Modulus = 4.70
$D_{(30)}$ =	1.520	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	3.739	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 4.8%
$D_{(60)}$ =	5.282	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	14.228	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	17/45		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		93%	100.0%	0.0%
1/2"	12.50	87%	87%	100.0%	0.0%
3/8"	9.50	79%	79%	100.0%	0.0%
1/4"	6.30		64%	100.0%	0.0%
#4	4.75	58%	58%	100.0%	0.0%
#8	2.36		40%	100.0%	0.0%
#10	2.00	37%	37%	100.0%	0.0%
#16	1.18		25%	100.0%	0.0%
#20	0.850	20%	20%	100.0%	0.0%
#30	0.600		16%	100.0%	0.0%
#40	0.425	12%	12%	100.0%	0.0%
#50	0.300		9%	100.0%	0.0%
#60	0.250	8%	8%	100.0%	0.0%
#80	0.180		6%	100.0%	0.0%
#100	0.150	6%	6%	100.0%	0.0%
#140	0.106		5%	100.0%	0.0%
#170	0.090		5%	100.0%	0.0%
#200	0.075	4.6%	4.6%	100.0%	0.0%

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Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Client
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	G-CB-1	**Tested By:**	S. Boesenberg
Sample #:	B24-1503	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW, Well-graded Sand with Gravel
Sample Color
Brown

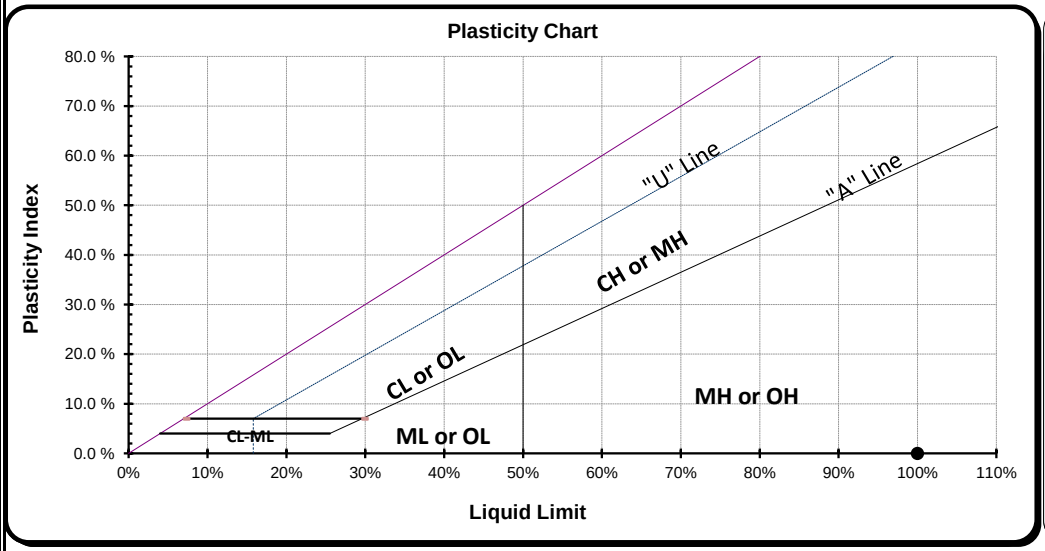
Liquid Limit Determination

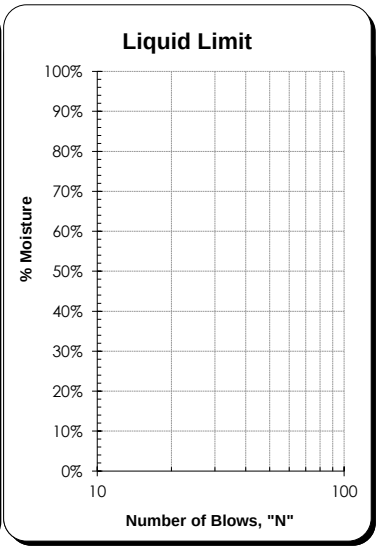
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			See Comments			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			N/A			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1504
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: G-CB-2
Sample#: B24-1504

Date Received: 12-Sep-24
Sampled By: Client
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

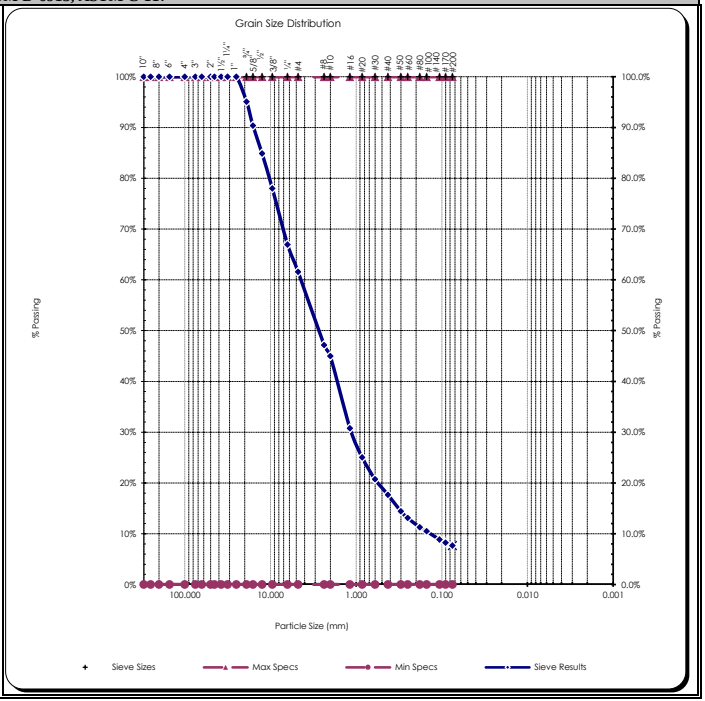
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.049	mm	% Gravel =	38.4%	Coeff. of Curvature, C_C = 2.09
$D_{(10)}$ =	0.137	mm	% Sand =	53.9%	Coeff. of Uniformity, C_U = 32.75
$D_{(15)}$ =	0.323	mm	% Silt & Clay =	7.7%	Fineness Modulus = 4.42
$D_{(30)}$ =	1.136	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	2.832	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 4.2%
$D_{(60)}$ =	4.491	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	15.767	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	43/99		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	95%	95%	100.0%	0.0%
5/8"	16.00		90%	100.0%	0.0%
1/2"	12.50	85%	85%	100.0%	0.0%
3/8"	9.50	78%	78%	100.0%	0.0%
1/4"	6.30		67%	100.0%	0.0%
#4	4.75	62%	62%	100.0%	0.0%
#8	2.36		47%	100.0%	0.0%
#10	2.00	45%	45%	100.0%	0.0%
#16	1.18		31%	100.0%	0.0%
#20	0.850		25%	100.0%	0.0%
#30	0.600		21%	100.0%	0.0%
#40	0.425	18%	18%	100.0%	0.0%
#50	0.300		14%	100.0%	0.0%
#60	0.250		13%	100.0%	0.0%
#80	0.180		11%	100.0%	0.0%
#100	0.150	10%	10%	100.0%	0.0%
#140	0.106		9%	100.0%	0.0%
#170	0.090		8%	100.0%	0.0%
#200	0.075	7.7%	7.7%	100.0%	0.0%

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Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Client
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	G-CB-2	**Tested By:**	S. Boesenberg
Sample #:	B24-1504	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color
Brown

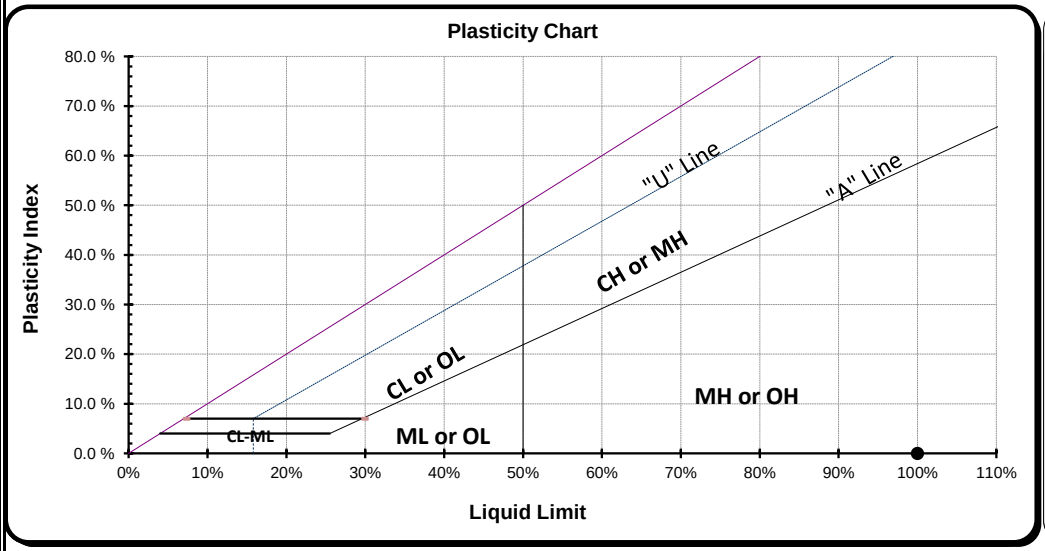
Liquid Limit Determination

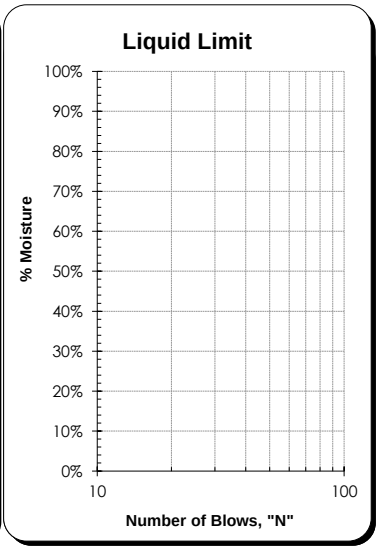
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			See Comments			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			N/A			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Client:	WSP USA, Inc.	**Date:**	September 19, 2024
Address:	One Penn Plaza 4th Floor	**Project:**	Q.C. Whitmarsh Landfill Remediation
	New York, NY 10119	**Project #:**	24B181
Attn:	Koorus Tahghighi	**Sample #:**	B24-1505
Revised On:		**Date sampled:**	September 12, 2024
		Control No:	

As requested and authorized by the Client, MTC has performed the following test(s) on the sample number referenced above. The testing was performed in accordance with current, applicable AASHTO, ASTM, and/or WSDOT standards, which are referenced on the correlating test report pages. The results obtained in our laboratory are as detailed below and/or on the following pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	See Attached Report		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
	Sand Equivalent			WSDOT Degradation	
	Fracture Count			LA Abrasion	
	Moisture Content			Cation Exchange Capacity	
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
X	Atterberg Limits	Non-Plastic			
	Specific Gravity of Soils				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call the number below and ask to speak with your Project Manager or the Laboratory Manager.

Mark Peterson

Respectfully Submitted,
Name
WABO Supervising Laboratory Technician

Sieve Report

Project: Q.C. Whitmarsh Landfill Remediation
Project #: 24B181
Client: WSP USA, Inc.
Source: G-CB-3
Sample#: B24-1505

Date Received: 12-Sep-24
Sampled By: Others
Date Tested: 18-Sep-24
Tested By: S. Boesenberg
Control No.:

Unified Soil Classification System, ASTM-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color:
Brown

Method(s) ASTM D-2216, ASTM D-2419, ASTM D4318, ASTM D-5281

Specifications
No Specs

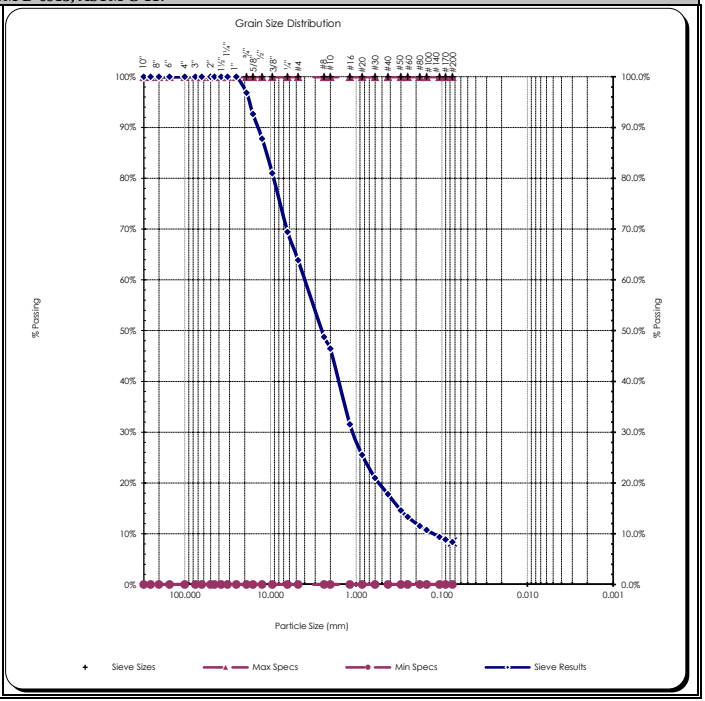
Sample Meets Specs ? N/A

$D_{(5)}$ =	0.045	mm	% Gravel =	36.1%	Coeff. of Curvature, C_C = 2.29
$D_{(10)}$ =	0.127	mm	% Sand =	55.5%	Coeff. of Uniformity, C_U = 32.63
$D_{(15)}$ =	0.316	mm	% Silt & Clay =	8.4%	Fineness Modulus = 4.32
$D_{(30)}$ =	1.096	mm	Liquid Limit =	0.0%	Plastic Limit = 0.0%
$D_{(50)}$ =	2.560	mm	Plasticity Index =	0.0%	Moisture %, as sampled = 4.1%
$D_{(60)}$ =	4.139	mm	Sand Equivalent =	n/a	Req'd Sand Equivalent =
$D_{(90)}$ =	14.086	mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =
Dust Ratio =	8/17		Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =

Method(s) ASTM C-136, ASTM D-6913, ASTM C-117

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	97%	97%	100.0%	0.0%
5/8"	16.00		93%	100.0%	0.0%
1/2"	12.50	88%	88%	100.0%	0.0%
3/8"	9.50	81%	81%	100.0%	0.0%
1/4"	6.30		69%	100.0%	0.0%
#4	4.75	64%	64%	100.0%	0.0%
#8	2.36		49%	100.0%	0.0%
#10	2.00	46%	46%	100.0%	0.0%
#16	1.18		32%	100.0%	0.0%
#20	0.850		26%	100.0%	0.0%
#30	0.600		21%	100.0%	0.0%
#40	0.425	18%	18%	100.0%	0.0%
#50	0.300		15%	100.0%	0.0%
#60	0.250		13%	100.0%	0.0%
#80	0.180		11%	100.0%	0.0%
#100	0.150	11%	11%	100.0%	0.0%
#140	0.106		9%	100.0%	0.0%
#170	0.090		9%	100.0%	0.0%
#200	0.075	8.4%	8.4%	100.0%	0.0%

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All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Comments:

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

ASTM D-4318 Liquid Limit, Plastic Limit & Plasticity Index of Soils

Project:	Q.C. Whitmarsh Landfill Remed	**Date Received:**	12-Sep-24
Project #:	24B181	**Sampled By:**	Others
Client:	WSP USA, Inc.	**Date Tested:**	18-Sep-24
Source:	G-CB-3	**Tested By:**	S. Boesenberg
Sample #:	B24-1505	**Control No.:**	

Unified Soils Classification System, ASTM D-2487
SW-SC, Well-graded Sand with Silty Clay and Gravel
Sample Color
Brown

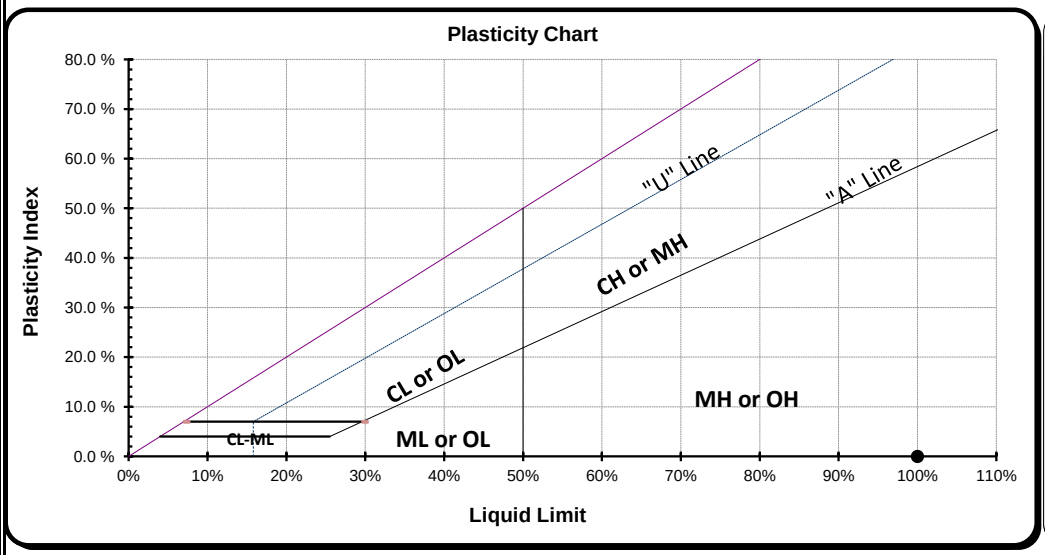
Liquid Limit Determination

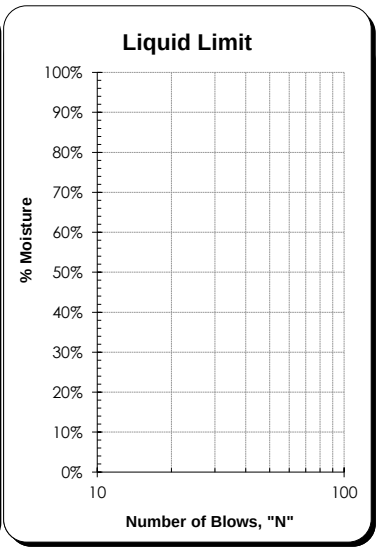
	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			See Comments			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						
Number of Blows:						

Liquid Limit @ 25 Blows: N/A
Plastic Limit: N/A
Plasticity Index, I_p: N/A

Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:						
Weight of Dry Soils + Pan:			N/A			
Weight of Pan:						
Weight of Dry Soils:						
Weight of Moisture:						
% Moisture:						





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All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Comments: Sample is non-plastic. Could not establish a liquid limit.

Reviewed by: Mark Peterson
Name
WABO Supervising Laboratory Technician

Analytical Resources, LLC
Analytical Chemists and Consultants
Tukwila, WA

06 November 2024

Accounts Payable
WSP USA, Inc.
840 HOWE STREET, #1000
VANCOUVER, BRITISH COLUMBIA V6Z 2M1

RE: Whitmarsh (Whitmarsh)

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
24I0364	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, LLC



Kelly Bottem, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103629	Turn-around Requested:
ARI Client Company: WSP USA	Phone:
Client Contact: ~~Cliff.whitmus@wsp.com (206) 300-0520~~ koorus.tahghighi@wsp.com (206) 641-6301	
Client Project Name: Import Material Sampling - Whitmarsh Landfill	
Client Project #: US-EI-PS2120410	Samplers: Lindsey Wielick

Page: 1	of 10
Date:	Ice Present?
No. of Coolers: 3	Cooler Temps: 2.1, 3.3, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: ~~EPA 6010/6020 Metals~~ EPA 7471A	~~EPA 1613B~~ Dioxin	~~EPA 8082~~ PCBs/SVOC	~~EPA 8270~~ Archive	~~EPA 8081~~	~~EPA 8260~~ 8270	EPA (TOC) ~~9060A~~ TOC		Notes/Comments
20240911-GS-TAT-D-1	09/11/24	11:25	S	1		X							Refer to ARI quote for analysis
20240911-GS-TAT-A-1								X					
20240911-GS-TAT-PCB-1							X						
20240911-GS-TAT-TOC-1											X		
20240911-GS-TAT-M-1					X								
20240911-GS-TAT-D-2		11:40				X							
20240911-GS-TAT-A-2								X					
20240911-GS-TAT-PCB-2							X						
20240911-GS-TAT-TOC-2											X		
20240911-GS-TAT-M-2					X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Please refer to ~~ARI quote sent by~~ ~~Cliff Whitmus~~ for analytical method	Printed Name: Lindsey Wielick	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:26	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103604	Turn-around Requested:
ARI Client Company: WSP USA	Phone:
Client Contact: ~~Cliff.Whitmus@wsp.com (206) 300-0520~~ Kourus.tahghighi@wsp.com (206) 641-6301	
Client Project Name: Import Material Sampling - Whitmarsh Landfill	
Client Project #: US-EI-PS21204410	Samplers: Lindsey Wielick

Page: 2 of 10

Date: | Ice Present?

No. of Coolers: 3 | Cooler Temps: 2.1 3.3, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: EPA 6010/6020 Metals + EPA 7471A Hg	EPA 1613B Dioxin	PCB / SVOC EPA 8082	EPA 8270 EPA 8081	EPA 8260 8270	EPA TOC			Notes/Comments
20240911-GS-TAT-D-3	09/11/24	11:55	S	1		X							
20240911-GS-TAT-A-3								X					
20240911-GS-TAT-PCB-3							X						
20240911-GS-TAT-TOC-3										X			
20240911-GS-TAT-M-3					X								
20240911-GS-C-D-1		12:25				X							
20240911-GS-C-A-1								X					
20240911-GS-C-PCB-1							X						
20240911-GS-C-TOC-1										X			
20240911-GS-C-M-1					X								

Comments/Special Instructions	Relinquished by (Signature)	Received by (Signature)	Relinquished by (Signature)	Received by (Signature)
	Lindsey Wielick	SW		
	Printed Name: Lindsey Wielick	Printed Name: Swannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:28	Date & Time: 9-12-24 16:35	Date & Time:	Date & Time:

25 SW 9/12

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103b4	Turn-around Requested:
ARI Client Company: WSP USA	Phone:
Client Contact: ~~Cliff. Whitmus@wsp.com (206) 300-0520~~ kcoons, tchighighi@wsp.com (206)641-6301	
Client Project Name: Import Material Sampling - Whitmarsh Landfill	
Client Project #: US-EI-PS21204410	Samplers: Lindsey Wielick

Page: 3	of 10
Date:	Ice Present? Yes
No. of Coolers: 3	Cooler Temps: 2.1, 3.3, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: EPA 6010/6020 Metals	EPA 7471A	EPA 1613B Dioxin	EPA 8082 PCB/SVOC	EPA 8270 Archive	EPA 8081	EPA 8260/8270	EPA TOC 9060A	Notes/Comments
20240911-GS-C-D-2	09/11/24	~~12:25~~ 12:40	S	1			X						Refer to ARI quote for analysis
20240911-GS-C-A-2									X				
20240911-GS-C-PCB-2								X					
20240911-GS-C-TOC-2												X	
20240911-GS-C-M-2					X	X							
20240911-GS-C-D-3		~~12:40~~ 12:50					X						
20240911-GS-C-A-3									X				
20240911-GS-C-PCB-3								X					
20240911-GS-C-TOC-3												X	
20240911-GS-C-M-3					X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Lindsey Wielick	LW		
	Printed Name: Lindsey Wielick	Printed Name: Sawannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: Ari	Company:	Company:
	Date & Time: 09/12/24 16:35	Date & Time: 9-12-24 16:~~35~~25 LW 9/12	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 241031.4	Turn-around Requested:	Page: 4 of 10	
ARI Client Company: WSP USA	Phone:	Date:	Ice Present? Yes
Client Contact: ~~Cliff.Whitmus@wsp.com (206) 300-0520~~ koons.tahghighi@wsp.com (206) 641-4301		No. of Coolers: 3	Cooler Temps: 2.1, 0.9, 3.3
Client Project Name: Import Material Sampling - Whitmarsh Landfill			
Client Project #: VS-EI-PS21204410	Samplers: Lindsey Wielick		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: EPA 6010/6020 Metals	EPA 1613B Dioxin	EPA 8082 PCB/SVOC Archive	EPA 8270	EPA 8051	EPA 8260	EPA 8270	EPA TOC 9060A Mod			Notes/Comments
20240911-SBT-C-D-1	09/11/24	15:10	S	1		X									Refer to ARI quote for analysis
20240911-SBT-C-A-1								X							
20240911-SBT-C-PCB-1							X								
20240911-SBT-C-TOC-1												X			
20240911-SBT-C-M-1					X										
20240911-SBT-C-D-2		15:20				X									
20240911-SBT-C-A-2								X							
20240911-SBT-C-PCB-2							X								
20240911-SBT-C-TOC-2												X			
20240911-SBT-C-M-2					X										

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Wielick	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103e4	Turn-around Requested:
ARI Client Company: WSP USA	Phone:
Client Contact: ~~Cliff.Whitmyre@wsp.com (206) 300-0520~~ Koonus.tahahighi@wsp.com (206) 641-6301	
Client Project Name: Import Material sampling - Whitmarsh Landfill	
Client Project #: US-EI-PS21204410	Samplers: Lindsey Wielick

Page: 5 of 10

Date: | Ice Present? Yes

No. of Coolers: 3 | Cooler Temps: 2.1, 0.9, 2.3

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	EPA 6010/6020 Metals	EPA 7471A Hg	EPA 1613B Dioxin	EPA 8082 PCB/SVOC	EPA 8270 Archive SVOC	EPA 8081 OCP	EPA 8270 SVOC	EPA 9060A TOC	EPA 8260/8270 VOC	EPA 8270 SVOC	Notes/Comments
20240911-SBT-C-D-3	09/11/24	15:30	S	1			X								Refer to ARI QUOTE for analysis
20240911-SBT-C-A-3									X						
20240911-SBT-C-PCB-3								X							
20240911-SBT-C-TOC-3												X			
20240911-SBT-C-M-3					X										
20240911-SBT-TAT-D-1		16:00					X								
20240911-SBT-TAT-A-1									X						
20240911-SBT-TAT-PCB-1								X							
20240911-SBT-TAT-TOC-1												X			
20240911-SBT-TAT-M-1					X										

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Wielick	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24L0744	Turn-around Requested:	Page: 6 of 10	
ARI Client Company: WSP USA	Phone:	Date:	Ice Present? Yes
Client Contact: ~~Cliff Whitmus@wsp.com (206)300-0520~~ koorus.tahghighi@wsp.com (206)641-6301		No. of Coolers: 3	Cooler Temps: 2.1, 3.3, 4.0.9
Client Project Name: Import Material Sampling - Whitmarsh Landfill			
Client Project #: VS-ET-PS21204410	Samplers: Lindsey Wielick		

JW 9/12

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: EPA 6010/7471A Metals	EPA 8270 Dioxin	EPA 8082 PCB/Srgc	EPA 8270 Archive	EPA 8270/8081	EPA TOC 9060A			Notes/Comments
20240911-SBT-TAT-D-2	09/11/24	16:10	S	1		X							Refer to ARI quote for analysis
20240911-SBT-TAT-A-2								X					
20240911-SBT-TAT-PCB-2							X						
20240911-SBT-TAT-TOC-2										X			
20240911-SBT-TAT-M-2					X								
20240911-SBT-TAT-D-3		16:20				X							
20240911-SBT-TAT-A-3								X					
20240911-SBT-TAT-PCB-3							X						
20240911-SBT-TAT-TOC-3										X			
20240911-SBT-TAT-M-3					X								

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Wielick	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103-04	Turn-around Requested:
ARI Client Company: WSP USA	Phone:
Client Contact:	
Client Project Name: Import Material Sampling - Whitmarsh Landfill	
Client Project #: US-EJ-BS1204410	Samplers: LW

Page: 8 of 10
Date: Ice Present? Yes
No. of Coolers: 3 Cooler Temps: 3.3, 2.1, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: EPA 8260D (MTBE) / EPA 8021B	EPA 8082A	EPA 8270E / EPA 8270E LVI	EPA 8270E / 8081B	NWTPH-Dx	EPA TOC Aqueous	Diesel / Archive		Notes/Comments
~~20240912-G-BSD-TOC-3~~	~~09/12/24~~		S	1						X			
~~20240912-G-BSD-M-3~~					X								
20240912-G-CB-Dx/A-1	09/12	2408:35	S						X		X		
20240912-G-CB-~~NWTPHG~~ TPHG-1	TPHG	0		2									
20240912-G-CB-M-1					X								
20240912-G-CB-Dx/A-2		09:50							X		X		
20240912-G-CB-~~NWTPHG~~ TPHG-2				2									
20240912-G-CB-M-2					X								
20240912-G-CB-Dx/A-3		09:10							X		X		
20240912-G-CB-TPHG-3				2									

Refer to ARI quote for analysis

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Welick	Printed Name: Sawannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: ARI	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2410304	Turn-around Requested:
ARI Client Company:	Phone:
Client Contact:	
Client Project Name:	
Client Project #:	Samplers:

Page: 8 of 10

Date: | Ice Present? Yes

No. of Coolers: 3 | Cooler Temps: 3.3, 2.1, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: MRP 10 EPA 8081 8082	EPA 8270D	EPA 8260D	EPA 8270 (SIM)	NWTPH-Dx	Notes/Comments
20240912-G-CB-M-3	09/12/24	09:10	S	1	X					Refer to ARI quote for analysis
20240912-MSG-CB-Dx-1		11:15							X	
20240912-MSG-CB-TPHG-1				2				X		
20240912-MSG-CB-M-1					X					
20240912-MSG-CB-Dx-2		11:35							X	
20240912-MSG-CB-TPHG-2				2				X		
20240912-MSG-CB-M-2					X					
20240912-MSG-CB-Dx-3		11:50							X	
20240912-MSG-CB-TPHG-3				2				X		
20240912-MSG-CB-M-3					X					

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Lindsey Wielick	Savannah Wright		
	Printed Name: Lindsey Wielick	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: Ari	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:24	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 24103624	Turn-around Requested:
ARI Client Company:	Phone:
Client Contact:	
Client Project Name:	
Client Project #:	Samplers:

Page: ~~8~~ 9 of 10

Date: | Ice Present? Yes

No. of Coolers: 3 | Cooler Temps: 3.3, 2.1, 0.9

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	~~EPA 8081/8270 Pesticides~~	EPA TOC 9060A	PCB/SVOC	Archive					Notes/Comments
					Analysis Requested								
20240912-MSG-CB-TOC-3	09/12/24	11:50	S	1		X							Refer to ARI quote for analysis
~~20240912-MSG-BSD-TOC-3~~													
~~20240912-MSG-BSD-M-3~~				1	X								
20240912-MSG-CB-PCB-1		11:15 ~~08:35~~	S				X						
20240912-MSG-CB-PCB-2		11:35 ~~08:50~~					X						
20240912-MSG-CB-PCB-3		11:50					X						
20240912-MSG-CB-A-1		11:15						X					
20240912-MSG-CB-A-2		11:35						X					
20240912-MSG-CB-A-3		11:50						X					
20240912-MSG-CB-TOC-1		11:15				X							
20240912-MSG-CB-TOC-2		11:35				X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Wiehle	Printed Name: Savannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: Ari	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 2410304	Turn-around Requested:	Page: 10 of 10	
ARI Client Company: WSP USA	Phone:	Date:	Ice Present? Yes
Client Contact:		No. of Coolers: 3	Cooler Temps: 3.3, 2.1, 2.9
Client Project Name:			
Client Project #:	Samplers:		

Analytical Resources, LLC
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: TOC	Analysis Requested: PCB/SVOC	Notes/Comments
20240912-G-CB-TOC-1	09/12/24	08:35	S	1	X		Refer to ARI auote for analysis
20240912-G-CB-TOC-2		08:50			X		
20240912-G-CB-TOC-3		09:10			X		
20240912-G-CB-PCB-1		08:35				X	
20240912-G-CB-PCB-2		08:50				X	
20240912-G-CB-PCB-3		09:10				X	
Trip Blank	—	—	—	2			

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Lindsey Welker	Printed Name: Swannah Wright	Printed Name:	Printed Name:
	Company: WSP USA	Company: Ari	Company:	Company:
	Date & Time: 09/12/24 16:25	Date & Time: 9-12-24 16:25	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
20240911-GS-TAT-D-1	24I0364-01	Solid	11-Sep-2024 11:25	12-Sep-2024 16:25
20240911-GS-TAT-PCB-1	24I0364-03	Solid	11-Sep-2024 11:25	12-Sep-2024 16:25
20240911-GS-TAT-TOC-1	24I0364-04	Solid	11-Sep-2024 11:25	12-Sep-2024 16:25
20240911-GS-TAT-M-1	24I0364-05	Solid	11-Sep-2024 11:25	12-Sep-2024 16:25
20240911-GS-TAT-D-2	24I0364-06	Solid	11-Sep-2024 11:40	12-Sep-2024 16:25
20240911-GS-TAT-PCB-2	24I0364-08	Solid	11-Sep-2024 11:40	12-Sep-2024 16:25
20240911-GS-TAT-TOC-2	24I0364-09	Solid	11-Sep-2024 11:40	12-Sep-2024 16:25
20240911-GS-TAT-M-2	24I0364-10	Solid	11-Sep-2024 11:40	12-Sep-2024 16:25
20240911-GS-TAT-D-3	24I0364-11	Solid	11-Sep-2024 11:55	12-Sep-2024 16:25
20240911-GS-TAT-PCB-3	24I0364-13	Solid	11-Sep-2024 11:55	12-Sep-2024 16:25
20240911-GS-TAT-TOC-3	24I0364-14	Solid	11-Sep-2024 11:55	12-Sep-2024 16:25
20240911-GS-TAT-M-3	24I0364-15	Solid	11-Sep-2024 11:55	12-Sep-2024 16:25
20240911-GS-C-D-1	24I0364-16	Solid	11-Sep-2024 12:25	12-Sep-2024 16:25
20240911-GS-C-PCB-1	24I0364-18	Solid	11-Sep-2024 12:25	12-Sep-2024 16:25
20240911-GS-C-TOC-1	24I0364-19	Solid	11-Sep-2024 12:25	12-Sep-2024 16:25
20240911-GS-C-M-1	24I0364-20	Solid	11-Sep-2024 12:25	12-Sep-2024 16:25
20240911-GS-C-D-2	24I0364-21	Solid	11-Sep-2024 12:40	12-Sep-2024 16:25
20240911-GS-C-PCB-2	24I0364-23	Solid	11-Sep-2024 12:40	12-Sep-2024 16:25
20240911-GS-C-TOC-2	24I0364-24	Solid	11-Sep-2024 12:40	12-Sep-2024 16:25
20240911-GS-C-M-2	24I0364-25	Solid	11-Sep-2024 12:40	12-Sep-2024 16:25
20240911-GS-C-D-3	24I0364-26	Solid	11-Sep-2024 12:50	12-Sep-2024 16:25
20240911-GS-C-PCB-3	24I0364-28	Solid	11-Sep-2024 12:50	12-Sep-2024 16:25
20240911-GS-C-TOC-3	24I0364-29	Solid	11-Sep-2024 12:50	12-Sep-2024 16:25
20240911-GS-C-M-3	24I0364-30	Solid	11-Sep-2024 12:50	12-Sep-2024 16:25
20240911-SBT-C-D-1	24I0364-31	Solid	11-Sep-2024 15:10	12-Sep-2024 16:25
20240911-SBT-C-PCB-1	24I0364-33	Solid	11-Sep-2024 15:10	12-Sep-2024 16:25
20240911-SBT-C-TOC-1	24I0364-34	Solid	11-Sep-2024 15:10	12-Sep-2024 16:25
20240911-SBT-C-M-1	24I0364-35	Solid	11-Sep-2024 15:10	12-Sep-2024 16:25
20240911-SBT-C-D-2	24I0364-36	Solid	11-Sep-2024 15:20	12-Sep-2024 16:25
20240911-SBT-C-PCB-2	24I0364-38	Solid	11-Sep-2024 15:20	12-Sep-2024 16:25
20240911-SBT-C-TOC-2	24I0364-39	Solid	11-Sep-2024 15:20	12-Sep-2024 16:25
20240911-SBT-C-M-2	24I0364-40	Solid	11-Sep-2024 15:20	12-Sep-2024 16:25
20240911-SBT-C-D-3	24I0364-41	Solid	11-Sep-2024 15:30	12-Sep-2024 16:25
20240911-SBT-C-PCB-3	24I0364-43	Solid	11-Sep-2024 15:30	12-Sep-2024 16:25
20240911-SBT-C-TOC-3	24I0364-44	Solid	11-Sep-2024 15:30	12-Sep-2024 16:25
20240911-SBT-C-M-3	24I0364-45	Solid	11-Sep-2024 15:30	12-Sep-2024 16:25
20240911-SBT-TAT-D-1	24I0364-46	Solid	11-Sep-2024 16:00	12-Sep-2024 16:25
20240911-SBT-TAT-PCB-1	24I0364-48	Solid	11-Sep-2024 16:00	12-Sep-2024 16:25
20240911-SBT-TAT-TOC-1	24I0364-49	Solid	11-Sep-2024 16:00	12-Sep-2024 16:25

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-1	24I0364-50	Solid	11-Sep-2024 16:00	12-Sep-2024 16:25
20240911-SBT-TAT-D-2	24I0364-51	Solid	11-Sep-2024 16:10	12-Sep-2024 16:25
20240911-SBT-TAT-PCB-2	24I0364-53	Solid	11-Sep-2024 16:10	12-Sep-2024 16:25
20240911-SBT-TAT-TOC-2	24I0364-54	Solid	11-Sep-2024 16:10	12-Sep-2024 16:25
20240911-SBT-TAT-M-2	24I0364-55	Solid	11-Sep-2024 16:10	12-Sep-2024 16:25
20240911-SBT-TAT-D-3	24I0364-56	Solid	11-Sep-2024 16:20	12-Sep-2024 16:25
20240911-SBT-TAT-PCB-3	24I0364-58	Solid	11-Sep-2024 16:20	12-Sep-2024 16:25
20240911-SBT-TAT-TOC-3	24I0364-59	Solid	11-Sep-2024 16:20	12-Sep-2024 16:25
20240911-SBT-TAT-M-3	24I0364-60	Solid	11-Sep-2024 16:20	12-Sep-2024 16:25
20240912-G-CB-Dx/A-1	24I0364-61	Solid	12-Sep-2024 08:35	12-Sep-2024 16:25
20240912-G-CB-TPHG-1	24I0364-62	Solid	12-Sep-2024 08:35	12-Sep-2024 16:25
20240912-G-CB-M-1	24I0364-63	Solid	12-Sep-2024 08:35	12-Sep-2024 16:25
20240912-G-CB-Dx/A-2	24I0364-64	Solid	12-Sep-2024 08:50	12-Sep-2024 16:25
20240912-G-CB-TPHG-2	24I0364-65	Solid	12-Sep-2024 08:50	12-Sep-2024 16:25
20240912-G-CB-M-2	24I0364-66	Solid	12-Sep-2024 08:50	12-Sep-2024 16:25
20240912-G-CB-Dx/A-3	24I0364-67	Solid	12-Sep-2024 09:10	12-Sep-2024 16:25
20240912-G-CB-TPHG-3	24I0364-68	Solid	12-Sep-2024 09:10	12-Sep-2024 16:25
20240912-G-CB-M-3	24I0364-69	Solid	12-Sep-2024 09:10	12-Sep-2024 16:25
20240912-MSG-CB-Dx-1	24I0364-70	Solid	12-Sep-2024 11:15	12-Sep-2024 16:25
20240912-MSG-CB-TPHG-1	24I0364-71	Solid	12-Sep-2024 11:15	12-Sep-2024 16:25
20240912-MSG-CB-M-1	24I0364-72	Solid	12-Sep-2024 11:15	12-Sep-2024 16:25
20240912-MSG-CB-Dx-2	24I0364-73	Solid	12-Sep-2024 11:35	12-Sep-2024 16:25
20240912-MSG-CB-TPHG-2	24I0364-74	Solid	12-Sep-2024 11:35	12-Sep-2024 16:25
20240912-MSG-CB-M-2	24I0364-75	Solid	12-Sep-2024 11:35	12-Sep-2024 16:25
20240912-MSG-CB-Dx-3	24I0364-76	Solid	12-Sep-2024 11:50	12-Sep-2024 16:25
20240912-MSG-CB-TPHG-3	24I0364-77	Solid	12-Sep-2024 11:50	12-Sep-2024 16:25
20240912-MSG-CB-M-3	24I0364-78	Solid	12-Sep-2024 11:50	12-Sep-2024 16:25
20240912-MSG-CB-TOC-3	24I0364-79	Solid	12-Sep-2024 11:50	12-Sep-2024 16:25
20240912-MSG-CB-PCB-1	24I0364-80	Solid	12-Sep-2024 11:15	12-Sep-2024 16:25
20240912-MSG-CB-PCB-2	24I0364-81	Solid	12-Sep-2024 11:35	12-Sep-2024 16:25
20240912-MSG-CB-PCB-3	24I0364-82	Solid	12-Sep-2024 11:50	12-Sep-2024 16:25
20240912-MSG-CB-TOC-1	24I0364-86	Solid	12-Sep-2024 11:15	12-Sep-2024 16:25
20240912-MSG-CB-TOC-2	24I0364-87	Solid	12-Sep-2024 11:35	12-Sep-2024 16:25
20240912-G-CB-TOC-1	24I0364-88	Solid	12-Sep-2024 08:35	12-Sep-2024 16:25
20240912-G-CB-TOC-2	24I0364-89	Solid	12-Sep-2024 08:50	12-Sep-2024 16:25
20240912-G-CB-TOC-3	24I0364-90	Solid	12-Sep-2024 09:10	12-Sep-2024 16:25
20240912-G-CB-PCB-1	24I0364-91	Solid	12-Sep-2024 08:35	12-Sep-2024 16:25
20240912-G-CB-PCB-2	24I0364-92	Solid	12-Sep-2024 08:50	12-Sep-2024 16:25
20240912-G-CB-PCB-3	24I0364-93	Solid	12-Sep-2024 09:10	12-Sep-2024 16:25
Trip Blanks	24I0364-94	Water	11-Sep-2024 11:25	12-Sep-2024 16:25

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Work Order Case Narrative

ent: WSP USA, Inc
Project: Whitmarsh
Work Order 24I0364

Sample receipt

Samples as listed on the preceding page were received September 12, 2024 under ARI work order 24I0364. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Dioxin/Furans - EPA Method 1613

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

The method blank(s) contained OCDD. Samples that contain OCDD have been flagged with a "B" qualifer.

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Gasoline by NWTPH-g (GC/MS)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD)

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements with the exception of aroclor 1260 which failed low on back column for ICV2 in SMJ0003.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits with the exception of surrogates flagged on the associated forms.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as flagged. Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene, Fluoranthene and Indeno(1,2,3-cd)pyrene which were out of control low and Acenaphthylene was out of control high in the initial calibration verification SMI0383-ICV1. Acenaphthylene, Benzyl Alcohol, Butylbenzylphthalate

WSP USA, Inc.	Project:	Whitmarsh	
840 HOWE STREET, #1000	Project Number:	Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager:	Accounts Payable	06-Nov-2024 16:54

and Di-n-Butylphthalate which were out of control high in the initial calibration verification SMI 0411-ICV1. Benzoic acid, Fluoranthene, Pyrene and surrogate p-Terphenyl-d14 which were out of control low and Acenaphthylene was out of control high in initial calibration verification SMI0430-ICV1. All associated samples which contain analyte have been flagged with a "Q" qualifier. Benzo(g,h,i)perylene and surrogate Peylene-d12 which was out of control low and bis(2-Ethylhexyl)phthalate and Butylbenzylphthalate which was out of control high in the continuing calibration verification SMI0383-CCV1. Benzo(g,h,i)perylene, Dibenzo(a,h)anthracene and surrogate Perylene-d12 which were out of control low and Acenaphthylene, bis(2-Ethylhexyl)phthalate and Butylbenzylphthalate was out of control high in the continuing calibration verification SMI0411-CCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except p-Terphenyl-d14 was out of control high as flagged in samples and QC samples.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits except as flagged.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Semivolatiles - EPA Method SW8270E-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except as follows. Pentachlorophenol was out of control low and surrogate p-Terphenyl-d14 was out of control high in the initial calibration verification SMJ0155-ICV1 and SMJ0155-ICV2. Dibenzo(a,h)anthracene, N-Nitrosodiphenylamine, Pentachlorophenol and surrogate Perylene-d12 which were out of control low and Butylbenzylphthalate and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification SMJ0155-ICV3. Dibenzo(a,h)anthracene and Pentachlorophenol were out of control low in the initial calibration verification SMJ0155-ICV4. Hexachlorobenzene was out of control low and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification SMJ0157-ICV1. Hexachlorobenzene was out of control low and Diethyl Phthalate and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification SMJ0157-ICV2. Dibenzo(a,h)anthracene and Hexachlorobenzene were out of control low and surrogate p-Terphenyl-d14 which were out of control high in the initial calibration verification SMJ0157-ICV3. All associated samples which contain analyte have been flagged with a "Q" qualifier. Butylbenzylphthalate and surrogate p-Terphenyl-d14 which were out of control high in the continuing calibration verification SMJ0155-CCV1. Dibenzo(a,h)anthracene and surrogate Perylene-d12 which were out of control low and surrogate p-Terphenyl-d14 was out of control high in the continuing calibration verification SMJ0157-CCV1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except p-Terphenyl-d14 was out of control high as flagged in samples and QC samples.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

The method blank(s) were clean at the reporting limits except Diethyl Phthalate. All associate samples which contain analyte have been flagged with a "B" qualifier.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits except as flagged.

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits except as flagged except as flagged.

SIM runs associated with full-scan runs for the same compounds will not be diluted for over-range results if detected and reported in the full-scan run.

Total Metals - EPA Method 6020B and 7471B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations including interference checks were within method requirements for reported elements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

The reference material (SRM) percent recoveries were within control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The reference material (SRM) percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms. The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: WSP USA

Project Name: Import Material Sampling

COC No(s): _____ (NA)

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____

Assigned ARI Job No: 2410364

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 16:25 2.1 3.3 0.9 ___ ___ ___

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: 64

Cooler Accepted by: SW Date: 9-12-24 Time: 16:25

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	YES	(NO)
How were bottles sealed in plastic bags?	Individually	(Grouped)	Not
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	(NA)	YES	NO
Were all VOC vials free of air bubbles?	NA	(YES)	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	09/04/24	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: KB Date: 09/17/24 Time: 1450 Labels checked by: KB

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-1
24I0364-01 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:25
Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 15:19

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-01 A 01
	Preparation Batch: BMI0462	Sample Size: 15.71 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 63.72
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-01 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-01 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-01 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.411	0.999	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.323	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.357	0.999	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.397	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.665	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.457	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.429	0.999	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.452	0.999	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.648	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.766	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD			1.054-1.426	0.747	0.999	ND	ng/kg	U
1,2,3,7,8,9-HxCDD			1.054-1.426	0.819	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		0.764	0.893-1.208		0.999	**1.74**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.686	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.063	0.893-1.208		2.50	**19.2**	ng/kg	
OCDF		0.951	0.757-1.024		2.50	**3.65**	ng/kg	
OCDD		0.897	0.757-1.024		9.99	**151**	ng/kg	B
Homologue groups								
Total TCDF					0.999	ND	ng/kg	U
Total TCDD					0.999	ND	ng/kg	U
Total PeCDF					0.999	**0.577**	ng/kg	J
Total PeCDD					0.999	ND	ng/kg	U
Total HxCDF					0.999	**1.77**	ng/kg	
Total HxCDD					0.999	ND	ng/kg	U
Total HpCDF					0.999	**4.15**	ng/kg	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-1

24I0364-01 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 15:19

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total HpCDD				0.999	**32.0**	ng/kg	

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):	1.05
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):	0.26
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):	1.05
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):	0.24

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-1

24I0364-01 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 15:19

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.709*	*0.655-0.886*	*24-169 %*	*57.5*	*%*	
13C12-2,3,7,8-TCDD		*0.776*	*0.655-0.886*	*25-164 %*	*59.1*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.426*	*1.318-1.783*	*24-185 %*	*70.0*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.629*	*1.318-1.783*	*21-178 %*	*61.8*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.613*	*1.318-1.783*	*25-181 %*	*59.8*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.537*	*0.434-0.587*	*26-152 %*	*64.6*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.503*	*0.434-0.587*	*26-123 %*	*73.1*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.531*	*0.434-0.587*	*28-136 %*	*69.8*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.517*	*0.434-0.587*	*29-147 %*	*70.9*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.207*	*1.054-1.426*	*32-141 %*	*59.8*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.327*	*1.054-1.426*	*28-130 %*	*67.9*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.455*	*0.374-0.506*	*28-143 %*	*72.0*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.457*	*0.374-0.506*	*26-138 %*	*62.6*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.177*	*0.893-1.208*	*23-140 %*	*76.9*	*%*	
13C12-OCDD		*0.994*	*0.757-1.024*	*17-157 %*	*75.0*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*65.7*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-1

24I0364-01 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 15:19

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-TAT-D-1

24I0364-01 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 11:25

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-01

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**63.72**	%	

Labeled compounds

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 15:54

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-03 A 02

Preparation Batch: BMI0474 — Sample Size: 15.86 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 63.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.8	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.8	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 15:54

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*91.5*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*87.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*108*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*93.0*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*96.9*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*92.3*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*113*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*151*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 11:25

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 20:12

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-03 A 02

Preparation Batch: BMI0474 — Sample Size: 15.86 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 63.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	10.5	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.8	71.2	ug/kg	J
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	17.5	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	11.9	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	11.7	ug/kg	Q, J
Butylbenzylphthalate	85-68-7	1	2.5	5.0	4.8	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*93.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*122*	*%*	*, Q

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 11:25

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 11:54

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-03 A 01
	Preparation Batch: BMI0473	Sample Size: 19.81 g (wet)	Dry Weight:12.51 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 63.17
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-03 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-03 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*91.3*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*94.6*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*107*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*97.1*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 15:23

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-03RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 15.86 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 63.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	49.9	99.8	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	49.9	99.8	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	49.9	99.8	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.8	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	5	49.9	99.8	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.8	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	499	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	49.9	99.8	ND	ug/kg	U
Naphthalene	91-20-3	5	49.9	99.8	ND	ug/kg	U
Benzoic acid	65-85-0	5	499	998	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	49.9	99.8	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	49.9	99.8	ND	ug/kg	U
Acenaphthylene	208-96-8	5	49.9	99.8	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	49.9	99.8	ND	ug/kg	U
Acenaphthene	83-32-9	5	49.9	99.8	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.8	99.8	ND	ug/kg	U
Fluorene	86-73-7	5	99.8	99.8	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	49.9	99.8	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.8	99.8	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	499	ND	ug/kg	U
Phenanthrene	85-01-8	5	49.9	99.8	ND	ug/kg	U
Anthracene	120-12-7	5	49.9	99.8	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	49.9	99.8	ND	ug/kg	U
Fluoranthene	206-44-0	5	49.9	99.8	ND	ug/kg	U
Pyrene	129-00-0	5	49.9	99.8	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	49.9	99.8	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	49.9	99.8	ND	ug/kg	U
Chrysene	218-01-9	5	49.9	99.8	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	49.9	99.8	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	49.9	99.8	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.8	99.8	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.8	99.8	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-1

24I0364-03RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 15:23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.8	99.8	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*94.5*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*91.6*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*98.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*88.2*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*92.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*95.8*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*95.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*112*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-1

24I0364-04 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 11:25

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/23/2024 20:38

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-04 A

Preparation Batch: BMI0526 — Sample Size: 0.0271 g (wet) — Dry Weight:0.02 g

Prepared: 09/20/2024 — Final Volume: 0.0271 mL — % Solids: 61.04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	11.6	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-1

24I0364-04 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 11:25

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-04

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 61.04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	61.04	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-1

24I0364-05 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 11:25

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 18:16

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-05 A 01

Preparation Batch: BMI0484 — Sample Size: 1.047 g (wet) — Dry Weight:0.65 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 61.99

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.06	0.31	3.35	mg/kg	
Cadmium	7440-43-9	20	0.05	0.15	0.18	mg/kg	
Copper	7440-50-8	20	0.54	0.77	32.8	mg/kg	
Zinc	7440-66-6	20	4.5	9.2	82.0	mg/kg	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-1

24I0364-05 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 11:25

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 20:10

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-05 A 01

Preparation Batch: BMI0484 — Sample Size: 1.047 g (wet) — Dry Weight:0.65 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 61.99

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	2.00	3.85	14.9	mg/kg	D
Lead	7439-92-1	20	0.08	0.15	3.20	mg/kg	
Silver	7440-22-4	20	0.03	0.31	0.09	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-1

24I0364-05 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 11:25

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 13:43

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-05 A

Preparation Batch: BMI0650 — Sample Size: 0.238 g (wet) — Dry Weight:0.15 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 61.99

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00712	0.0339	0.0666	mg/kg	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-2

24I0364-06 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:40
Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:08

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-06 A 01
	Preparation Batch: BMI0462	Sample Size: 15.33 g (wet)	Dry Weight:10.02 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 65.33
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-06 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-06 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-06 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.596	0.998	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.537	0.998	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.612	0.998	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.572	0.998	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	1.00	0.998	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.640	0.998	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.570	0.998	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.657	0.998	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.955	0.998	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	1.00	0.998	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.652	1.054-1.426		0.998	**0.943**	ng/kg	EMPC, J
1,2,3,7,8,9-HxCDD			1.054-1.426	1.09	0.998	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.206	0.893-1.208		0.998	**3.49**	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.923	0.998	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.095	0.893-1.208		2.50	**29.4**	ng/kg	
OCDF		0.980	0.757-1.024		2.50	**3.65**	ng/kg	
OCDD		0.924	0.757-1.024		9.98	**199**	ng/kg	B
Homologue groups								
Total TCDF					0.998	ND	ng/kg	U
Total TCDD					0.998	ND	ng/kg	U
Total PeCDF					0.998	**0.645**	ng/kg	J
Total PeCDD					0.998	ND	ng/kg	U
Total HxCDF					0.998	ND	ng/kg	U
Total HxCDD					0.998	ND	ng/kg	U
Total HpCDF					0.998	**3.49**	ng/kg	
Total HpCDD					0.998	**46.5**	ng/kg	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-2

24I0364-06 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					1.63		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					0.48		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					1.58		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					0.39		

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-2

24I0364-06 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.715*	*0.655-0.886*	*24-169 %*	*49.8*	*%*	
13C12-2,3,7,8-TCDD		*0.818*	*0.655-0.886*	*25-164 %*	*57.7*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.572*	*1.318-1.783*	*24-185 %*	*60.5*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.605*	*1.318-1.783*	*21-178 %*	*58.3*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.600*	*1.318-1.783*	*25-181 %*	*59.9*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.495*	*0.434-0.587*	*26-152 %*	*63.7*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.467*	*0.434-0.587*	*26-123 %*	*74.8*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.520*	*0.434-0.587*	*28-136 %*	*62.1*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.566*	*0.434-0.587*	*29-147 %*	*62.9*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.246*	*1.054-1.426*	*32-141 %*	*57.0*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.283*	*1.054-1.426*	*28-130 %*	*63.5*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.446*	*0.374-0.506*	*28-143 %*	*69.8*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.461*	*0.374-0.506*	*26-138 %*	*67.5*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.011*	*0.893-1.208*	*23-140 %*	*76.8*	*%*	
13C12-OCDD		*0.849*	*0.757-1.024*	*17-157 %*	*70.6*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*73.1*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-2

24I0364-06 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-TAT-D-2

24I0364-06 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 11:40

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-06

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**65.33**	%	

Labeled compounds

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 16:34

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-08 A 02

Preparation Batch: BMI0474 — Sample Size: 14.51 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 69.01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	16.1	ug/kg	J
2,4-Dimethylphenol	105-67-9	1	49.9	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 16:34

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*92.8*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*87.4*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*99.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*91.2*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*95.4*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*91.9*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*119*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*145*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 11:40

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 20:50

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-08 A 02

Preparation Batch: BMI0474 — Sample Size: 14.51 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 69.01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	5.0	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	18.1	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	10.4	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	4.2	ug/kg	J
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*89.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*123*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 11:40

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 12:14

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-08 A 01
	Preparation Batch: BMI0473	Sample Size: 18.15 g (wet)	Dry Weight:12.53 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 69.01
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-08 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-08 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*89.4*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*91.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*105*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*90.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 16:03

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-08RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 14.51 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 69.01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	49.9	99.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	49.9	99.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	49.9	99.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	5	49.9	99.9	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	499	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	49.9	99.9	ND	ug/kg	U
Naphthalene	91-20-3	5	49.9	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	499	999	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	49.9	99.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	49.9	99.9	ND	ug/kg	U
Acenaphthylene	208-96-8	5	49.9	99.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	49.9	99.9	ND	ug/kg	U
Acenaphthene	83-32-9	5	49.9	99.9	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.9	99.9	ND	ug/kg	U
Fluorene	86-73-7	5	99.9	99.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	49.9	99.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.9	99.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	499	ND	ug/kg	U
Phenanthrene	85-01-8	5	49.9	99.9	ND	ug/kg	U
Anthracene	120-12-7	5	49.9	99.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	49.9	99.9	ND	ug/kg	U
Fluoranthene	206-44-0	5	49.9	99.9	ND	ug/kg	U
Pyrene	129-00-0	5	49.9	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	49.9	99.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	49.9	99.9	ND	ug/kg	U
Chrysene	218-01-9	5	49.9	99.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	49.9	99.9	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	49.9	99.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.9	99.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.9	99.9	ND	ug/kg	U

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-2

24I0364-08RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 16:03

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.9	99.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*92.1*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*92.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*97.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*87.6*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*91.2*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*90.8*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*91.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*107*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-2

24I0364-09 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 11:40

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/24/2024 03:12

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-09 A

Preparation Batch: BMI0526 — Sample Size: 0.0301 g (wet) — Dry Weight:0.02 g

Prepared: 09/20/2024 — Final Volume: 0.0301 mL — % Solids: 66.90

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	9.58	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-2

24I0364-09 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 11:40

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-09

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 66.90

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	66.90	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-2

24I0364-10 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 11:40

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:08

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-10 A 01

Preparation Batch: BMI0484 — Sample Size: 1.088 g (wet) — Dry Weight:0.73 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 67.51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.27	4.89	mg/kg	
Cadmium	7440-43-9	20	0.04	0.14	0.20	mg/kg	
Copper	7440-50-8	20	0.24	0.68	35.7	mg/kg	
Zinc	7440-66-6	20	4.0	8.2	91.3	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-2

24I0364-10 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 11:40

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 18:52

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-10 A 01

Preparation Batch: BMI0484 — Sample Size: 1.088 g (wet) — Dry Weight:0.73 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 67.51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.77	3.40	16.2	mg/kg	D
Lead	7439-92-1	20	0.07	0.14	3.71	mg/kg	
Silver	7440-22-4	20	0.03	0.27	0.10	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-2

24I0364-10 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 11:40

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 13:55

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-10 A

Preparation Batch: BMI0650 — Sample Size: 0.207 g (wet) — Dry Weight:0.14 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 67.51

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00751	0.0358	0.0183	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-3

24I0364-11 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:55

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:58

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-11 A 01
	Preparation Batch: BMI0462	Sample Size: 15.21 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 65.84
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-11 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-11 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-11 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.414	0.999	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.338	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.430	0.999	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.410	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.590	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.413	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.367	0.999	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.435	0.999	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.576	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.671	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.288	1.054-1.426		0.999	**0.910**	ng/kg	J
1,2,3,7,8,9-HxCDD			1.054-1.426	0.729	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.391	0.893-1.208		0.999	**2.48**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.552	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.022	0.893-1.208		2.50	**25.6**	ng/kg	
OCDF		0.685	0.757-1.024		2.50	**3.07**	ng/kg	EMPC
OCDD		0.873	0.757-1.024		9.99	**171**	ng/kg	B
Homologue groups								
Total TCDF					0.999	ND	ng/kg	U
Total TCDD					0.999	ND	ng/kg	U
Total PeCDF					0.999	ND	ng/kg	U
Total PeCDD					0.999	ND	ng/kg	U
Total HxCDF					0.999	**1.80**	ng/kg	
Total HxCDD					0.999	**0.910**	ng/kg	J
Total HpCDF					0.999	**4.56**	ng/kg	
Total HpCDD					0.999	**25.6**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-3

24I0364-11 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:55

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:58

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					1.14		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					0.42		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					1.13		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					0.40		

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-3

24I0364-11 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:55

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:58

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.763*	*0.655-0.886*	*24-169 %*	*62.5*	*%*	
13C12-2,3,7,8-TCDD		*0.827*	*0.655-0.886*	*25-164 %*	*64.0*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.710*	*1.318-1.783*	*24-185 %*	*68.2*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.633*	*1.318-1.783*	*21-178 %*	*64.2*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.541*	*1.318-1.783*	*25-181 %*	*62.4*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.531*	*0.434-0.587*	*26-152 %*	*84.0*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.503*	*0.434-0.587*	*26-123 %*	*90.8*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.559*	*0.434-0.587*	*28-136 %*	*88.2*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.507*	*0.434-0.587*	*29-147 %*	*79.8*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.287*	*1.054-1.426*	*32-141 %*	*75.5*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.202*	*1.054-1.426*	*28-130 %*	*83.0*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.449*	*0.374-0.506*	*28-143 %*	*78.8*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.434*	*0.374-0.506*	*26-138 %*	*75.7*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*0.951*	*0.893-1.208*	*23-140 %*	*85.2*	*%*	
13C12-OCDD		*1.008*	*0.757-1.024*	*17-157 %*	*94.0*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*72.0*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-D-3

24I0364-11 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 11:55

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 16:58

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-TAT-D-3

24I0364-11 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 11:55

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-11

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**65.84**	%	

Labeled compounds

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:55

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 17:14

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-13 A 02

Preparation Batch: BMI0474 — Sample Size: 14.94 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 66.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	16.3	ug/kg	J
2,4-Dimethylphenol	105-67-9	1	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:55

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 17:14

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*92.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*89.7*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*108*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*94.4*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*99.6*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*97.4*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*118*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*147*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 11:55

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 21:28

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-13 A 02

Preparation Batch: BMI0474 — Sample Size: 14.94 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 66.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	5.8	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	21.1	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	8.1	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*98.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*146*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 11:55

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 12:35

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-13 A 01
	Preparation Batch: BMI0473	Sample Size: 18.69 g (wet)	Dry Weight:12.52 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 66.98
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-13 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-13 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*91.4*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*101*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*107*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*100*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:55

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 16:42

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-13RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 14.94 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 66.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	50.0	99.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	50.0	99.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	50.0	99.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	5	50.0	99.9	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	500	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	50.0	99.9	ND	ug/kg	U
Naphthalene	91-20-3	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	500	999	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	50.0	99.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	50.0	99.9	ND	ug/kg	U
Acenaphthylene	208-96-8	5	50.0	99.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	50.0	99.9	ND	ug/kg	U
Acenaphthene	83-32-9	5	50.0	99.9	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.9	99.9	ND	ug/kg	U
Fluorene	86-73-7	5	99.9	99.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	50.0	99.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.9	99.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	500	ND	ug/kg	U
Phenanthrene	85-01-8	5	50.0	99.9	ND	ug/kg	U
Anthracene	120-12-7	5	50.0	99.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	50.0	99.9	ND	ug/kg	U
Fluoranthene	206-44-0	5	50.0	99.9	ND	ug/kg	U
Pyrene	129-00-0	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	50.0	99.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	50.0	99.9	ND	ug/kg	U
Chrysene	218-01-9	5	50.0	99.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	50.0	99.9	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	50.0	99.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.9	99.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.9	99.9	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 11:55

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 16:42

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.9	99.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*101*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*100*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*109*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*98.2*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*103*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*103*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*101*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*116*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-PCB-3

24I0364-13RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 11:55

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 03:37

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-13RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 14.94 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 66.98

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	12.5	25.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	12.5	25.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	12.5	25.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	250	500	ND	ug/kg	U
2-Methylphenol	95-48-7	5	12.5	25.0	ND	ug/kg	U
4-Methylphenol	106-44-5	5	12.5	25.0	17.8	ug/kg	J, D
2,4-Dimethylphenol	105-67-9	5	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	25.0	25.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	12.5	25.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	12.5	25.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	50.0	99.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	12.5	25.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	12.5	25.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	12.5	25.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	12.5	25.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*102*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*136*	*%*	*, Q

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-3

24I0364-14 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 11:55

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/24/2024 03:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-14 A

Preparation Batch: BMI0526 — Sample Size: 0.0293 g (wet) — Dry Weight:0.02 g

Prepared: 09/20/2024 — Final Volume: 0.0293 mL — % Solids: 64.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	11.8	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-TOC-3

24I0364-14 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 11:55

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-14

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 64.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	64.35	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-3

24I0364-15 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 11:55

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:13

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-15 A 01

Preparation Batch: BMI0484 — Sample Size: 1.031 g (wet) — Dry Weight:0.70 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 67.46

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.29	3.53	mg/kg	
Cadmium	7440-43-9	20	0.04	0.14	0.17	mg/kg	
Copper	7440-50-8	20	0.25	0.72	36.5	mg/kg	
Zinc	7440-66-6	20	4.2	8.6	84.5	mg/kg	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-3

24I0364-15 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 11:55

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 18:58

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-15 A 01

Preparation Batch: BMI0484 — Sample Size: 1.031 g (wet) — Dry Weight:0.70 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 67.46

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.87	3.59	13.9	mg/kg	D
Lead	7439-92-1	20	0.07	0.14	3.26	mg/kg	
Silver	7440-22-4	20	0.03	0.29	0.10	mg/kg	J

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-TAT-M-3

24I0364-15 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 11:55

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 13:57

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-15 A

Preparation Batch: BMI0650 — Sample Size: 0.214 g (wet) — Dry Weight:0.14 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 67.46

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00727	0.0346	0.0256	mg/kg	J

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-1

24I0364-16 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 17:48

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-16 A 01
	Preparation Batch: BMI0462	Sample Size: 20.02 g (wet)	Dry Weight:10.00 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 49.95
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-16 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-16 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-16 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.591	1.00	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.515	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.616	1.00	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.656	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.825	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.794	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.704	1.00	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.766	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	1.09	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	1.13	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.425	1.054-1.426		1.00	**0.790**	ng/kg	J
1,2,3,7,8,9-HxCDD			1.054-1.426	1.22	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.170	0.893-1.208		1.00	**2.69**	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	1.15	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		0.905	0.893-1.208		2.50	**32.5**	ng/kg	
OCDF		1.155	0.757-1.024		2.50	**3.09**	ng/kg	EMPC
OCDD		0.912	0.757-1.024		10.0	**239**	ng/kg	B
Homologue groups								
Total TCDF					1.00	ND	ng/kg	U
Total TCDD					1.00	ND	ng/kg	U
Total PeCDF					1.00	ND	ng/kg	U
Total PeCDD					1.00	ND	ng/kg	U
Total HxCDF					1.00	**2.17**	ng/kg	
Total HxCDD					1.00	**2.22**	ng/kg	
Total HpCDF					1.00	**7.47**	ng/kg	
Total HpCDD					1.00	**54.4**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-1

24I0364-16 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 17:48

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):				1.60			
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):				0.50			
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):				1.60			
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):				0.50			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-1

24I0364-16 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 17:48

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.842*	*0.655-0.886*	*24-169 %*	*44.1*	*%*	
13C12-2,3,7,8-TCDD		*0.864*	*0.655-0.886*	*25-164 %*	*47.2*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.674*	*1.318-1.783*	*24-185 %*	*55.3*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.701*	*1.318-1.783*	*21-178 %*	*51.6*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.756*	*1.318-1.783*	*25-181 %*	*47.0*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.548*	*0.434-0.587*	*26-152 %*	*53.2*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.469*	*0.434-0.587*	*26-123 %*	*64.4*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.499*	*0.434-0.587*	*28-136 %*	*55.4*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.507*	*0.434-0.587*	*29-147 %*	*53.6*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.260*	*1.054-1.426*	*32-141 %*	*48.7*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.256*	*1.054-1.426*	*28-130 %*	*53.9*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.439*	*0.374-0.506*	*28-143 %*	*64.1*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.491*	*0.374-0.506*	*26-138 %*	*57.5*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.114*	*0.893-1.208*	*23-140 %*	*66.3*	*%*	
13C12-OCDD		*0.982*	*0.757-1.024*	*17-157 %*	*61.5*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*77.6*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-1

24I0364-16 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:25

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 17:48

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-C-D-1

24I0364-16 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 12:25

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-16

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**49.95**	%	

Labeled compounds

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 17:54

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-18 A 02

Preparation Batch: BMI0474 — Sample Size: 20.6 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 48.62

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.8	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.8	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 17:54

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*79.0*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*73.2*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*85.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*80.8*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*85.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*81.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*102*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*128*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:25

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 22:06

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-18 A 02

Preparation Batch: BMI0474 — Sample Size: 20.6 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 48.62

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	7.7	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	12.1	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	24.7	ug/kg	B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	9.4	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*84.0*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*143*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 12:25

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 12:56

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-18 A 01
	Preparation Batch: BMI0473	Sample Size: 25.72 g (wet)	Dry Weight:12.51 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 48.62
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-18 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-18 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*92.0*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*94.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*106*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*94.5*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 17:22

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-18RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 20.6 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 48.62

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	49.9	99.8	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	49.9	99.8	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	49.9	99.8	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.8	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	5	49.9	99.8	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.8	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	499	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	49.9	99.8	ND	ug/kg	U
Naphthalene	91-20-3	5	49.9	99.8	ND	ug/kg	U
Benzoic acid	65-85-0	5	499	998	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	49.9	99.8	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	49.9	99.8	ND	ug/kg	U
Acenaphthylene	208-96-8	5	49.9	99.8	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	49.9	99.8	ND	ug/kg	U
Acenaphthene	83-32-9	5	49.9	99.8	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.8	99.8	ND	ug/kg	U
Fluorene	86-73-7	5	99.8	99.8	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	49.9	99.8	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.8	99.8	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	499	ND	ug/kg	U
Phenanthrene	85-01-8	5	49.9	99.8	ND	ug/kg	U
Anthracene	120-12-7	5	49.9	99.8	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	49.9	99.8	ND	ug/kg	U
Fluoranthene	206-44-0	5	49.9	99.8	ND	ug/kg	U
Pyrene	129-00-0	5	49.9	99.8	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	49.9	99.8	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	49.9	99.8	ND	ug/kg	U
Chrysene	218-01-9	5	49.9	99.8	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	49.9	99.8	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	49.9	99.8	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.8	99.8	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.8	99.8	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:25

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 17:22

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.8	99.8	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*88.6*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*85.9*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*93.7*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*87.4*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*94.1*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*92.0*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*83.2*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*104*	*%*	

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-1

24I0364-18RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:25

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 04:15

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-18RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 20.6 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 48.62

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	12.5	25.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	12.5	25.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	12.5	25.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	49.9	99.8	ND	ug/kg	U
Benzoic acid	65-85-0	5	250	499	ND	ug/kg	U
2-Methylphenol	95-48-7	5	12.5	25.0	ND	ug/kg	U
4-Methylphenol	106-44-5	5	12.5	25.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	25.0	25.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	12.5	25.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	12.5	25.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	49.9	99.8	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	12.5	25.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	12.5	25.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	49.9	99.8	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	12.5	25.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	12.5	25.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*86.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*116*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-1

24I0364-19 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 12:25

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/24/2024 04:13

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-19 A

Preparation Batch: BMI0526 — Sample Size: 0.0261 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0261 mL — % Solids: 51.29

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	26.6	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-1

24I0364-19 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 12:25

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-19

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 51.29

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	51.29	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-1

24I0364-20 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 12:25

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:18

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-20 A 01

Preparation Batch: BMI0484 — Sample Size: 1.033 g (wet) — Dry Weight:0.52 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 50.41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.07	0.38	1.51	mg/kg	
Cadmium	7440-43-9	20	0.06	0.19	0.13	mg/kg	J
Copper	7440-50-8	20	0.33	0.96	35.8	mg/kg	
Zinc	7440-66-6	20	5.6	11.5	106	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-1

24I0364-20 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 12:25

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:18

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-20 A 01

Preparation Batch: BMI0484 — Sample Size: 1.033 g (wet) — Dry Weight:0.52 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 50.41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.50	0.96	9.31	mg/kg	
Lead	7439-92-1	20	0.10	0.19	1.37	mg/kg	
Silver	7440-22-4	20	0.04	0.38	0.05	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-1

24I0364-20 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 12:25

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:00

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-20 A

Preparation Batch: BMI0650 — Sample Size: 0.233 g (wet) — Dry Weight:0.12 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 50.41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00894	0.0426	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-2

24I0364-21 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:40
Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 18:37

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-21 A 01
	Preparation Batch: BMI0462	Sample Size: 23.15 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 43.24
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-21 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-21 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-21 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.348	0.999	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.293	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.342	0.999	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.326	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.417	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.377	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.365	0.999	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.475	0.999	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.564	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.653	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		2.161	1.054-1.426		0.999	**1.37**	ng/kg	EMPC
1,2,3,7,8,9-HxCDD			1.054-1.426	0.693	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		0.873	0.893-1.208		0.999	**3.54**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.637	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		0.943	0.893-1.208		2.50	**45.5**	ng/kg	
OCDF		0.843	0.757-1.024		2.50	**3.20**	ng/kg	
OCDD		0.838	0.757-1.024		9.99	**328**	ng/kg	B
Homologue groups								
Total TCDF					0.999	ND	ng/kg	U
Total TCDD					0.999	ND	ng/kg	U
Total PeCDF					0.999	ND	ng/kg	U
Total PeCDD					0.999	ND	ng/kg	U
Total HxCDF					0.999	**2.82**	ng/kg	
Total HxCDD					0.999	ND	ng/kg	U
Total HpCDF					0.999	**6.06**	ng/kg	
Total HpCDD					0.999	**73.3**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-2

24I0364-21 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 18:37

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					1.31		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					0.73		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					1.23		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					0.55		

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-2

24I0364-21 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 18:37

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.805*	*0.655-0.886*	*24-169 %*	*61.6*	*%*	
13C12-2,3,7,8-TCDD		*0.724*	*0.655-0.886*	*25-164 %*	*72.7*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.740*	*1.318-1.783*	*24-185 %*	*76.1*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.601*	*1.318-1.783*	*21-178 %*	*73.4*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.647*	*1.318-1.783*	*25-181 %*	*74.4*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.538*	*0.434-0.587*	*26-152 %*	*78.8*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.500*	*0.434-0.587*	*26-123 %*	*84.2*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.571*	*0.434-0.587*	*28-136 %*	*66.9*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.543*	*0.434-0.587*	*29-147 %*	*80.1*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.247*	*1.054-1.426*	*32-141 %*	*67.1*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.189*	*1.054-1.426*	*28-130 %*	*72.0*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.452*	*0.374-0.506*	*28-143 %*	*84.4*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.471*	*0.374-0.506*	*26-138 %*	*78.4*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.064*	*0.893-1.208*	*23-140 %*	*94.0*	*%*	
13C12-OCDD		*0.989*	*0.757-1.024*	*17-157 %*	*88.5*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*74.3*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-2

24I0364-21 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:40

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 18:37

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-C-D-2

24I0364-21 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 12:40

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-21

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**43.24**	%	

Labeled compounds

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 18:34

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-23 A 02

Preparation Batch: BMI0474 — Sample Size: 22.83 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 18:34

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*87.0*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*79.7*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*99.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*87.3*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*93.8*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*88.5*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*126*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*143*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:40

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 22:44

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-23 A 02

Preparation Batch: BMI0474 — Sample Size: 22.83 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	6.4	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	10.7	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	15.0	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	9.9	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*91.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*147*	*%*	*, Q

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WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 12:40

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 13:17

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-23 A 01
	Preparation Batch: BMI0473	Sample Size: 28.53 g (wet)	Dry Weight:12.51 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 43.84
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-23 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-23 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*87.6*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*95.2*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*97.5*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*92.1*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 18:02

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-23RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 22.83 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	50.0	99.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	50.0	99.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	50.0	99.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	5	50.0	99.9	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	500	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	50.0	99.9	ND	ug/kg	U
Naphthalene	91-20-3	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	500	999	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	50.0	99.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	50.0	99.9	ND	ug/kg	U
Acenaphthylene	208-96-8	5	50.0	99.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	50.0	99.9	ND	ug/kg	U
Acenaphthene	83-32-9	5	50.0	99.9	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.9	99.9	ND	ug/kg	U
Fluorene	86-73-7	5	99.9	99.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	50.0	99.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.9	99.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	500	ND	ug/kg	U
Phenanthrene	85-01-8	5	50.0	99.9	ND	ug/kg	U
Anthracene	120-12-7	5	50.0	99.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	50.0	99.9	ND	ug/kg	U
Fluoranthene	206-44-0	5	50.0	99.9	ND	ug/kg	U
Pyrene	129-00-0	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	50.0	99.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	50.0	99.9	ND	ug/kg	U
Chrysene	218-01-9	5	50.0	99.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	50.0	99.9	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	50.0	99.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.9	99.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.9	99.9	ND	ug/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:40

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 18:02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.9	99.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*90.1*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*88.4*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*95.3*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*86.2*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*92.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*91.8*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*85.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*102*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-2

24I0364-23RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:40

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 04:53

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-23RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 22.83 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	12.5	25.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	12.5	25.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	12.5	25.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	250	500	ND	ug/kg	U
2-Methylphenol	95-48-7	5	12.5	25.0	ND	ug/kg	U
4-Methylphenol	106-44-5	5	12.5	25.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	25.0	25.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	12.5	25.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	12.5	25.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	50.0	99.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	12.5	25.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	12.5	25.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	12.5	25.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	12.5	25.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*90.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*120*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-2

24I0364-24 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 12:40

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 16:29

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-24 A

Preparation Batch: BMI0526 — Sample Size: 0.0257 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0257 mL — % Solids: 45.42

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	34.3	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-2

24I0364-24 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 12:40

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-24

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 45.42

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	45.42	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-2

24I0364-25 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 12:40

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:23

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-25 A 01

Preparation Batch: BMI0484 — Sample Size: 1.015 g (wet) — Dry Weight:0.46 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 45.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.08	0.43	1.70	mg/kg	
Cadmium	7440-43-9	20	0.06	0.22	0.17	mg/kg	J
Copper	7440-50-8	20	0.37	1.08	43.5	mg/kg	
Zinc	7440-66-6	20	6.3	12.9	128	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-2

24I0364-25 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 12:40

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:23

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-25 A 01

Preparation Batch: BMI0484 — Sample Size: 1.015 g (wet) — Dry Weight:0.46 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 45.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.56	1.08	8.87	mg/kg	
Lead	7439-92-1	20	0.11	0.22	1.56	mg/kg	
Silver	7440-22-4	20	0.05	0.43	0.07	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-2

24I0364-25 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 12:40

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:02

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-25 A

Preparation Batch: BMI0650 — Sample Size: 0.249 g (wet) — Dry Weight:0.11 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 45.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00921	0.0438	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-3

24I0364-26 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:50
Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 19:27

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-26 A 01
	Preparation Batch: BMI0462	Sample Size: 20.76 g (wet)	Dry Weight:10.00 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 48.17
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-26 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-26 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-26 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF			0.655-0.886	0.335	1.00	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.321	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.421	1.00	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.425	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.607	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.434	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.418	1.00	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.454	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.569	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.794	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD			1.054-1.426	0.754	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDD			1.054-1.426	0.838	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.273	0.893-1.208		1.00	**2.06**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.923	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.134	0.893-1.208		2.50	**31.8**	ng/kg	
OCDF		0.777	0.757-1.024		2.50	**3.04**	ng/kg	
OCDD		0.957	0.757-1.024		10.0	**216**	ng/kg	B
Homologue groups								
Total TCDF					1.00	ND	ng/kg	U
Total TCDD					1.00	ND	ng/kg	U
Total PeCDF					1.00	ND	ng/kg	U
Total PeCDD					1.00	ND	ng/kg	U
Total HxCDF					1.00	**0.965**	ng/kg	J
Total HxCDD					1.00	**3.30**	ng/kg	
Total HpCDF					1.00	**4.19**	ng/kg	
Total HpCDD					1.00	**51.6**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-3

24I0364-26 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:50

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 19:27

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					1.17		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					0.40		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					1.16		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					0.38		

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-3

24I0364-26 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:50

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 19:27

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.831*	*0.655-0.886*	*24-169 %*	*49.6*	*%*	
13C12-2,3,7,8-TCDD		*0.839*	*0.655-0.886*	*25-164 %*	*52.6*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.671*	*1.318-1.783*	*24-185 %*	*57.3*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.618*	*1.318-1.783*	*21-178 %*	*50.5*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.628*	*1.318-1.783*	*25-181 %*	*51.6*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.535*	*0.434-0.587*	*26-152 %*	*60.4*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.562*	*0.434-0.587*	*26-123 %*	*66.6*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.560*	*0.434-0.587*	*28-136 %*	*59.1*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.516*	*0.434-0.587*	*29-147 %*	*62.9*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.212*	*1.054-1.426*	*32-141 %*	*53.7*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.244*	*1.054-1.426*	*28-130 %*	*60.0*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.475*	*0.374-0.506*	*28-143 %*	*57.9*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.415*	*0.374-0.506*	*26-138 %*	*56.8*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.131*	*0.893-1.208*	*23-140 %*	*61.7*	*%*	
13C12-OCDD		*0.900*	*0.757-1.024*	*17-157 %*	*68.8*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*68.1*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-D-3

24I0364-26 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 12:50

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 19:27

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-GS-C-D-3

24I0364-26 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 12:50

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-26

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**48.17**	%	

Labeled compounds

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 19:13

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-28 A 02

Preparation Batch: BMI0474 — Sample Size: 22.92 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.66

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	19.4	ug/kg	J
Pyrene	129-00-0	1	10.0	20.0	20.5	ug/kg	
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	52.3	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 19:13

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*82.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*75.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*95.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*86.4*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*90.1*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*83.9*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*115*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*139*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:50

Instrument: NT14 Analyst: RJL — Analyzed: 10/11/2024 23:23

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-28 A 02

Preparation Batch: BMI0474 — Sample Size: 22.92 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.66

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	5.0	ug/kg	J
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	8.9	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	7.2	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*88.4*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*160*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 12:50

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 13:37

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-28 A 01
	Preparation Batch: BMI0473	Sample Size: 28.67 g (wet)	Dry Weight:12.52 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 43.66
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-28 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-28 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*89.1*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*90.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*93.8*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*95.3*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 18:41

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-28RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 22.92 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.66

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	50.0	99.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	50.0	99.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	50.0	99.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	5	50.0	99.9	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.9	99.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	250	500	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	50.0	99.9	ND	ug/kg	U
Naphthalene	91-20-3	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	500	999	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	50.0	99.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	50.0	99.9	ND	ug/kg	U
Acenaphthylene	208-96-8	5	50.0	99.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	50.0	99.9	ND	ug/kg	U
Acenaphthene	83-32-9	5	50.0	99.9	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.9	99.9	ND	ug/kg	U
Fluorene	86-73-7	5	99.9	99.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	175	250	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	50.0	99.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.9	99.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	250	500	ND	ug/kg	U
Phenanthrene	85-01-8	5	50.0	99.9	ND	ug/kg	U
Anthracene	120-12-7	5	50.0	99.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	50.0	99.9	ND	ug/kg	U
Fluoranthene	206-44-0	5	50.0	99.9	ND	ug/kg	U
Pyrene	129-00-0	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	50.0	99.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	50.0	99.9	ND	ug/kg	U
Chrysene	218-01-9	5	50.0	99.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	200	250	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	50.0	99.9	ND	ug/kg	U
Benzofluoranthenes, Total		5	150	200	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	50.0	99.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.9	99.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.9	99.9	ND	ug/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 12:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 18:41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.9	99.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*82.8*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*80.1*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*87.8*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*82.8*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*88.0*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*87.6*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*82.0*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*101*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-PCB-3

24I0364-28RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 12:50

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 05:31

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-28RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 22.92 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 43.66

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	12.5	25.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	12.5	25.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	12.5	25.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	50.0	99.9	ND	ug/kg	U
Benzoic acid	65-85-0	5	250	500	ND	ug/kg	U
2-Methylphenol	95-48-7	5	12.5	25.0	ND	ug/kg	U
4-Methylphenol	106-44-5	5	12.5	25.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	25.0	25.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	12.5	25.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	12.5	25.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	50.0	99.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	12.5	25.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	12.5	25.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	50.0	99.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	12.5	25.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	12.5	25.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*90.1*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*120*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-3

24I0364-29 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 12:50

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 18:00

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-29 A

Preparation Batch: BMI0526 — Sample Size: 0.0235 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0235 mL — % Solids: 38.96

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	28.6	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-TOC-3

24I0364-29 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 12:50

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-29

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 38.96

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	38.96	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-3

24I0364-30 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 12:50

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:27

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-30 A 01

Preparation Batch: BMI0484 — Sample Size: 1.014 g (wet) — Dry Weight:0.45 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 44.02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.09	0.45	2.64	mg/kg	
Cadmium	7440-43-9	20	0.07	0.22	0.17	mg/kg	J
Copper	7440-50-8	20	0.39	1.12	44.4	mg/kg	
Zinc	7440-66-6	20	6.5	13.4	135	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-3

24I0364-30 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 12:50

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:27

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-30 A 01

Preparation Batch: BMI0484 — Sample Size: 1.014 g (wet) — Dry Weight:0.45 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 44.02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.58	1.12	14.1	mg/kg	
Lead	7439-92-1	20	0.12	0.22	1.89	mg/kg	
Silver	7440-22-4	20	0.05	0.45	0.08	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-GS-C-M-3

24I0364-30 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 12:50

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:04

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-30 A

Preparation Batch: BMI0650 — Sample Size: 0.22 g (wet) — Dry Weight:0.10 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 44.02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.0108	0.0516	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-1

24I0364-31 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:01

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-31 A 01
	Preparation Batch: BMI0462	Sample Size: 23.29 g (wet)	Dry Weight:10.00 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 42.95
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-31 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-31 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-31 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.911	0.655-0.886		1.00	**1.93**	ng/kg	X, EMPC
2,3,7,8-TCDD			0.655-0.886	0.412	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF		1.329	1.318-1.783		1.00	**0.756**	ng/kg	J
2,3,4,7,8-PeCDF			1.318-1.783	0.722	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	1.05	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF		0.655	1.054-1.426		1.00	**1.01**	ng/kg	EMPC
1,2,3,6,7,8-HxCDF		1.806	1.054-1.426		1.00	**0.933**	ng/kg	EMPC, J
2,3,4,6,7,8-HxCDF			1.054-1.426	0.726	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	1.07	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	1.24	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.387	1.054-1.426		1.00	**15.4**	ng/kg	
1,2,3,7,8,9-HxCDD		1.701	1.054-1.426		1.00	**4.52**	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDF		1.079	0.893-1.208		1.00	**39.2**	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	1.43	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.125	0.893-1.208		2.50	**232**	ng/kg	
OCDF		0.963	0.757-1.024		2.50	**44.9**	ng/kg	
OCDD		0.954	0.757-1.024		10.0	**1280**	ng/kg	B
Homologue groups								
Total TCDF					1.00	**2.52**	ng/kg	
Total TCDD					1.00	**8.78**	ng/kg	
Total PeCDF					1.00	**9.88**	ng/kg	
Total PeCDD					1.00	**1.74**	ng/kg	
Total HxCDF					1.00	**58.5**	ng/kg	
Total HxCDD					1.00	**110**	ng/kg	
Total HpCDF					1.00	**111**	ng/kg	
Total HpCDD					1.00	**413**	ng/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-1

24I0364-31 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					6.51		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					5.51		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					6.09		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					4.67		

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-1

24I0364-31 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.763*	*0.655-0.886*	*24-169 %*	*53.0*	*%*	
13C12-2,3,7,8-TCDD		*0.794*	*0.655-0.886*	*25-164 %*	*57.9*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.615*	*1.318-1.783*	*24-185 %*	*59.5*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.593*	*1.318-1.783*	*21-178 %*	*55.5*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.674*	*1.318-1.783*	*25-181 %*	*55.6*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.535*	*0.434-0.587*	*26-152 %*	*69.1*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.536*	*0.434-0.587*	*26-123 %*	*76.5*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.534*	*0.434-0.587*	*28-136 %*	*71.3*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.586*	*0.434-0.587*	*29-147 %*	*69.6*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.265*	*1.054-1.426*	*32-141 %*	*61.7*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.266*	*1.054-1.426*	*28-130 %*	*71.3*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.396*	*0.374-0.506*	*28-143 %*	*74.5*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.427*	*0.374-0.506*	*26-138 %*	*67.2*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.026*	*0.893-1.208*	*23-140 %*	*72.9*	*%*	
13C12-OCDD		*1.006*	*0.757-1.024*	*17-157 %*	*82.4*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*69.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-1

24I0364-31 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:01

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-C-D-1

24I0364-31 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 15:10

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-31

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**42.95**	%	

Labeled compounds

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 19:53

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-33 A 02

Preparation Batch: BMI0474 — Sample Size: 25.06 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 40.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	33.9	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	105	ug/kg	
2,4-Dimethylphenol	105-67-9	1	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.8	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.8	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	39.8	ug/kg	Q
Pyrene	129-00-0	1	10.0	20.0	27.1	ug/kg	
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	346	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/25/2024 19:53

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*65.6*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*59.5*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*68.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*67.1*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*69.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*64.2*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*98.8*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*163*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:10

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 00:01

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-33 A 02

Preparation Batch: BMI0474 — Sample Size: 25.06 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 40.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	28.6	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	112	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	12.4	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*66.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*199*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 15:10

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 13:58

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-33 A 01
	Preparation Batch: BMI0473	Sample Size: 31.25 g (wet)	Dry Weight:12.50 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 40.00
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-33 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-33 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*89.5*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*95.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*106*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*81.8*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 19:21

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-33RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 25.06 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 40.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	99.8	200	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	99.8	200	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	99.8	200	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	200	200	ND	ug/kg	U
2-Methylphenol	95-48-7	10	99.8	200	ND	ug/kg	U
4-Methylphenol	106-44-5	10	150	200	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	10	499	998	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	99.8	200	ND	ug/kg	U
Naphthalene	91-20-3	10	99.8	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	998	2000	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	99.8	200	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	10	99.8	200	ND	ug/kg	U
Acenaphthylene	208-96-8	10	99.8	200	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	99.8	200	ND	ug/kg	U
Acenaphthene	83-32-9	10	99.8	200	ND	ug/kg	U
Dibenzofuran	132-64-9	10	200	200	ND	ug/kg	U
Fluorene	86-73-7	10	200	200	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	349	499	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	99.8	200	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	200	200	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	499	998	ND	ug/kg	U
Phenanthrene	85-01-8	10	99.8	200	ND	ug/kg	U
Anthracene	120-12-7	10	99.8	200	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	10	99.8	200	ND	ug/kg	U
Fluoranthene	206-44-0	10	99.8	200	ND	ug/kg	U
Pyrene	129-00-0	10	99.8	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	99.8	200	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	10	99.8	200	ND	ug/kg	U
Chrysene	218-01-9	10	99.8	200	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	10	399	499	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	10	99.8	200	ND	ug/kg	U
Benzofluoranthenes, Total		10	299	399	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	10	99.8	200	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	200	200	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	200	200	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 19:21

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	10	200	200	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*66.6*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*64.3*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*71.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*66.6*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*67.3*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*71.2*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*58.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*85.3*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-1

24I0364-33RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:10

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 06:08

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-33RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 25.06 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 40.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	24.9	49.9	27.9	ug/kg	J, D
1,4-Dichlorobenzene	106-46-7	10	24.9	49.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	24.9	49.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	99.8	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	499	998	ND	ug/kg	U
2-Methylphenol	95-48-7	10	24.9	49.9	ND	ug/kg	U
4-Methylphenol	106-44-5	10	24.9	49.9	110	ug/kg	D
2,4-Dimethylphenol	105-67-9	10	99.8	200	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	49.9	49.9	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	24.9	49.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	24.9	49.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	99.8	200	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	24.9	49.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	24.9	49.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	99.8	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	24.9	49.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	24.9	49.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*71.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*98.7*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-1

24I0364-34 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 15:10

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 18:31

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-34 A

Preparation Batch: BMI0526 — Sample Size: 0.0226 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0226 mL — % Solids: 38.83

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	29.7	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-1

24I0364-34 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 15:10

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-34

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 38.83

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	38.83	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-1

24I0364-35 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 15:10

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:32

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-35 A 01

Preparation Batch: BMI0484 — Sample Size: 1.003 g (wet) — Dry Weight:0.39 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 39.36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.10	0.51	1.43	mg/kg	
Cadmium	7440-43-9	20	0.08	0.25	0.31	mg/kg	
Copper	7440-50-8	20	0.44	1.27	31.0	mg/kg	
Zinc	7440-66-6	20	7.4	15.2	158	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-1

24I0364-35 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 15:10

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:32

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-35 A 01

Preparation Batch: BMI0484 — Sample Size: 1.003 g (wet) — Dry Weight:0.39 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 39.36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.66	1.27	10.5	mg/kg	
Lead	7439-92-1	20	0.13	0.25	3.11	mg/kg	
Silver	7440-22-4	20	0.06	0.51	0.06	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-1

24I0364-35 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 15:10

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:11

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-35 A

Preparation Batch: BMI0650 — Sample Size: 0.203 g (wet) — Dry Weight:0.08 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 39.36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.0131	0.0626	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-2

24I0364-36 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:50

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-36 A 01
	Preparation Batch: BMI0462	Sample Size: 19.79 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 50.57
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-36 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-36 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-36 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.847	0.655-0.886		0.999	**1.79**	ng/kg	
2,3,7,8-TCDD			0.655-0.886	0.353	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF		1.508	1.318-1.783		0.999	**0.805**	ng/kg	J
2,3,4,7,8-PeCDF		1.114	1.318-1.783		0.999	**0.860**	ng/kg	EMPC, J
1,2,3,7,8-PeCDD			1.318-1.783	0.680	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDF		0.990	1.054-1.426		0.999	**0.695**	ng/kg	EMPC, J
1,2,3,6,7,8-HxCDF		0.834	1.054-1.426		0.999	**0.650**	ng/kg	EMPC, J
2,3,4,6,7,8-HxCDF		1.220	1.054-1.426		0.999	**1.64**	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.706	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.840	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.215	1.054-1.426		0.999	**10.0**	ng/kg	
1,2,3,7,8,9-HxCDD		1.031	1.054-1.426		0.999	**2.89**	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDF		1.021	0.893-1.208		0.999	**21.1**	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	1.10	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.173	0.893-1.208		2.50	**218**	ng/kg	
OCDF		0.872	0.757-1.024		2.50	**29.2**	ng/kg	
OCDD		0.882	0.757-1.024		9.99	**1240**	ng/kg	B
Homologue groups								
Total TCDF					0.999	**5.70**	ng/kg	
Total TCDD					0.999	**6.18**	ng/kg	
Total PeCDF					0.999	**9.32**	ng/kg	
Total PeCDD					0.999	**4.62**	ng/kg	
Total HxCDF					0.999	**31.3**	ng/kg	
Total HxCDD					0.999	**28.9**	ng/kg	
Total HpCDF					0.999	**61.4**	ng/kg	
Total HpCDD					0.999	**343**	ng/kg	

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-2

24I0364-36 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:50

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					5.42		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					4.82		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					5.08		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					4.14		

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-2

24I0364-36 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:50

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.838*	*0.655-0.886*	*24-169 %*	*74.0*	*%*	
13C12-2,3,7,8-TCDD		*0.860*	*0.655-0.886*	*25-164 %*	*73.6*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.732*	*1.318-1.783*	*24-185 %*	*87.3*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.567*	*1.318-1.783*	*21-178 %*	*79.6*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.640*	*1.318-1.783*	*25-181 %*	*76.9*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.518*	*0.434-0.587*	*26-152 %*	*87.5*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.548*	*0.434-0.587*	*26-123 %*	*93.8*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.513*	*0.434-0.587*	*28-136 %*	*86.8*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.502*	*0.434-0.587*	*29-147 %*	*87.9*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.258*	*1.054-1.426*	*32-141 %*	*74.9*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.244*	*1.054-1.426*	*28-130 %*	*82.7*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.464*	*0.374-0.506*	*28-143 %*	*88.7*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.484*	*0.374-0.506*	*26-138 %*	*89.3*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*0.979*	*0.893-1.208*	*23-140 %*	*99.4*	*%*	
13C12-OCDD		*0.976*	*0.757-1.024*	*17-157 %*	*97.2*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*79.5*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-2

24I0364-36 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 22:50

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-C-D-2

24I0364-36 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 15:20

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-36

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**50.57**	%	

Labeled compounds

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 20:01

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-38 A 02

Preparation Batch: BMI0474 — Sample Size: 20.96 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 47.71

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	22.0	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	76.0	ug/kg	
2,4-Dimethylphenol	105-67-9	1	50.0	100	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	100	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	100	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	21.5	ug/kg	
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	48.2	ug/kg	
Pyrene	129-00-0	1	10.0	20.0	34.2	ug/kg	
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	428	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 20:01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*74.3*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*70.7*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*78.0*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*74.1*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*82.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*78.7*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*98.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*155*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:20

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 00:39

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-38 A 02

Preparation Batch: BMI0474 — Sample Size: 20.96 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 47.71

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	18.7	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	100	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	7.5	ug/kg	
4-Methylphenol	106-44-5	1	2.5	5.0	80.0	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*73.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*207*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 15:20

Instrument: ECD5 Analyst: AA — Analyzed: 09/30/2024 14:19

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-38 A 01
	Preparation Batch: BMI0473	Sample Size: 26.2 g (wet)	Dry Weight:12.50 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 47.71
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-38 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-38 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*92.7*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*120*	*%*	P1
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*106*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*81.2*	*%*	P1

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 16:19

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-38RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 20.96 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 47.71

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	100	200	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	100	200	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	100	200	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	200	200	ND	ug/kg	U
2-Methylphenol	95-48-7	10	100	200	ND	ug/kg	U
4-Methylphenol	106-44-5	10	150	200	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	10	500	1000	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	100	200	ND	ug/kg	U
Naphthalene	91-20-3	10	100	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	1000	2000	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	100	200	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	10	100	200	ND	ug/kg	U
Acenaphthylene	208-96-8	10	100	200	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	100	200	ND	ug/kg	U
Acenaphthene	83-32-9	10	100	200	ND	ug/kg	U
Dibenzofuran	132-64-9	10	200	200	ND	ug/kg	U
Fluorene	86-73-7	10	200	200	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	350	500	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	100	200	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	200	200	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	500	1000	ND	ug/kg	U
Phenanthrene	85-01-8	10	100	200	ND	ug/kg	U
Anthracene	120-12-7	10	100	200	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	10	100	200	ND	ug/kg	U
Fluoranthene	206-44-0	10	100	200	ND	ug/kg	U
Pyrene	129-00-0	10	100	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	100	200	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	10	100	200	ND	ug/kg	U
Chrysene	218-01-9	10	100	200	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	10	400	500	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	10	100	200	ND	ug/kg	U
Benzofluoranthenes, Total		10	300	400	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	10	100	200	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	200	200	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	200	200	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 16:19

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	10	200	200	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*66.6*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*59.5*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*66.8*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*68.9*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*71.0*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*74.9*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*50.2*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*74.8*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-2

24I0364-38RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:20

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 06:46

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-38RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 20.96 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 47.71

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	25.0	50.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	25.0	50.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	25.0	50.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	100	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	500	1000	ND	ug/kg	U
2-Methylphenol	95-48-7	10	25.0	50.0	ND	ug/kg	U
4-Methylphenol	106-44-5	10	25.0	50.0	71.8	ug/kg	D
2,4-Dimethylphenol	105-67-9	10	100	200	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	50.0	50.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	25.0	50.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	25.0	50.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	100	200	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	25.0	50.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	25.0	50.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	100	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	25.0	50.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	25.0	50.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*74.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*100*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-2

24I0364-39 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 15:20

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 19:01

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-39 A

Preparation Batch: BMI0526 — Sample Size: 0.0297 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0297 mL — % Solids: 48.34

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	43.4	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-2

24I0364-39 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 15:20

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-39

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 48.34

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	48.34	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-2

24I0364-40 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 15:20

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:37

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-40 A 01

Preparation Batch: BMI0484 — Sample Size: 1.015 g (wet) — Dry Weight:0.53 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 52.27

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.07	0.38	1.32	mg/kg	
Cadmium	7440-43-9	20	0.06	0.19	0.32	mg/kg	
Copper	7440-50-8	20	0.33	0.94	30.2	mg/kg	
Zinc	7440-66-6	20	1.8	11.3	167	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-2

24I0364-40 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 15:20

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:37

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-40 A 01

Preparation Batch: BMI0484 — Sample Size: 1.015 g (wet) — Dry Weight:0.53 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 52.27

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.45	0.94	12.1	mg/kg	
Lead	7439-92-1	20	0.10	0.19	2.84	mg/kg	
Silver	7440-22-4	20	0.04	0.38	0.07	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-2

24I0364-40 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 15:20

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:14

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-40 A

Preparation Batch: BMI0650 — Sample Size: 0.258 g (wet) — Dry Weight:0.13 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 52.27

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00779	0.0371	0.00905	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-3

24I0364-41 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:30

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 23:40

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-41 A 01
	Preparation Batch: BMI0462	Sample Size: 18.97 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 52.75
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-41 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-41 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-41 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.744	0.655-0.886		0.999	**2.14**	ng/kg	X
2,3,7,8-TCDD			0.655-0.886	0.395	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.929	0.999	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.993	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDD		1.535	1.318-1.783		0.999	**0.681**	ng/kg	J
1,2,3,4,7,8-HxCDF		1.839	1.054-1.426		0.999	**0.754**	ng/kg	EMPC, J
1,2,3,6,7,8-HxCDF		0.866	1.054-1.426		0.999	**0.888**	ng/kg	EMPC, J
2,3,4,6,7,8-HxCDF		1.329	1.054-1.426		0.999	**3.67**	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.918	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.973	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.300	1.054-1.426		0.999	**15.2**	ng/kg	
1,2,3,7,8,9-HxCDD		1.049	1.054-1.426		0.999	**4.65**	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDF		1.080	0.893-1.208		0.999	**41.5**	ng/kg	
1,2,3,4,7,8,9-HpCDF		2.678	0.893-1.208		0.999	**2.05**	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.004	0.893-1.208		2.50	**252**	ng/kg	
OCDF		0.924	0.757-1.024		2.50	**43.2**	ng/kg	
OCDD		0.912	0.757-1.024		9.99	**1310**	ng/kg	B
Homologue groups								
Total TCDF					0.999	**5.46**	ng/kg	
Total TCDD					0.999	**6.72**	ng/kg	
Total PeCDF					0.999	**6.70**	ng/kg	
Total PeCDD					0.999	**0.681**	ng/kg	J
Total HxCDF					0.999	**62.0**	ng/kg	
Total HxCDD					0.999	**115**	ng/kg	
Total HpCDF					0.999	**117**	ng/kg	
Total HpCDD					0.999	**415**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-3

24I0364-41 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:30

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 23:40

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					7.23		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					6.77		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					6.90		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					6.12		

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-3

24I0364-41 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:30

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 23:40

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.859*	*0.655-0.886*	*24-169 %*	*61.0*	*%*	
13C12-2,3,7,8-TCDD		*0.774*	*0.655-0.886*	*25-164 %*	*62.1*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.443*	*1.318-1.783*	*24-185 %*	*73.8*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.454*	*1.318-1.783*	*21-178 %*	*69.5*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.625*	*1.318-1.783*	*25-181 %*	*70.4*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.525*	*0.434-0.587*	*26-152 %*	*77.6*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.512*	*0.434-0.587*	*26-123 %*	*78.5*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.549*	*0.434-0.587*	*28-136 %*	*73.5*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.506*	*0.434-0.587*	*29-147 %*	*80.5*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.294*	*1.054-1.426*	*32-141 %*	*67.9*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.184*	*1.054-1.426*	*28-130 %*	*70.1*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.495*	*0.374-0.506*	*28-143 %*	*69.4*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.487*	*0.374-0.506*	*26-138 %*	*74.3*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.083*	*0.893-1.208*	*23-140 %*	*81.6*	*%*	
13C12-OCDD		*0.903*	*0.757-1.024*	*17-157 %*	*75.2*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*69.7*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-D-3

24I0364-41 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 15:30

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/01/2024 23:40

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-C-D-3

24I0364-41 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 15:30

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-41

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**52.75**	%	

Labeled compounds

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:30

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 20:40

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-43 A 02

Preparation Batch: BMI0474 — Sample Size: 18.9 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 53.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	41.9	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	184	ug/kg	
2,4-Dimethylphenol	105-67-9	1	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.8	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.8	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	26.1	ug/kg	
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	61.2	ug/kg	
Pyrene	129-00-0	1	10.0	20.0	39.8	ug/kg	
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	481	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:30

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 20:40

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*73.3*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*68.3*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*77.7*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*73.3*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*74.9*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*72.2*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*92.4*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*166*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:30

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 01:17

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-43 A 02

Preparation Batch: BMI0474 — Sample Size: 18.9 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 53.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	38.6	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	190	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	15.1	ug/kg	
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*73.4*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*250*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 15:30

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 20:04

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-43 A 01
	Preparation Batch: BMI0473	Sample Size: 23.29 g (wet)	Dry Weight:12.34 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 53.00
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-43 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-43 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.1	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.1	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.1	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.1	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.1	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.1	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.1	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.1	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.1	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*89.8*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*104*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*108*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*84.2*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:30

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 16:59

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-43RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 18.9 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 53.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	99.8	200	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	99.8	200	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	99.8	200	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	200	200	ND	ug/kg	U
2-Methylphenol	95-48-7	10	99.8	200	ND	ug/kg	U
4-Methylphenol	106-44-5	10	150	200	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	10	499	998	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	99.8	200	ND	ug/kg	U
Naphthalene	91-20-3	10	99.8	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	998	2000	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	99.8	200	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	10	99.8	200	ND	ug/kg	U
Acenaphthylene	208-96-8	10	99.8	200	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	99.8	200	ND	ug/kg	U
Acenaphthene	83-32-9	10	99.8	200	ND	ug/kg	U
Dibenzofuran	132-64-9	10	200	200	ND	ug/kg	U
Fluorene	86-73-7	10	200	200	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	349	499	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	99.8	200	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	200	200	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	499	998	ND	ug/kg	U
Phenanthrene	85-01-8	10	99.8	200	ND	ug/kg	U
Anthracene	120-12-7	10	99.8	200	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	10	99.8	200	ND	ug/kg	U
Fluoranthene	206-44-0	10	99.8	200	ND	ug/kg	U
Pyrene	129-00-0	10	99.8	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	99.8	200	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	10	99.8	200	ND	ug/kg	U
Chrysene	218-01-9	10	99.8	200	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	10	399	499	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	10	99.8	200	ND	ug/kg	U
Benzofluoranthenes, Total		10	299	399	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	10	99.8	200	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	200	200	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	200	200	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 15:30

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 16:59

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	10	200	200	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*65.2*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*56.0*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*65.6*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*70.1*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*69.9*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*73.7*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*56.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*70.8*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-PCB-3

24I0364-43RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 15:30

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 07:24

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-43RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 18.9 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 53.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	25.0	49.9	35.2	ug/kg	J, D
1,4-Dichlorobenzene	106-46-7	10	25.0	49.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	25.0	49.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	99.8	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	499	998	ND	ug/kg	U
2-Methylphenol	95-48-7	10	25.0	49.9	ND	ug/kg	U
4-Methylphenol	106-44-5	10	25.0	49.9	172	ug/kg	D
2,4-Dimethylphenol	105-67-9	10	99.8	200	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	49.9	49.9	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	25.0	49.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	25.0	49.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	99.8	200	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	25.0	49.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	25.0	49.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	99.8	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	25.0	49.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	25.0	49.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*72.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*99.0*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-3

24I0364-44 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 15:30

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 19:32

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-44 A

Preparation Batch: BMI0526 — Sample Size: 0.0239 g (wet) — Dry Weight:0.01 g

Prepared: 09/20/2024 — Final Volume: 0.0239 mL — % Solids: 52.88

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	40.0	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-TOC-3

24I0364-44 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 15:30

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-44

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 52.88

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	52.88	%	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-3

24I0364-45 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 15:30

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:42

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-45 A 01

Preparation Batch: BMI0484 — Sample Size: 1.062 g (wet) — Dry Weight:0.67 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 62.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.06	0.30	1.55	mg/kg	
Cadmium	7440-43-9	20	0.05	0.15	0.85	mg/kg	
Copper	7440-50-8	20	0.26	0.75	32.6	mg/kg	
Zinc	7440-66-6	20	1.4	9.0	219	mg/kg	

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Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-3

24I0364-45 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 15:30

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 20:42

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-45 A 01

Preparation Batch: BMI0484 — Sample Size: 1.062 g (wet) — Dry Weight:0.67 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 62.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	20	0.39	0.75	11.4	mg/kg	
Lead	7439-92-1	20	0.08	0.15	3.05	mg/kg	
Silver	7440-22-4	20	0.03	0.30	0.08	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-C-M-3

24I0364-45 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 15:30

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:16

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-45 A

Preparation Batch: BMI0650 — Sample Size: 0.205 g (wet) — Dry Weight:0.13 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 62.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00816	0.0389	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-1

24I0364-46 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:00

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 00:29

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-46 A 01
	Preparation Batch: BMI0462	Sample Size: 13.2 g (wet)	Dry Weight:10.00 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 75.78
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-46 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-46 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-46 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.736	0.655-0.886		1.00	**0.598**	ng/kg	X, J
2,3,7,8-TCDD			0.655-0.886	0.611	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.573	1.00	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.546	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.843	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.528	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.515	1.00	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.590	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.856	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.938	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.182	1.054-1.426		1.00	**7.45**	ng/kg	
1,2,3,7,8,9-HxCDD			1.054-1.426	0.977	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.265	0.893-1.208		1.00	**20.8**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF			0.893-1.208	1.54	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		0.919	0.893-1.208		2.50	**61.8**	ng/kg	
OCDF		0.861	0.757-1.024		2.50	**28.7**	ng/kg	
OCDD		0.982	0.757-1.024		10.0	**421**	ng/kg	B
Homologue groups								
Total TCDF					1.00	**0.598**	ng/kg	J
Total TCDD					1.00	**1.52**	ng/kg	
Total PeCDF					1.00	**3.85**	ng/kg	
Total PeCDD					1.00	**1.58**	ng/kg	
Total HxCDF					1.00	**21.5**	ng/kg	
Total HxCDD					1.00	**48.7**	ng/kg	
Total HpCDF					1.00	**30.7**	ng/kg	
Total HpCDD					1.00	**103**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-1

24I0364-46 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:00

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 00:29

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					2.81		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					1.77		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					2.71		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					1.56		

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-1

24I0364-46 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:00

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 00:29

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.795*	*0.655-0.886*	*24-169 %*	*41.4*	*%*	
13C12-2,3,7,8-TCDD		*0.833*	*0.655-0.886*	*25-164 %*	*41.1*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.724*	*1.318-1.783*	*24-185 %*	*46.0*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.569*	*1.318-1.783*	*21-178 %*	*45.3*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.698*	*1.318-1.783*	*25-181 %*	*46.7*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.532*	*0.434-0.587*	*26-152 %*	*57.6*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.517*	*0.434-0.587*	*26-123 %*	*60.3*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.529*	*0.434-0.587*	*28-136 %*	*55.7*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.540*	*0.434-0.587*	*29-147 %*	*52.7*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.195*	*1.054-1.426*	*32-141 %*	*49.5*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.214*	*1.054-1.426*	*28-130 %*	*54.1*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.419*	*0.374-0.506*	*28-143 %*	*51.0*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.441*	*0.374-0.506*	*26-138 %*	*45.7*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.074*	*0.893-1.208*	*23-140 %*	*57.5*	*%*	
13C12-OCDD		*0.967*	*0.757-1.024*	*17-157 %*	*58.6*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*61.0*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-1

24I0364-46 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:00

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 00:29

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-TAT-D-1

24I0364-46 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 16:00

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-46

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**75.78**	%	

Labeled compounds

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:00

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 21:20

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-48 A 02

Preparation Batch: BMI0474 — Sample Size: 13.1 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 76.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	31.3	ug/kg	
2,4-Dimethylphenol	105-67-9	1	49.9	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	19.7	ug/kg	J
Pyrene	129-00-0	1	10.0	20.0	25.4	ug/kg	
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	49.9	129	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:00

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 21:20

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*90.1*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*86.9*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*97.6*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*91.3*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*91.0*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*94.1*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*103*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*171*	*%*	*

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 16:00

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 01:55

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-48 A 02

Preparation Batch: BMI0474 — Sample Size: 13.1 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 76.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	5.2	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	30.5	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*88.8*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*268*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 16:00

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 20:25

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-48 A 01
	Preparation Batch: BMI0473	Sample Size: 16.41 g (wet)	Dry Weight:12.54 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 76.43
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-48 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-48 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*99.0*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*93.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*109*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*91.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:00

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 17:39

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-48RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 13.1 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 76.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	99.9	200	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	99.9	200	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	99.9	200	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	200	200	ND	ug/kg	U
2-Methylphenol	95-48-7	10	99.9	200	ND	ug/kg	U
4-Methylphenol	106-44-5	10	150	200	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	10	499	999	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	99.9	200	ND	ug/kg	U
Naphthalene	91-20-3	10	99.9	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	999	2000	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	99.9	200	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	10	99.9	200	ND	ug/kg	U
Acenaphthylene	208-96-8	10	99.9	200	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	99.9	200	ND	ug/kg	U
Acenaphthene	83-32-9	10	99.9	200	ND	ug/kg	U
Dibenzofuran	132-64-9	10	200	200	ND	ug/kg	U
Fluorene	86-73-7	10	200	200	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	350	499	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	99.9	200	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	200	200	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	499	999	ND	ug/kg	U
Phenanthrene	85-01-8	10	99.9	200	ND	ug/kg	U
Anthracene	120-12-7	10	99.9	200	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	10	99.9	200	ND	ug/kg	U
Fluoranthene	206-44-0	10	99.9	200	ND	ug/kg	U
Pyrene	129-00-0	10	99.9	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	99.9	200	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	10	99.9	200	ND	ug/kg	U
Chrysene	218-01-9	10	99.9	200	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	10	400	499	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	10	99.9	200	ND	ug/kg	U
Benzofluoranthenes, Total		10	300	400	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	10	99.9	200	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	10	200	200	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	200	200	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:00

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 17:39

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	10	200	200	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*86.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*74.1*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*84.2*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*86.7*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*87.0*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*94.9*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*68.4*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*86.5*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-1

24I0364-48RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 16:00

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 08:02

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-48RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 13.1 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 76.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	10	25.0	49.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	10	25.0	49.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	10	25.0	49.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	10	99.9	200	ND	ug/kg	U
Benzoic acid	65-85-0	10	499	999	ND	ug/kg	U
2-Methylphenol	95-48-7	10	25.0	49.9	ND	ug/kg	U
4-Methylphenol	106-44-5	10	25.0	49.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	10	99.9	200	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	10	49.9	49.9	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	10	25.0	49.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	10	25.0	49.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	10	99.9	200	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	10	25.0	49.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	10	25.0	49.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	10	99.9	200	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	10	25.0	49.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	10	25.0	49.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*87.2*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*116*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-1

24I0364-49 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 16:00

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 20:02

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-49 A

Preparation Batch: BMI0526 — Sample Size: 0.0491 g (wet) — Dry Weight:0.04 g

Prepared: 09/20/2024 — Final Volume: 0.0491 mL — % Solids: 77.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	6.62	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-1

24I0364-49 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 16:00

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-49

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 77.43

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	77.43	%	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-1

24I0364-50 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 16:00

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:22

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-50 A 01

Preparation Batch: BMI0484 — Sample Size: 1.009 g (wet) — Dry Weight:0.75 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 74.20

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.27	2.65	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.13	mg/kg	J
Copper	7440-50-8	20	0.23	0.67	21.1	mg/kg	
Zinc	7440-66-6	20	3.9	8.0	55.5	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-1

24I0364-50 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 16:00

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:02

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-50 A 01

Preparation Batch: BMI0484 — Sample Size: 1.009 g (wet) — Dry Weight:0.75 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 74.20

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.74	3.34	22.6	mg/kg	D
Lead	7439-92-1	20	0.07	0.13	3.59	mg/kg	
Silver	7440-22-4	20	0.03	0.27	0.07	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-1

24I0364-50 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 16:00

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:18

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-50 A

Preparation Batch: BMI0650 — Sample Size: 0.28 g (wet) — Dry Weight:0.21 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 74.20

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00505	0.0241	0.0207	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-2

24I0364-51 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 01:18

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-51 A 01
	Preparation Batch: BMI0462	Sample Size: 13.52 g (wet)	Dry Weight:10.00 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 73.96
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-51 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-51 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-51 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.501	0.655-0.886		1.00	**1.54**	ng/kg	X, EMPC
2,3,7,8-TCDD			0.655-0.886	0.312	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.545	1.00	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.546	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.909	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF		0.707	1.054-1.426		1.00	**1.54**	ng/kg	EMPC
1,2,3,6,7,8-HxCDF		1.138	1.054-1.426		1.00	**1.39**	ng/kg	
2,3,4,6,7,8-HxCDF		1.309	1.054-1.426		1.00	**3.82**	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.831	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	1.07	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.194	1.054-1.426		1.00	**26.0**	ng/kg	
1,2,3,7,8,9-HxCDD		1.321	1.054-1.426		1.00	**7.67**	ng/kg	
1,2,3,4,6,7,8-HpCDF		1.271	0.893-1.208		1.00	**85.4**	ng/kg	EMPC
1,2,3,4,7,8,9-HpCDF		0.961	0.893-1.208		1.00	**2.51**	ng/kg	
1,2,3,4,6,7,8-HpCDD		0.958	0.893-1.208		2.50	**217**	ng/kg	
OCDF		0.952	0.757-1.024		2.50	**85.4**	ng/kg	
OCDD		0.898	0.757-1.024		10.0	**1300**	ng/kg	B
Homologue groups								
Total TCDF					1.00	**1.26**	ng/kg	
Total TCDD					1.00	**0.787**	ng/kg	J
Total PeCDF					1.00	**7.78**	ng/kg	
Total PeCDD					1.00	**24.7**	ng/kg	
Total HxCDF					1.00	**69.5**	ng/kg	
Total HxCDD					1.00	**179**	ng/kg	
Total HpCDF					1.00	**141**	ng/kg	
Total HpCDD					1.00	**356**	ng/kg	

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-2

24I0364-51 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 01:18

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					8.46		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					7.66		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					7.88		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					6.50		

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-2

24I0364-51 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 01:18

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.685*	*0.655-0.886*	*24-169 %*	*51.7*	*%*	
13C12-2,3,7,8-TCDD		*0.786*	*0.655-0.886*	*25-164 %*	*52.9*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.700*	*1.318-1.783*	*24-185 %*	*55.7*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.747*	*1.318-1.783*	*21-178 %*	*53.4*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.680*	*1.318-1.783*	*25-181 %*	*53.0*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.546*	*0.434-0.587*	*26-152 %*	*61.4*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.553*	*0.434-0.587*	*26-123 %*	*64.9*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.516*	*0.434-0.587*	*28-136 %*	*61.8*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.536*	*0.434-0.587*	*29-147 %*	*69.0*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.216*	*1.054-1.426*	*32-141 %*	*54.0*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.218*	*1.054-1.426*	*28-130 %*	*60.9*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.420*	*0.374-0.506*	*28-143 %*	*67.0*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.448*	*0.374-0.506*	*26-138 %*	*61.9*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.047*	*0.893-1.208*	*23-140 %*	*60.5*	*%*	
13C12-OCDD		*0.967*	*0.757-1.024*	*17-157 %*	*71.8*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*73.0*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-2

24I0364-51 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:10

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 01:18

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-TAT-D-2

24I0364-51 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 16:10

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-51

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**73.96**	%	

Labeled compounds

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 22:00

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-53 A 02

Preparation Batch: BMI0474 — Sample Size: 13.52 g (wet) — Dry Weight:10.05 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 74.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	9.9	19.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	9.9	19.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	9.9	19.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	19.9	19.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	9.9	19.9	ND	ug/kg	U
4-Methylphenol	106-44-5	1	14.9	19.9	52.5	ug/kg	
2,4-Dimethylphenol	105-67-9	1	49.7	99.5	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	9.9	19.9	ND	ug/kg	U
Naphthalene	91-20-3	1	9.9	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.5	199	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	9.9	19.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	9.9	19.9	ND	ug/kg	U
Acenaphthylene	208-96-8	1	9.9	19.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	9.9	19.9	ND	ug/kg	U
Acenaphthene	83-32-9	1	9.9	19.9	ND	ug/kg	U
Dibenzofuran	132-64-9	1	19.9	19.9	ND	ug/kg	U
Fluorene	86-73-7	1	19.9	19.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.8	49.7	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	9.9	19.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	19.9	19.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.7	99.5	ND	ug/kg	U
Phenanthrene	85-01-8	1	9.9	19.9	ND	ug/kg	U
Anthracene	120-12-7	1	9.9	19.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	9.9	19.9	ND	ug/kg	U
Fluoranthene	206-44-0	1	9.9	19.9	22.8	ug/kg	
Pyrene	129-00-0	1	9.9	19.9	27.0	ug/kg	
Butylbenzylphthalate	85-68-7	1	9.9	19.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	9.9	19.9	ND	ug/kg	U
Chrysene	218-01-9	1	9.9	19.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.8	49.7	103	ug/kg	
Di-n-Octylphthalate	117-84-0	1	9.9	19.9	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.8	39.8	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	9.9	19.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	19.9	19.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	19.9	19.9	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/26/2024 22:00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	19.9	19.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*86.4*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*82.9*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*93.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*85.7*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*86.6*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*88.6*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*106*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*173*	*%*	*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 16:10

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 04:26

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-53 A 02

Preparation Batch: BMI0474 — Sample Size: 13.52 g (wet) — Dry Weight:10.05 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 74.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	5.4	ug/kg	
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	9.9	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.7	99.5	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	45.0	ug/kg	
2,4-Dimethylphenol	105-67-9	1	9.9	19.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	9.9	19.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	9.9	19.9	11.4	ug/kg	Q, J
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*80.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*237*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 16:10

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 20:45

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-53 A 01
	Preparation Batch: BMI0473	Sample Size: 16.88 g (wet)	Dry Weight:12.55 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 74.35
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-53 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-53 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*92.0*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*84.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*103*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*87.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 18:19

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-53RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 13.52 g (wet) — Dry Weight:10.05 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 74.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	49.7	99.5	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	49.7	99.5	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	49.7	99.5	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	99.5	99.5	ND	ug/kg	U
2-Methylphenol	95-48-7	5	49.7	99.5	ND	ug/kg	U
4-Methylphenol	106-44-5	5	74.6	99.5	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	5	249	497	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	49.7	99.5	ND	ug/kg	U
Naphthalene	91-20-3	5	49.7	99.5	ND	ug/kg	U
Benzoic acid	65-85-0	5	497	995	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	49.7	99.5	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	5	49.7	99.5	ND	ug/kg	U
Acenaphthylene	208-96-8	5	49.7	99.5	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	49.7	99.5	ND	ug/kg	U
Acenaphthene	83-32-9	5	49.7	99.5	ND	ug/kg	U
Dibenzofuran	132-64-9	5	99.5	99.5	ND	ug/kg	U
Fluorene	86-73-7	5	99.5	99.5	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	174	249	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	49.7	99.5	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	99.5	99.5	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	249	497	ND	ug/kg	U
Phenanthrene	85-01-8	5	49.7	99.5	ND	ug/kg	U
Anthracene	120-12-7	5	49.7	99.5	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	5	49.7	99.5	ND	ug/kg	U
Fluoranthene	206-44-0	5	49.7	99.5	ND	ug/kg	U
Pyrene	129-00-0	5	49.7	99.5	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	49.7	99.5	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	5	49.7	99.5	ND	ug/kg	U
Chrysene	218-01-9	5	49.7	99.5	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	5	199	249	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	5	49.7	99.5	ND	ug/kg	U
Benzofluoranthenes, Total		5	149	199	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	5	49.7	99.5	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	5	99.5	99.5	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	99.5	99.5	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53RE1 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 18:19

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	5	99.5	99.5	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*79.0*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*71.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*80.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*82.0*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*83.5*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*88.6*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*76.7*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*89.8*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-2

24I0364-53RE1 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 16:10

Instrument: NT14 Analyst: RJL — Analyzed: 10/13/2024 08:40

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-53RE1 A 02

Preparation Batch: BMI0474 — Sample Size: 13.52 g (wet) — Dry Weight:10.05 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 74.35

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	5	12.4	24.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	5	12.4	24.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	5	12.4	24.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	5	49.7	99.5	ND	ug/kg	U
Benzoic acid	65-85-0	5	249	497	ND	ug/kg	U
2-Methylphenol	95-48-7	5	12.4	24.9	ND	ug/kg	U
4-Methylphenol	106-44-5	5	12.4	24.9	47.8	ug/kg	D
2,4-Dimethylphenol	105-67-9	5	49.7	99.5	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	5	24.9	24.9	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	5	12.4	24.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	5	12.4	24.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	5	49.7	99.5	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	5	12.4	24.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	5	12.4	24.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	5	49.7	99.5	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	5	12.4	24.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	5	12.4	24.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*85.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*113*	*%*	Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-2

24I0364-54 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 16:10

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 20:33

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-54 A

Preparation Batch: BMI0526 — Sample Size: 0.0372 g (wet) — Dry Weight:0.02 g

Prepared: 09/20/2024 — Final Volume: 0.0372 mL — % Solids: 66.38

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	9.15	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-2

24I0364-54 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 16:10

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-54

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 66.38

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	66.38	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-2

24I0364-55 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 16:10

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:26

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-55 A 01

Preparation Batch: BMI0484 — Sample Size: 1.033 g (wet) — Dry Weight:0.74 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 71.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.27	2.58	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.20	mg/kg	
Copper	7440-50-8	20	0.23	0.67	20.9	mg/kg	
Zinc	7440-66-6	20	3.9	8.1	62.9	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-2

24I0364-55 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 16:10

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:07

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-55 A 01

Preparation Batch: BMI0484 — Sample Size: 1.033 g (wet) — Dry Weight:0.74 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 71.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.75	3.37	19.1	mg/kg	D
Lead	7439-92-1	20	0.07	0.13	3.63	mg/kg	
Silver	7440-22-4	20	0.03	0.27	0.08	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-2

24I0364-55 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 16:10

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:21

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-55 A

Preparation Batch: BMI0650 — Sample Size: 0.257 g (wet) — Dry Weight:0.18 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 71.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00569	0.0271	0.0431	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-3

24I0364-56 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 02:08

Sample Preparation:	Preparation Method: EPA 1613		Extract ID: 24I0364-56 A 01
	Preparation Batch: BMI0462	Sample Size: 13.57 g (wet)	Dry Weight:10.01 g
	Prepared: 10/09/2024	Final Volume: 20 uL	% Solids: 73.78
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 24I0364-56 A 01
	Cleanup Batch: CMJ0076	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-56 A 01
	Cleanup Batch: CMJ0075	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	
Sample Cleanup:	Cleanup Method: Florisil		Extract ID:24I0364-56 A 01
	Cleanup Batch: CMJ0077	Initial Volume: 20 uL	
	Cleaned: 11-Oct-2024	Final Volume: 20 uL	

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes
2,3,7,8-TCDF		0.782	0.655-0.886		0.999	**0.444**	ng/kg	J
2,3,7,8-TCDD			0.655-0.886	0.264	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.390	0.999	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.418	0.999	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.815	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.457	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.444	0.999	ND	ng/kg	U
2,3,4,6,7,8-HxCDF		1.709	1.054-1.426		0.999	**1.49**	ng/kg	EMPC
1,2,3,7,8,9-HxCDF			1.054-1.426	0.661	0.999	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.675	0.999	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		1.295	1.054-1.426		0.999	**7.18**	ng/kg	
1,2,3,7,8,9-HxCDD		1.285	1.054-1.426		0.999	**2.29**	ng/kg	
1,2,3,4,6,7,8-HpCDF		1.164	0.893-1.208		0.999	**22.2**	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.827	0.999	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.183	0.893-1.208		2.50	**63.7**	ng/kg	
OCDF		0.894	0.757-1.024		2.50	**29.0**	ng/kg	
OCDD		0.862	0.757-1.024		9.99	**439**	ng/kg	B
Homologue groups								
Total TCDF					0.999	**0.444**	ng/kg	J
Total TCDD					0.999	ND	ng/kg	U
Total PeCDF					0.999	ND	ng/kg	U
Total PeCDD					0.999	**2.42**	ng/kg	
Total HxCDF					0.999	**22.4**	ng/kg	
Total HxCDD					0.999	**49.7**	ng/kg	
Total HpCDF					0.999	**58.1**	ng/kg	
Total HpCDD					0.999	**103**	ng/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-3

24I0364-56 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 02:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					2.86		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					2.14		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					2.79		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					1.99		

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-3

24I0364-56 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 02:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Labeled compounds							
13C12-2,3,7,8-TCDF		*0.672*	*0.655-0.886*	*24-169 %*	*54.4*	*%*	
13C12-2,3,7,8-TCDD		*0.817*	*0.655-0.886*	*25-164 %*	*55.5*	*%*	
13C12-1,2,3,7,8-PeCDF		*1.589*	*1.318-1.783*	*24-185 %*	*73.4*	*%*	
13C12-2,3,4,7,8-PeCDF		*1.636*	*1.318-1.783*	*21-178 %*	*60.9*	*%*	
13C12-1,2,3,7,8-PeCDD		*1.598*	*1.318-1.783*	*25-181 %*	*61.9*	*%*	
13C12-1,2,3,4,7,8-HxCDF		*0.525*	*0.434-0.587*	*26-152 %*	*70.3*	*%*	
13C12-1,2,3,6,7,8-HxCDF		*0.500*	*0.434-0.587*	*26-123 %*	*70.7*	*%*	
13C12-2,3,4,6,7,8-HxCDF		*0.533*	*0.434-0.587*	*28-136 %*	*71.2*	*%*	
13C12-1,2,3,7,8,9-HxCDF		*0.507*	*0.434-0.587*	*29-147 %*	*68.9*	*%*	
13C12-1,2,3,4,7,8-HxCDD		*1.246*	*1.054-1.426*	*32-141 %*	*61.9*	*%*	
13C12-1,2,3,6,7,8-HxCDD		*1.265*	*1.054-1.426*	*28-130 %*	*65.6*	*%*	
13C12-1,2,3,4,6,7,8-HpCDF		*0.485*	*0.374-0.506*	*28-143 %*	*73.6*	*%*	
13C12-1,2,3,4,7,8,9-HpCDF		*0.402*	*0.374-0.506*	*26-138 %*	*81.8*	*%*	
13C12-1,2,3,4,6,7,8-HpCDD		*1.096*	*0.893-1.208*	*23-140 %*	*88.4*	*%*	
13C12-OCDD		*0.934*	*0.757-1.024*	*17-157 %*	*89.2*	*%*	
37Cl4-2,3,7,8-TCDD				*35-197 %*	*63.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-D-3

24I0364-56 (Solid)

Dioxins/Furans

Method: EPA 1613B — Sampled: 09/11/2024 16:20

Instrument: AUTOSPEC01 Analyst: pk — Analyzed: 11/02/2024 02:08

Analyte	DF/Split	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	Notes

20240911-SBT-TAT-D-3

24I0364-56 (Solid)

Extractions

Method: ASTM D2216 — Sampled: 09/11/2024 16:20

Instrument: N/A Analyst: TW — Analyzed: 09/19/2024 05:05

Sample Preparation: Preparation Method: No Prep-Organics — Extract ID: 24I0364-56

Preparation Batch: BMI0417 — Sample Size: 1 g (wet)

Prepared: 09/18/2024 — Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids			0.01	**73.78**	%	

Labeled compounds

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-3

24I0364-58 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 18:58

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-58 A 02

Preparation Batch: BMI0474 — Sample Size: 13.58 g (wet) — Dry Weight:10.03 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 73.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	19.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	19.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	19.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	19.9	19.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	19.9	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	19.9	22.2	ug/kg	
2,4-Dimethylphenol	105-67-9	1	49.9	99.7	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	19.9	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.7	199	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	19.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	19.9	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	19.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	19.9	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	19.9	ND	ug/kg	U
Dibenzofuran	132-64-9	1	19.9	19.9	ND	ug/kg	U
Fluorene	86-73-7	1	19.9	19.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	19.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	19.9	19.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.7	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	19.9	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	19.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	19.9	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	19.9	11.7	ug/kg	J
Pyrene	129-00-0	1	10.0	19.9	10.3	ug/kg	J
Butylbenzylphthalate	85-68-7	1	10.0	19.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	19.9	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	19.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	44.0	ug/kg	J
Di-n-Octylphthalate	117-84-0	1	10.0	19.9	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	19.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	19.9	19.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	19.9	19.9	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-3

24I0364-58 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/11/2024 16:20

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 18:58

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	19.9	19.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*79.5*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*71.0*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*81.0*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*84.1*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*92.9*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*91.9*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*108*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*101*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-3

24I0364-58 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/11/2024 16:20

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 18:46

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-58 A 02

Preparation Batch: BMI0474 — Sample Size: 13.58 g (wet) — Dry Weight:10.03 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 73.84

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	4.4	ug/kg	J
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.7	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	29.9	ug/kg	
2,4-Dimethylphenol	105-67-9	1	10.0	19.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	19.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	19.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*87.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*115*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-PCB-3

24I0364-58 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/11/2024 16:20

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 21:06

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-58 A 01
	Preparation Batch: BMI0473	Sample Size: 16.98 g (wet)	Dry Weight:12.54 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 73.84
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-58 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-58 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*86.4*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*83.4*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*94.4*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*84.9*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-3

24I0364-59 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/11/2024 16:20

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 21:03

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-59 A

Preparation Batch: BMI0526 — Sample Size: 0.0316 g (wet) — Dry Weight:0.02 g

Prepared: 09/20/2024 — Final Volume: 0.0316 mL — % Solids: 74.08

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	6.76	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-TOC-3

24I0364-59 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/11/2024 16:20

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-59

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 74.08

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	74.08	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-3

24I0364-60 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/11/2024 16:20

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:31

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-60 A 01

Preparation Batch: BMI0484 — Sample Size: 1.085 g (wet) — Dry Weight:0.80 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 73.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.05	0.25	2.77	mg/kg	
Cadmium	7440-43-9	20	0.04	0.13	0.12	mg/kg	J
Copper	7440-50-8	20	0.22	0.63	21.0	mg/kg	
Zinc	7440-66-6	20	3.7	7.5	60.0	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-3

24I0364-60 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/11/2024 16:20

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:12

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-60 A 01

Preparation Batch: BMI0484 — Sample Size: 1.085 g (wet) — Dry Weight:0.80 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 73.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.63	3.14	24.7	mg/kg	D
Lead	7439-92-1	20	0.07	0.13	3.91	mg/kg	
Silver	7440-22-4	20	0.03	0.25	0.07	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240911-SBT-TAT-M-3

24I0364-60 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/11/2024 16:20

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:23

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-60 A

Preparation Batch: BMI0650 — Sample Size: 0.223 g (wet) — Dry Weight:0.16 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 73.44

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00641	0.0305	0.0217	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-Dx/A-1

24I0364-61 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 08:35

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 18:57

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-61 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.44 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 94.37

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.30	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.6	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*80.7*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TPHG-1

24I0364-62 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 08:35

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 14:39

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-62 A

Preparation Batch: BMI0464 — Sample Size: 4.647 g (wet) — Dry Weight:4.02 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 86.52

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	7000	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*96.6*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*98.4*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-1

24I0364-63 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 08:35

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:36

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-63 A 01

Preparation Batch: BMI0484 — Sample Size: 1.095 g (wet) — Dry Weight:0.95 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 86.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.21	2.67	mg/kg	
Cadmium	7440-43-9	20	0.03	0.11	0.13	mg/kg	
Copper	7440-50-8	20	0.18	0.53	31.9	mg/kg	
Zinc	7440-66-6	20	3.1	6.3	50.7	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-1

24I0364-63 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 08:35

Instrument: ICPMS1 Analyst: DOE — Analyzed: 10/01/2024 13:53

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-63 A 01

Preparation Batch: BMI0484 — Sample Size: 1.095 g (wet) — Dry Weight:0.95 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 86.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	200	2.74	5.28	196	mg/kg	D
Lead	7439-92-1	20	0.05	0.11	2.41	mg/kg	
Silver	7440-22-4	20	0.02	0.21	0.06	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-1

24I0364-63 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 08:35

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:25

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-63 A

Preparation Batch: BMI0650 — Sample Size: 0.233 g (wet) — Dry Weight:0.20 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 86.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00521	0.0248	0.0549	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-Dx/A-2

24I0364-64 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 08:50

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 19:18

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-64 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.51 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 95.12

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.26	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.5	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*87.2*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TPHG-2

24I0364-65 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 08:50

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 15:01

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-65 A

Preparation Batch: BMI0464 — Sample Size: 4.166 g (wet) — Dry Weight:3.97 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 95.33

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	6540	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*98.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*99.6*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-2

24I0364-66 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 08:50

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:41

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-66 A 01

Preparation Batch: BMI0484 — Sample Size: 1.011 g (wet) — Dry Weight:0.96 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.33

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.21	3.43	mg/kg	
Cadmium	7440-43-9	20	0.03	0.10	0.09	mg/kg	J
Copper	7440-50-8	20	0.18	0.52	29.4	mg/kg	
Zinc	7440-66-6	20	3.0	6.2	36.6	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-2

24I0364-66 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 08:50

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:22

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-66 A 01

Preparation Batch: BMI0484 — Sample Size: 1.011 g (wet) — Dry Weight:0.96 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.33

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.35	2.59	126	mg/kg	D
Lead	7439-92-1	20	0.05	0.10	1.86	mg/kg	
Silver	7440-22-4	20	0.02	0.21	0.04	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-2

24I0364-66 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 08:50

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:28

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-66 A

Preparation Batch: BMI0650 — Sample Size: 0.263 g (wet) — Dry Weight:0.25 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 95.33

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00419	0.0199	0.0520	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-Dx/A-3

24I0364-67 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 09:10

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 19:38

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-67 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.55 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 95.50

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.24	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.5	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*92.7*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TPHG-3

24I0364-68 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 09:10

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 15:23

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-68 A

Preparation Batch: BMI0464 — Sample Size: 2.703 g (wet) — Dry Weight:2.57 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 95.17

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	9970	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*96.9*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*98.9*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-3

24I0364-69 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 09:10

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:45

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-69 A 01

Preparation Batch: BMI0484 — Sample Size: 1.042 g (wet) — Dry Weight:0.99 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.20	9.48	mg/kg	
Cadmium	7440-43-9	20	0.03	0.10	0.08	mg/kg	J
Copper	7440-50-8	20	0.18	0.50	30.9	mg/kg	
Zinc	7440-66-6	20	2.9	6.1	43.4	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-3

24I0364-69 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 09:10

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:27

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-69 A 01

Preparation Batch: BMI0484 — Sample Size: 1.042 g (wet) — Dry Weight:0.99 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.31	2.52	142	mg/kg	D
Lead	7439-92-1	20	0.05	0.10	2.00	mg/kg	
Silver	7440-22-4	20	0.02	0.20	0.04	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-M-3

24I0364-69 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 09:10

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:30

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-69 A

Preparation Batch: BMI0650 — Sample Size: 0.247 g (wet) — Dry Weight:0.24 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 95.17

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00447	0.0213	0.0458	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-Dx-1

24I0364-70 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 11:15

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 19:58

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-70 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.43 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 94.31

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.30	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.6	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*78.8*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TPHG-1

24I0364-71 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 11:15

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 15:46

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-71 A

Preparation Batch: BMI0464 — Sample Size: 6.03 g (wet) — Dry Weight:5.74 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 95.14

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	4610	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*99.6*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*98.4*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-1

24I0364-72 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 11:15

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:50

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-72 A 01

Preparation Batch: BMI0484 — Sample Size: 1.002 g (wet) — Dry Weight:0.95 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.14

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.21	3.78	mg/kg	
Cadmium	7440-43-9	20	0.03	0.10	0.10	mg/kg	
Copper	7440-50-8	20	0.18	0.52	21.5	mg/kg	
Zinc	7440-66-6	20	3.1	6.3	41.4	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-1

24I0364-72 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 11:15

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 19:55

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-72 A 01

Preparation Batch: BMI0484 — Sample Size: 1.002 g (wet) — Dry Weight:0.95 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.14

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.36	2.62	19.0	mg/kg	D
Lead	7439-92-1	20	0.05	0.10	2.94	mg/kg	
Silver	7440-22-4	20	0.02	0.21	0.08	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-1

24I0364-72 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 11:15

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:32

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-72 A

Preparation Batch: BMI0650 — Sample Size: 0.221 g (wet) — Dry Weight:0.21 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 95.14

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00499	0.0238	ND	mg/kg	U

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-Dx-2

24I0364-73 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 11:35

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 20:18

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-73 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.51 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 95.10

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.26	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.5	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*76.0*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TPHG-2

24I0364-74 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 11:35

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 16:08

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-74 A

Preparation Batch: BMI0464 — Sample Size: 5.731 g (wet) — Dry Weight:5.37 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 93.73

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	4990	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*96.5*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*96.3*	*%*	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-2

24I0364-75 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 11:35

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 21:55

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-75 A 01

Preparation Batch: BMI0484 — Sample Size: 1.063 g (wet) — Dry Weight:1.00 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 93.73

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.20	2.50	mg/kg	
Cadmium	7440-43-9	20	0.03	0.10	0.08	mg/kg	J
Copper	7440-50-8	20	0.17	0.50	21.5	mg/kg	
Zinc	7440-66-6	20	2.9	6.0	37.3	mg/kg	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-2

24I0364-75 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 11:35

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 20:00

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-75 A 01

Preparation Batch: BMI0484 — Sample Size: 1.063 g (wet) — Dry Weight:1.00 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 93.73

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.30	2.51	20.7	mg/kg	D
Lead	7439-92-1	20	0.05	0.10	2.67	mg/kg	
Silver	7440-22-4	20	0.02	0.20	0.05	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-2

24I0364-75 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 11:35

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:39

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-75 A

Preparation Batch: BMI0650 — Sample Size: 0.222 g (wet) — Dry Weight:0.21 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 93.73

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00505	0.0240	0.0106	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-Dx-3

24I0364-76 (Solid)

Petroleum Hydrocarbons

Method: NWTPH-Dx — Sampled: 09/12/2024 11:50

Instrument: FID4 Analyst: NRB — Analyzed: 09/20/2024 20:38

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-76 A 01

Preparation Batch: BMI0426 — Sample Size: 10 g (wet) — Dry Weight:9.44 g

Prepared: 09/19/2024 — Final Volume: 1 mL — % Solids: 94.42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Diesel Range Organics (C12-C24)	DRO	1	5.30	ND	mg/kg	U
Motor Oil Range Organics (C24-C38)	RRO	1	10.6	ND	mg/kg	U
Surrogate: o-Terphenyl			*50-150 %*	*96.2*	*%*	

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WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TPHG-3

24I0364-77 (Solid)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/12/2024 11:50

Instrument: NT3 Analyst: LH — Analyzed: 09/19/2024 16:30

Sample Preparation: Preparation Method: EPA 5035 (Methanol Extraction) — Extract ID: 24I0364-77 A

Preparation Batch: BMI0464 — Sample Size: 5.334 g (wet) — Dry Weight:5.09 g

Prepared: 09/19/2024 — Final Volume: 5 mL — % Solids: 95.37

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	50	5160	ND	ug/kg	U
Surrogate: Toluene-d8			*80-120 %*	*98.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*78-123 %*	*97.2*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-3

24I0364-78 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B UCT-KED — Sampled: 09/12/2024 11:50

Instrument: ICPMS1 Analyst: HAL — Analyzed: 09/23/2024 22:00

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-78 A 01

Preparation Batch: BMI0484 — Sample Size: 1.064 g (wet) — Dry Weight:1.01 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.37

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	0.04	0.20	2.39	mg/kg	
Cadmium	7440-43-9	20	0.03	0.10	0.09	mg/kg	J
Copper	7440-50-8	20	0.17	0.49	25.9	mg/kg	
Zinc	7440-66-6	20	2.9	5.9	37.7	mg/kg	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-3

24I0364-78 (Solid)

Metals and Metallic Compounds

Method: EPA 6020B — Sampled: 09/12/2024 11:50

Instrument: ICPMS1 Analyst: DOE — Analyzed: 09/27/2024 20:05

Sample Preparation: Preparation Method: SWN EPA 3050B — Extract ID: 24I0364-78 A 01

Preparation Batch: BMI0484 — Sample Size: 1.064 g (wet) — Dry Weight:1.01 g

Prepared: 09/20/2024 — Final Volume: 50 mL — % Solids: 95.37

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Chromium	7440-47-3	100	1.28	2.46	19.7	mg/kg	D
Lead	7439-92-1	20	0.05	0.10	2.19	mg/kg	
Silver	7440-22-4	20	0.02	0.20	0.05	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-M-3

24I0364-78 (Solid)

Metals and Metallic Compounds

Method: EPA 7471B — Sampled: 09/12/2024 11:50

Instrument: HYDRA Analyst: ML — Analyzed: 10/01/2024 14:42

Sample Preparation: Preparation Method: SMM EPA 7471B — Extract ID: 24I0364-78 A

Preparation Batch: BMI0650 — Sample Size: 0.227 g (wet) — Dry Weight:0.22 g

Prepared: 09/26/2024 — Final Volume: 50 mL — % Solids: 95.37

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00485	0.0231	0.00649	mg/kg	J

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-3

24I0364-79 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 11:50

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 21:33

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-79 A

Preparation Batch: BMI0526 — Sample Size: 0.2679 g (wet) — Dry Weight:0.25 g

Prepared: 09/20/2024 — Final Volume: 0.2679 mL — % Solids: 94.15

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.06	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-3

24I0364-79 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 11:50

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-79

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 94.15

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	94.15	%	

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-1

24I0364-80 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:15

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 19:38

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-80 A 02

Preparation Batch: BMI0474 — Sample Size: 10.58 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.59

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	50.0	99.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.9	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	99.9	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-1

24I0364-80 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:15

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 19:38

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*89.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*73.0*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*78.7*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*96.4*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*89.6*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*100*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*106*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*102*	*%*	Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-1

24I0364-80 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 11:15

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 19:24

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-80 A 02

Preparation Batch: BMI0474 — Sample Size: 10.58 g (wet) — Dry Weight:10.01 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.59

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	99.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	10.5	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*100*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*165*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-1

24I0364-80 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 11:15

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 21:26

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-80 A 01
	Preparation Batch: BMI0473	Sample Size: 13.26 g (wet)	Dry Weight:12.54 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 94.59
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-80 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-80 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*95.5*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*87.1*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*105*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*91.8*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-2

24I0364-81 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:35

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 20:18

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-81 A 02

Preparation Batch: BMI0474 — Sample Size: 10.58 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	50.0	100	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	100	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	100	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-2

24I0364-81 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:35

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 20:18

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*88.4*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*78.8*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*90.1*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*94.9*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*99.2*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*99.4*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*104*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*98.5*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-2

24I0364-81 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 11:35

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 20:02

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-81 A 02

Preparation Batch: BMI0474 — Sample Size: 10.58 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.52

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	100	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	11.2	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*99.8*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*157*	*%*	*, Q

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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-2

24I0364-81 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 11:35
Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 21:47

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-81 A 01
	Preparation Batch: BMI0473	Sample Size: 13.26 g (wet)	Dry Weight:12.53 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 94.52
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-81 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-81 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*92.3*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*85.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*103*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*89.9*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-3

24I0364-82 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 20:57

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-82 A 02

Preparation Batch: BMI0474 — Sample Size: 10.57 g (wet) — Dry Weight:10.03 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.93

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	19.9	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	19.9	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	19.9	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	19.9	19.9	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	19.9	ND	ug/kg	U
4-Methylphenol	106-44-5	1	14.9	19.9	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	49.8	99.7	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	19.9	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.7	199	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	19.9	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	19.9	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	19.9	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	19.9	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	19.9	ND	ug/kg	U
Dibenzofuran	132-64-9	1	19.9	19.9	ND	ug/kg	U
Fluorene	86-73-7	1	19.9	19.9	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.8	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	19.9	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	19.9	19.9	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.8	99.7	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	19.9	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	19.9	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	19.9	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	19.9	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	19.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	19.9	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	19.9	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	19.9	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.8	54.9	ug/kg	
Di-n-Octylphthalate	117-84-0	1	10.0	19.9	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	19.9	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	19.9	19.9	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	19.9	19.9	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-3

24I0364-82 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 11:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 20:57

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	19.9	19.9	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*85.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*78.6*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*87.9*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*88.7*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*95.6*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*101*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*98.7*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*95.5*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-3

24I0364-82 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 11:50

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 20:40

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-82 A 02

Preparation Batch: BMI0474 — Sample Size: 10.57 g (wet) — Dry Weight:10.03 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.93

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	19.9	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.8	99.7	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	10.0	19.9	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	19.9	10.2	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	19.9	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*97.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*139*	*%*	Q, *

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-PCB-3

24I0364-82 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 11:50
Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 22:08

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-82 A 01
	Preparation Batch: BMI0473	Sample Size: 13.17 g (wet)	Dry Weight:12.50 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 94.93
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-82 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-82 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*92.7*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*90.3*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*101*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*93.6*	*%*	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-1

24I0364-86 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 11:15

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 22:04

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-86 A

Preparation Batch: BMI0526 — Sample Size: 0.2354 g (wet) — Dry Weight:0.22 g

Prepared: 09/20/2024 — Final Volume: 0.2354 mL — % Solids: 94.15

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.05	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-1

24I0364-86 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 11:15

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-86

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 94.15

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	94.15	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-2

24I0364-87 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 11:35

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/26/2024 22:34

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-87 A

Preparation Batch: BMI0526 — Sample Size: 0.3291 g (wet) — Dry Weight:0.31 g

Prepared: 09/20/2024 — Final Volume: 0.3291 mL — % Solids: 94.04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.17	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-MSG-CB-TOC-2

24I0364-87 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 11:35

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-87

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 94.04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	94.04	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-1

24I0364-88 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 08:35

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/27/2024 00:05

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-88 A

Preparation Batch: BMI0526 — Sample Size: 0.2139 g (wet) — Dry Weight:0.20 g

Prepared: 09/20/2024 — Final Volume: 0.2139 mL — % Solids: 94.95

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.11	%	

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Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-1

24I0364-88 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 08:35

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-88

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 94.95

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	94.95	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-2

24I0364-89 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 08:50

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/27/2024 00:36

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-89 A

Preparation Batch: BMI0526 — Sample Size: 0.2202 g (wet) — Dry Weight:0.21 g

Prepared: 09/20/2024 — Final Volume: 0.2202 mL — % Solids: 96.09

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.07	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-2

24I0364-89 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 08:50

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-89

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 96.09

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	96.09	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-3

24I0364-90 (Solid)

Wet Chemistry

Method: EPA 9060A m — Sampled: 09/12/2024 09:10

Instrument: TOC Cube Analyst: ARR — Analyzed: 09/27/2024 01:06

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-90 A

Preparation Batch: BMI0526 — Sample Size: 0.2166 g (wet) — Dry Weight:0.21 g

Prepared: 09/20/2024 — Final Volume: 0.2166 mL — % Solids: 95.77

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Organic Carbon		1	0.02	0.02	0.06	%	

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-TOC-3

24I0364-90 (Solid)

Wet Chemistry

Method: SM 2540 G-11 — Sampled: 09/12/2024 09:10

Instrument: BAL2 Analyst: LM — Analyzed: 09/23/2024 09:43

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 24I0364-90

Preparation Batch: BMI0559 — Sample Size: 5 g (wet)

Prepared: 09/23/2024 — Final Volume: 5 mL — % Solids: 95.77

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	95.77	%	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-1

24I0364-91 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 08:35

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 21:36

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-91 A 02

Preparation Batch: BMI0474 — Sample Size: 10.62 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.32

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	49.9	99.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.8	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.9	49.9	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.9	99.8	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.9	49.9	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.9	39.9	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-1

24I0364-91 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 08:35

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 21:36

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*85.3*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*78.3*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*88.4*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*90.7*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*95.1*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*96.8*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*96.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*93.3*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-1

24I0364-91 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 08:35

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 21:18

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-91 A 02

Preparation Batch: BMI0474 — Sample Size: 10.62 g (wet) — Dry Weight:10.02 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 94.32

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.9	99.8	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	16.2	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*95.0*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*152*	*%*	*, Q

Analytical Resources, LLC
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Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-1

24I0364-91 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 08:35
Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 22:29

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-91 A 01
	Preparation Batch: BMI0473	Sample Size: 13.25 g (wet)	Dry Weight:12.50 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 94.32
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-91 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-91 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*96.2*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*90.4*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*104*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*93.3*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-2

24I0364-92 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 08:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 22:16

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-92 A 02

Preparation Batch: BMI0474 — Sample Size: 10.59 g (wet) — Dry Weight:10.08 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 95.23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	9.9	19.8	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	9.9	19.8	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	9.9	19.8	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	19.8	19.8	ND	ug/kg	U
2-Methylphenol	95-48-7	1	9.9	19.8	ND	ug/kg	U
4-Methylphenol	106-44-5	1	14.9	19.8	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	49.6	99.2	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	9.9	19.8	ND	ug/kg	U
Naphthalene	91-20-3	1	9.9	19.8	ND	ug/kg	U
Benzoic acid	65-85-0	1	99.2	198	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	9.9	19.8	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	9.9	19.8	ND	ug/kg	U
Acenaphthylene	208-96-8	1	9.9	19.8	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	9.9	19.8	ND	ug/kg	U
Acenaphthene	83-32-9	1	9.9	19.8	ND	ug/kg	U
Dibenzofuran	132-64-9	1	19.8	19.8	ND	ug/kg	U
Fluorene	86-73-7	1	19.8	19.8	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	34.7	49.6	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	9.9	19.8	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	19.8	19.8	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	49.6	99.2	ND	ug/kg	U
Phenanthrene	85-01-8	1	9.9	19.8	ND	ug/kg	U
Anthracene	120-12-7	1	9.9	19.8	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	9.9	19.8	ND	ug/kg	U
Fluoranthene	206-44-0	1	9.9	19.8	ND	ug/kg	U
Pyrene	129-00-0	1	9.9	19.8	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	9.9	19.8	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	9.9	19.8	ND	ug/kg	U
Chrysene	218-01-9	1	9.9	19.8	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	39.7	49.6	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	9.9	19.8	ND	ug/kg	U
Benzofluoranthenes, Total		1	29.7	39.7	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	9.9	19.8	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	19.8	19.8	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	19.8	19.8	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-2

24I0364-92 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 08:50

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 22:16

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	19.8	19.8	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*80.1*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*73.6*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*81.5*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*85.4*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*88.7*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*90.6*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*93.6*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*89.6*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-2

24I0364-92 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 08:50

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 21:56

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-92 A 02

Preparation Batch: BMI0474 — Sample Size: 10.59 g (wet) — Dry Weight:10.08 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 95.23

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	9.9	19.8	ND	ug/kg	U
Benzoic acid	65-85-0	1	49.6	99.2	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	9.9	19.8	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	9.9	19.8	10.7	ug/kg	J, B
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	9.9	19.8	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*92.9*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*140*	*%*	*, Q

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-2

24I0364-92 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 08:50

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 22:50

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-92 A 01
	Preparation Batch: BMI0473	Sample Size: 13.14 g (wet)	Dry Weight:12.51 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 95.23
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-92 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-92 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*95.7*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*87.3*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*106*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*85.5*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-3

24I0364-93 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 09:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 22:55

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-93 A 02

Preparation Batch: BMI0474 — Sample Size: 10.49 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 95.29

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	10.0	20.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	10.0	20.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	10.0	20.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	20.0	20.0	ND	ug/kg	U
2-Methylphenol	95-48-7	1	10.0	20.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	15.0	20.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	50.0	100	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	10.0	20.0	ND	ug/kg	U
Naphthalene	91-20-3	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	100	200	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	10.0	20.0	ND	ug/kg	U
2-Methylnaphthalene	91-57-6	1	10.0	20.0	ND	ug/kg	U
Acenaphthylene	208-96-8	1	10.0	20.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	10.0	20.0	ND	ug/kg	U
Acenaphthene	83-32-9	1	10.0	20.0	ND	ug/kg	U
Dibenzofuran	132-64-9	1	20.0	20.0	ND	ug/kg	U
Fluorene	86-73-7	1	20.0	20.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	35.0	50.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	10.0	20.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	20.0	20.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	50.0	100	ND	ug/kg	U
Phenanthrene	85-01-8	1	10.0	20.0	ND	ug/kg	U
Anthracene	120-12-7	1	10.0	20.0	ND	ug/kg	U
Di-n-Butylphthalate	84-74-2	1	10.0	20.0	ND	ug/kg	U
Fluoranthene	206-44-0	1	10.0	20.0	ND	ug/kg	U
Pyrene	129-00-0	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	10.0	20.0	ND	ug/kg	U
Benzo(a)anthracene	56-55-3	1	10.0	20.0	ND	ug/kg	U
Chrysene	218-01-9	1	10.0	20.0	ND	ug/kg	U
bis(2-Ethylhexyl)phthalate	117-81-7	1	40.0	50.0	ND	ug/kg	U
Di-n-Octylphthalate	117-84-0	1	10.0	20.0	ND	ug/kg	U
Benzofluoranthenes, Total		1	30.0	40.0	ND	ug/kg	U
Benzo(a)pyrene	50-32-8	1	10.0	20.0	ND	ug/kg	U
Indeno(1,2,3-cd)pyrene	193-39-5	1	20.0	20.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	20.0	20.0	ND	ug/kg	U

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-3

24I0364-93 (Solid)

Semivolatile Organic Compounds

Method: EPA 8270E — Sampled: 09/12/2024 09:10

Instrument: NT10 Analyst: RJL — Analyzed: 09/27/2024 22:55

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Benzo(g,h,i)perylene	191-24-2	1	20.0	20.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*81.7*	*%*	
Surrogate: Phenol-d5				*29-120 %*	*73.7*	*%*	
Surrogate: 2-Chlorophenol-d4				*31-120 %*	*81.5*	*%*	
Surrogate: 1,2-Dichlorobenzene-d4				*32-120 %*	*84.8*	*%*	
Surrogate: Nitrobenzene-d5				*30-120 %*	*89.1*	*%*	
Surrogate: 2-Fluorobiphenyl				*35-120 %*	*92.4*	*%*	
Surrogate: 2,4,6-Tribromophenol				*24-134 %*	*92.5*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*88.7*	*%*	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-3

24I0364-93 (Solid)

Semivolatile Organic Compounds - SIM

Method: EPA 8270E-SIM — Sampled: 09/12/2024 09:10

Instrument: NT14 Analyst: RJL — Analyzed: 10/12/2024 22:34

Sample Preparation: Preparation Method: EPA 3546 (Microwave) — Extract ID: 24I0364-93 A 02

Preparation Batch: BMI0474 — Sample Size: 10.49 g (wet) — Dry Weight:10.00 g

Prepared: 09/23/2024 — Final Volume: 1 mL — % Solids: 95.29

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Phenol	108-95-2	1	2.5	5.0	ND	ug/kg	U
1,4-Dichlorobenzene	106-46-7	1	2.5	5.0	ND	ug/kg	U
1,2-Dichlorobenzene	95-50-1	1	2.5	5.0	ND	ug/kg	U
Benzyl Alcohol	100-51-6	1	10.0	20.0	ND	ug/kg	U
Benzoic acid	65-85-0	1	50.0	100	ND	ug/kg	U
2-Methylphenol	95-48-7	1	2.5	5.0	ND	ug/kg	U
4-Methylphenol	106-44-5	1	2.5	5.0	ND	ug/kg	U
2,4-Dimethylphenol	105-67-9	1	10.0	20.0	ND	ug/kg	U
1,2,4-Trichlorobenzene	120-82-1	1	5.0	5.0	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	2.5	5.0	ND	ug/kg	U
Dimethylphthalate	131-11-3	1	2.5	5.0	ND	ug/kg	U
Diethyl phthalate	84-66-2	1	10.0	20.0	ND	ug/kg	U
N-Nitrosodiphenylamine	86-30-6	1	2.5	5.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	2.5	5.0	ND	ug/kg	U
Pentachlorophenol	87-86-5	1	10.0	20.0	ND	ug/kg	U
Butylbenzylphthalate	85-68-7	1	2.5	5.0	ND	ug/kg	U
Dibenzo(a,h)anthracene	53-70-3	1	2.5	5.0	ND	ug/kg	U
Surrogate: 2-Fluorophenol				*27-120 %*	*94.3*	*%*	
Surrogate: p-Terphenyl-d14				*37-120 %*	*156*	*%*	*, Q

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

20240912-G-CB-PCB-3

24I0364-93 (Solid)

Aroclor PCB

Method: EPA 8082A — Sampled: 09/12/2024 09:10

Instrument: ECD5 Analyst: AA — Analyzed: 09/27/2024 23:10

Sample Preparation:	Preparation Method: EPA 3546 (Microwave)		Extract ID: 24I0364-93 A 01
	Preparation Batch: BMI0473	Sample Size: 13.12 g (wet)	Dry Weight:12.50 g
	Prepared: 09/23/2024	Final Volume: 2.5 mL	% Solids: 95.29
Sample Cleanup:	Cleanup Method: Sulfuric Acid		Extract ID:24I0364-93 A 01
	Cleanup Batch: CMI0161	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:24I0364-93 A 01
	Cleanup Batch: CMI0162	Initial Volume: 2.5 uL	
	Cleaned: 26-Sep-2024	Final Volume: 2.5 uL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Aroclor 1016	12674-11-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1221	11104-28-2	1	2.0	4.0	ND	ug/kg	U
Aroclor 1232	11141-16-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1242	53469-21-9	1	2.0	4.0	ND	ug/kg	U
Aroclor 1248	12672-29-6	1	2.0	4.0	ND	ug/kg	U
Aroclor 1254	11097-69-1	1	2.0	4.0	ND	ug/kg	U
Aroclor 1260	11096-82-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1262	37324-23-5	1	2.0	4.0	ND	ug/kg	U
Aroclor 1268	11100-14-4	1	2.0	4.0	ND	ug/kg	U
Surrogate: Decachlorobiphenyl				*40-126 %*	*95.6*	*%*	
Surrogate: Tetrachlorometaxylene				*44-120 %*	*92.2*	*%*	
Surrogate: Decachlorobiphenyl [2C]				*40-126 %*	*106*	*%*	
Surrogate: Tetrachlorometaxylene [2C]				*44-120 %*	*95.7*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Trip Blanks

24I0364-94 (Water)

Volatile Organic Compounds

Method: NWTPHg — Sampled: 09/11/2024 11:25
Instrument: NT3 Analyst: LH — Analyzed: 09/20/2024 11:32

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 24I0364-94 A
Preparation Batch: BMI0501 — Sample Size: 10 mL
Prepared: 09/20/2024 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-Nap)	GRO	1	100	ND	ug/L	U
Surrogate: Toluene-d8			*80-120 %*	*98.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*99.7*	*%*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BMI0464 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0464-BLK1)				Prepared: 19-Sep-2024 Analyzed: 19-Sep-2024 09:04						
Gasoline Range Organics (Tol-Nap)	ND	5000	ug/kg							U
Surrogate: Toluene-d8	4.92		ug/kg	*5.00*		*98.4*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.02		ug/kg	*5.00*		*100*	*78-123*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BMI0464 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0464-BS1)				Prepared: 19-Sep-2024 Analyzed: 19-Sep-2024 07:13						
Gasoline Range Organics (Tol-Nap)	56900	5000	ug/kg	50000		114	70-121			
Surrogate: Toluene-d8	4.92		ug/kg	*5.00*		*98.4*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.00		ug/kg	*5.00*		*100*	*78-123*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BMI0464 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0464-BSD1)				Prepared: 19-Sep-2024 Analyzed: 19-Sep-2024 07:57						
Gasoline Range Organics (Tol-Nap)	48600	5000	ug/kg	50000		97.3	70-121	15.60	30	
Surrogate: Toluene-d8	4.98		ug/kg	*5.00*		*99.6*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.15		ug/kg	*5.00*		*103*	*78-123*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Volatile Organic Compounds - Quality Control

Batch BMI0501 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0501-BLK1)			Prepared: 20-Sep-2024 Analyzed: 20-Sep-2024 09:58							
Gasoline Range Organics (Tol-Nap)	ND	100	ug/L							U
Surrogate: Toluene-d8	4.84		ug/L	*5.00*		*96.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.88		ug/L	*5.00*		*97.6*	*80-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BMI0501 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0501-BS1)				Prepared: 20-Sep-2024 Analyzed: 20-Sep-2024 07:23						
Gasoline Range Organics (Tol-Nap)	1140	100	ug/L	1000		114	72-128			
Surrogate: Toluene-d8	4.94		ug/L	*5.00*		*98.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5.02		ug/L	*5.00*		*100*	*80-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BMI0501 - NWTPHg

Instrument: NT3 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0501-BSD1)				Prepared: 20-Sep-2024 Analyzed: 20-Sep-2024 08:07						
Gasoline Range Organics (Tol-Nap)	1090	100	ug/L	1000		109	72-128	4.39	30	
Surrogate: Toluene-d8	4.94		ug/L	*5.00*		*98.7*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.96		ug/L	*5.00*		*99.3*	*80-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0474-BLK1)				Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 12:33							
Phenol	ND	10.0	20.0	ug/kg							U
1,4-Dichlorobenzene	ND	10.0	20.0	ug/kg							U
1,2-Dichlorobenzene	ND	10.0	20.0	ug/kg							U
Benzyl Alcohol	ND	20.0	20.0	ug/kg							U
2-Methylphenol	ND	10.0	20.0	ug/kg							U
4-Methylphenol	ND	15.0	20.0	ug/kg							U
2,4-Dimethylphenol	ND	50.0	100	ug/kg							U
1,2,4-Trichlorobenzene	ND	10.0	20.0	ug/kg							U
Naphthalene	ND	10.0	20.0	ug/kg							U
Benzoic acid	ND	100	200	ug/kg							U
Hexachlorobutadiene	ND	10.0	20.0	ug/kg							U
2-Methylnaphthalene	ND	10.0	20.0	ug/kg							U
Acenaphthylene	ND	10.0	20.0	ug/kg							U
Dimethylphthalate	ND	10.0	20.0	ug/kg							U
Acenaphthene	ND	10.0	20.0	ug/kg							U
Dibenzofuran	ND	20.0	20.0	ug/kg							U
Fluorene	ND	20.0	20.0	ug/kg							U
Diethyl phthalate	ND	35.0	50.0	ug/kg							U
N-Nitrosodiphenylamine	ND	10.0	20.0	ug/kg							U
Hexachlorobenzene	ND	20.0	20.0	ug/kg							U
Pentachlorophenol	ND	50.0	100	ug/kg							U
Phenanthrene	ND	10.0	20.0	ug/kg							U
Anthracene	ND	10.0	20.0	ug/kg							U
Di-n-Butylphthalate	ND	10.0	20.0	ug/kg							U
Fluoranthene	ND	10.0	20.0	ug/kg							U
Pyrene	ND	10.0	20.0	ug/kg							U
Butylbenzylphthalate	ND	10.0	20.0	ug/kg							U
Benzo(a)anthracene	ND	10.0	20.0	ug/kg							U
Chrysene	ND	10.0	20.0	ug/kg							U
bis(2-Ethylhexyl)phthalate	ND	40.0	50.0	ug/kg							U
Di-n-Octylphthalate	ND	10.0	20.0	ug/kg							U
Benzofluoranthenes, Total	ND	30.0	40.0	ug/kg							U
Benzo(a)pyrene	ND	10.0	20.0	ug/kg							U
Indeno(1,2,3-cd)pyrene	ND	20.0	20.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	20.0	20.0	ug/kg							U

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0474-BLK1)	Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 12:33										
Benzo(g,h,i)perylene	ND	20.0	20.0	ug/kg							U
Surrogate: 2-Fluorophenol	674			ug/kg	*750*		*89.9*	*27-120*			
Surrogate: Phenol-d5	632			ug/kg	*750*		*84.3*	*29-120*			
Surrogate: 2-Chlorophenol-d4	681			ug/kg	*750*		*90.7*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	448			ug/kg	*500*		*89.6*	*32-120*			
Surrogate: Nitrobenzene-d5	460			ug/kg	*500*		*92.1*	*30-120*			
Surrogate: 2-Fluorobiphenyl	437			ug/kg	*500*		*87.5*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	613			ug/kg	*750*		*81.7*	*24-134*			
Surrogate: p-Terphenyl-d14	470			ug/kg	*500*		*94.0*	*37-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0474-BS1)				Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 13:14							
Phenol	400	10.0	20.0	ug/kg	500		80.0	31-120			
1,4-Dichlorobenzene	469	10.0	20.0	ug/kg	500		93.8	39-120			
1,2-Dichlorobenzene	428	10.0	20.0	ug/kg	500		85.5	40-120			
Benzyl Alcohol	530	20.0	20.0	ug/kg	500		106	19-120			
2-Methylphenol	419	10.0	20.0	ug/kg	500		83.8	11-120			
4-Methylphenol	444	15.0	20.0	ug/kg	500		88.7	29-120			
2,4-Dimethylphenol	574	50.0	100	ug/kg	1500		38.2	10-120			
1,2,4-Trichlorobenzene	419	10.0	20.0	ug/kg	500		83.8	35-120			
Naphthalene	434	10.0	20.0	ug/kg	500		86.9	41-120			
Benzoic acid	1300	100	200	ug/kg	2250		57.6	10-120			
Hexachlorobutadiene	432	10.0	20.0	ug/kg	500		86.5	37-120			
2-Methylnaphthalene	475	10.0	20.0	ug/kg	500		95.0	43-120			
Acenaphthylene	482	10.0	20.0	ug/kg	500		96.3	42-120			Q
Dimethylphthalate	519	10.0	20.0	ug/kg	500		104	43-120			
Acenaphthene	461	10.0	20.0	ug/kg	500		92.2	45-120			
Dibenzofuran	492	20.0	20.0	ug/kg	500		98.4	43-120			
Fluorene	457	20.0	20.0	ug/kg	500		91.4	40-120			
Diethyl phthalate	555	35.0	50.0	ug/kg	500		111	43-140			
N-Nitrosodiphenylamine	463	10.0	20.0	ug/kg	500		92.7	17-120			
Hexachlorobenzene	493	20.0	20.0	ug/kg	500		98.6	33-120			
Pentachlorophenol	1390	50.0	100	ug/kg	1500		92.9	33-133			
Phenanthrene	464	10.0	20.0	ug/kg	500		92.8	49-120			
Anthracene	464	10.0	20.0	ug/kg	500		92.8	37-120			
Di-n-Butylphthalate	604	10.0	20.0	ug/kg	500		121	48-126			
Fluoranthene	375	10.0	20.0	ug/kg	500		75.0	38-127			Q
Pyrene	393	10.0	20.0	ug/kg	500		78.7	39-122			
Butylbenzylphthalate	591	10.0	20.0	ug/kg	500		118	45-132			
Benzo(a)anthracene	493	10.0	20.0	ug/kg	500		98.6	44-120			
Chrysene	485	10.0	20.0	ug/kg	500		97.1	47-120			
bis(2-Ethylhexyl)phthalate	636	40.0	50.0	ug/kg	500		127	10-130			
Di-n-Octylphthalate	476	10.0	20.0	ug/kg	500		95.2	10-124			
Benzofluoranthenes, Total	1080	30.0	40.0	ug/kg	1000		108	30-160			
Benzo(a)pyrene	500	10.0	20.0	ug/kg	500		99.9	37-120			
Indeno(1,2,3-cd)pyrene	356	20.0	20.0	ug/kg	500		71.3	30-160			Q
Dibenzo(a,h)anthracene	360	20.0	20.0	ug/kg	500		72.1	30-160			Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0474-BS1)					Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 13:14						
Benzo(g,h,i)perylene	305	20.0	20.0	ug/kg	500		61.0	10-150			Q
Surrogate: 2-Fluorophenol	701			ug/kg	*750*		*93.5*	*27-120*			
Surrogate: Phenol-d5	705			ug/kg	*750*		*94.0*	*29-120*			
Surrogate: 2-Chlorophenol-d4	701			ug/kg	*750*		*93.5*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	448			ug/kg	*500*		*89.6*	*32-120*			
Surrogate: Nitrobenzene-d5	503			ug/kg	*500*		*101*	*30-120*			
Surrogate: 2-Fluorobiphenyl	490			ug/kg	*500*		*98.1*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	744			ug/kg	*750*		*99.2*	*24-134*			
Surrogate: p-Terphenyl-d14	487			ug/kg	*500*		*97.5*	*37-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0474-BSD1)					Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 13:53						
Phenol	426	10.0	20.0	ug/kg	500		85.1	31-120	6.21	30	
1,4-Dichlorobenzene	519	10.0	20.0	ug/kg	500		104	39-120	10.20	30	
1,2-Dichlorobenzene	465	10.0	20.0	ug/kg	500		93.0	40-120	8.43	30	
Benzyl Alcohol	574	20.0	20.0	ug/kg	500		115	19-120	8.01	30	
2-Methylphenol	475	10.0	20.0	ug/kg	500		95.0	11-120	12.50	30	
4-Methylphenol	486	15.0	20.0	ug/kg	500		97.2	29-120	9.12	30	
2,4-Dimethylphenol	994	50.0	100	ug/kg	1500		66.3	10-120	53.60	30	*
1,2,4-Trichlorobenzene	444	10.0	20.0	ug/kg	500		88.9	35-120	5.91	30	
Naphthalene	469	10.0	20.0	ug/kg	500		93.9	41-120	7.75	30	
Benzoic acid	1250	100	200	ug/kg	2250		55.3	10-120	4.08	30	
Hexachlorobutadiene	461	10.0	20.0	ug/kg	500		92.3	37-120	6.50	30	
2-Methylnaphthalene	512	10.0	20.0	ug/kg	500		102	43-120	7.50	30	
Acenaphthylene	598	10.0	20.0	ug/kg	500		120	42-120	21.50	30	Q
Dimethylphthalate	535	10.0	20.0	ug/kg	500		107	43-120	3.06	30	
Acenaphthene	485	10.0	20.0	ug/kg	500		97.0	45-120	5.14	30	
Dibenzofuran	516	20.0	20.0	ug/kg	500		103	43-120	4.85	30	
Fluorene	480	20.0	20.0	ug/kg	500		96.0	40-120	4.93	30	
Diethyl phthalate	575	35.0	50.0	ug/kg	500		115	43-140	3.48	30	
N-Nitrosodiphenylamine	500	10.0	20.0	ug/kg	500		100	17-120	7.59	30	
Hexachlorobenzene	525	20.0	20.0	ug/kg	500		105	33-120	6.30	30	
Pentachlorophenol	1490	50.0	100	ug/kg	1500		99.4	33-133	6.74	30	
Phenanthrene	482	10.0	20.0	ug/kg	500		96.4	49-120	3.81	30	
Anthracene	491	10.0	20.0	ug/kg	500		98.1	37-120	5.59	30	
Di-n-Butylphthalate	594	10.0	20.0	ug/kg	500		119	48-126	1.63	30	
Fluoranthene	377	10.0	20.0	ug/kg	500		75.3	38-127	0.48	30	Q
Pyrene	394	10.0	20.0	ug/kg	500		78.8	39-122	0.11	30	
Butylbenzylphthalate	591	10.0	20.0	ug/kg	500		118	45-132	0.13	30	
Benzo(a)anthracene	517	10.0	20.0	ug/kg	500		103	44-120	4.73	30	
Chrysene	506	10.0	20.0	ug/kg	500		101	47-120	4.12	30	
bis(2-Ethylhexyl)phthalate	613	40.0	50.0	ug/kg	500		123	10-130	3.67	30	
Di-n-Octylphthalate	497	10.0	20.0	ug/kg	500		99.4	10-124	4.34	30	
Benzofluoranthenes, Total	1160	30.0	40.0	ug/kg	1000		116	30-160	7.23	30	
Benzo(a)pyrene	535	10.0	20.0	ug/kg	500		107	37-120	6.85	30	
Indeno(1,2,3-cd)pyrene	372	20.0	20.0	ug/kg	500		74.4	30-160	4.23	30	Q
Dibenzo(a,h)anthracene	376	20.0	20.0	ug/kg	500		75.1	30-160	4.12	30	Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0474-BSD1)					Prepared: 23-Sep-2024 Analyzed: 25-Sep-2024 13:53						
Benzo(g,h,i)perylene	310	20.0	20.0	ug/kg	500		62.0	10-150	1.69	30	Q
Surrogate: 2-Fluorophenol	730			ug/kg	*750*		*97.4*	*27-120*			
Surrogate: Phenol-d5	715			ug/kg	*750*		*95.3*	*29-120*			
Surrogate: 2-Chlorophenol-d4	725			ug/kg	*750*		*96.7*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	459			ug/kg	*500*		*91.9*	*32-120*			
Surrogate: Nitrobenzene-d5	500			ug/kg	*500*		*100*	*30-120*			
Surrogate: 2-Fluorobiphenyl	484			ug/kg	*500*		*96.9*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	795			ug/kg	*750*		*106*	*24-134*			
Surrogate: p-Terphenyl-d14	465			ug/kg	*500*		*93.0*	*37-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0474-MS1)	**Source: 24I0364-93**			Prepared: 23-Sep-2024 Analyzed: 27-Sep-2024 23:35							
Phenol	323	10.0	20.0	ug/kg	500	ND	64.5	31-120			
1,4-Dichlorobenzene	441	10.0	20.0	ug/kg	500	ND	88.2	39-120			
1,2-Dichlorobenzene	365	10.0	20.0	ug/kg	500	ND	73.1	40-120			
Benzyl Alcohol	391	20.0	20.0	ug/kg	500	ND	78.1	19-120			
2-Methylphenol	346	10.0	20.0	ug/kg	500	ND	69.1	11-120			
4-Methylphenol	346	15.0	20.0	ug/kg	500	ND	69.2	29-120			
2,4-Dimethylphenol	857	50.0	100	ug/kg	1500	ND	57.1	10-120			
1,2,4-Trichlorobenzene	373	10.0	20.0	ug/kg	500	ND	74.6	35-120			
Naphthalene	382	10.0	20.0	ug/kg	500	ND	76.4	41-120			
Benzoic acid	782	100	200	ug/kg	2250	ND	34.7	10-120			Q
Hexachlorobutadiene	398	10.0	20.0	ug/kg	500	ND	79.5	37-120			
2-Methylnaphthalene	405	10.0	20.0	ug/kg	500	ND	81.0	43-120			
Acenaphthylene	237	10.0	20.0	ug/kg	500	ND	47.4	42-120			Q
Dimethylphthalate	483	10.0	20.0	ug/kg	500	ND	96.5	43-120			
Acenaphthene	419	10.0	20.0	ug/kg	500	ND	83.9	45-120			
Dibenzofuran	446	20.0	20.0	ug/kg	500	ND	89.1	43-120			
Fluorene	424	20.0	20.0	ug/kg	500	ND	84.7	40-120			
Diethyl phthalate	514	35.0	50.0	ug/kg	500	ND	103	43-140			
N-Nitrosodiphenylamine	428	10.0	20.0	ug/kg	500	ND	85.5	17-120			
Hexachlorobenzene	446	20.0	20.0	ug/kg	500	ND	89.2	33-120			
Pentachlorophenol	1380	50.0	100	ug/kg	1500	ND	92.2	33-133			
Phenanthrene	430	10.0	20.0	ug/kg	500	ND	85.9	49-120			
Anthracene	423	10.0	20.0	ug/kg	500	ND	84.6	37-120			
Di-n-Butylphthalate	573	10.0	20.0	ug/kg	500	ND	115	48-126			
Fluoranthene	334	10.0	20.0	ug/kg	500	ND	66.7	38-127			Q
Pyrene	385	10.0	20.0	ug/kg	500	ND	77.0	39-122			Q
Butylbenzylphthalate	515	10.0	20.0	ug/kg	500	ND	103	45-132			
Benzo(a)anthracene	440	10.0	20.0	ug/kg	500	ND	88.0	44-120			
Chrysene	435	10.0	20.0	ug/kg	500	ND	87.0	47-120			
bis(2-Ethylhexyl)phthalate	508	40.0	50.0	ug/kg	500	ND	102	10-130			
Di-n-Octylphthalate	427	10.0	20.0	ug/kg	500	ND	85.4	10-124			
Benzofluoranthenes, Total	983	30.0	40.0	ug/kg	1000	ND	98.3	30-160			
Benzo(a)pyrene	461	10.0	20.0	ug/kg	500	ND	92.1	37-120			
Indeno(1,2,3-cd)pyrene	365	20.0	20.0	ug/kg	500	ND	72.9	30-160			
Dibenzo(a,h)anthracene	374	20.0	20.0	ug/kg	500	ND	74.7	30-160			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0474-MS1)	**Source: 24I0364-93**			Prepared: 23-Sep-2024 Analyzed: 27-Sep-2024 23:35							
Benzo(g,h,i)perylene	304	20.0	20.0	ug/kg	500	ND	60.7	10-150			
Surrogate: 2-Fluorophenol	546			ug/kg	*750*	*613*	*72.7*	*27-120*			
Surrogate: Phenol-d5	518			ug/kg	*750*	*553*	*69.0*	*29-120*			
Surrogate: 2-Chlorophenol-d4	541			ug/kg	*750*	*611*	*72.1*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	370			ug/kg	*500*	*424*	*74.0*	*32-120*			
Surrogate: Nitrobenzene-d5	412			ug/kg	*500*	*446*	*82.4*	*30-120*			
Surrogate: 2-Fluorobiphenyl	431			ug/kg	*500*	*462*	*86.1*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	675			ug/kg	*750*	*694*	*89.9*	*24-134*			
Surrogate: p-Terphenyl-d14	409			ug/kg	*500*	*444*	*81.9*	*37-120*			*Q*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BMI0474-MSD1)	**Source: 24I0364-93**			Prepared: 23-Sep-2024	Analyzed: 28-Sep-2024 00:14						
Phenol	401	10.0	20.0	ug/kg	500	ND	80.2	31-120	21.60	30	
1,4-Dichlorobenzene	525	10.0	20.0	ug/kg	500	ND	105	39-120	17.30	30	
1,2-Dichlorobenzene	481	10.0	20.0	ug/kg	500	ND	96.1	40-120	27.30	30	
Benzyl Alcohol	467	20.0	20.0	ug/kg	500	ND	93.4	19-120	17.80	30	
2-Methylphenol	477	10.0	20.0	ug/kg	500	ND	95.3	11-120	31.90	30	
4-Methylphenol	424	15.0	20.0	ug/kg	500	ND	84.8	29-120	20.20	30	
2,4-Dimethylphenol	1080	50.0	100	ug/kg	1500	ND	71.8	10-120	22.70	30	
1,2,4-Trichlorobenzene	470	10.0	20.0	ug/kg	500	ND	94.0	35-120	23.00	30	
Naphthalene	488	10.0	20.0	ug/kg	500	ND	97.6	41-120	24.40	30	
Benzoic acid	1220	100	200	ug/kg	2250	ND	54.2	10-120	43.80	30	Q
Hexachlorobutadiene	504	10.0	20.0	ug/kg	500	ND	101	37-120	23.60	30	
2-Methylnaphthalene	497	10.0	20.0	ug/kg	500	ND	99.4	43-120	20.50	30	
Acenaphthylene	272	10.0	20.0	ug/kg	500	ND	54.3	42-120	13.60	30	Q
Dimethylphthalate	535	10.0	20.0	ug/kg	500	ND	107	43-120	10.20	30	
Acenaphthene	503	10.0	20.0	ug/kg	500	ND	101	45-120	18.20	30	
Dibenzofuran	536	20.0	20.0	ug/kg	500	ND	107	43-120	18.40	30	
Fluorene	507	20.0	20.0	ug/kg	500	ND	101	40-120	17.90	30	
Diethyl phthalate	586	35.0	50.0	ug/kg	500	ND	117	43-140	13.10	30	
N-Nitrosodiphenylamine	480	10.0	20.0	ug/kg	500	ND	95.9	17-120	11.50	30	
Hexachlorobenzene	506	20.0	20.0	ug/kg	500	ND	101	33-120	12.60	30	
Pentachlorophenol	1680	50.0	100	ug/kg	1500	ND	112	33-133	19.60	30	
Phenanthrene	503	10.0	20.0	ug/kg	500	ND	101	49-120	15.70	30	
Anthracene	499	10.0	20.0	ug/kg	500	ND	99.8	37-120	16.50	30	
Di-n-Butylphthalate	686	10.0	20.0	ug/kg	500	ND	137	48-126	17.90	30	*
Fluoranthene	418	10.0	20.0	ug/kg	500	ND	83.6	38-127	22.50	30	Q
Pyrene	439	10.0	20.0	ug/kg	500	ND	87.7	39-122	12.90	30	Q
Butylbenzylphthalate	644	10.0	20.0	ug/kg	500	ND	129	45-132	22.20	30	
Benzo(a)anthracene	532	10.0	20.0	ug/kg	500	ND	106	44-120	19.00	30	
Chrysene	530	10.0	20.0	ug/kg	500	ND	106	47-120	19.60	30	
bis(2-Ethylhexyl)phthalate	608	40.0	50.0	ug/kg	500	ND	122	10-130	17.90	30	
Di-n-Octylphthalate	504	10.0	20.0	ug/kg	500	ND	101	10-124	16.60	30	
Benzofluoranthenes, Total	1190	30.0	40.0	ug/kg	1000	ND	119	30-160	19.00	30	
Benzo(a)pyrene	562	10.0	20.0	ug/kg	500	ND	112	37-120	19.80	30	
Indeno(1,2,3-cd)pyrene	438	20.0	20.0	ug/kg	500	ND	87.6	30-160	18.30	30	
Dibenzo(a,h)anthracene	446	20.0	20.0	ug/kg	500	ND	89.2	30-160	17.70	30	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Instrument: NT10 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BMI0474-MSD1)	**Source: 24I0364-93**			Prepared: 23-Sep-2024 Analyzed: 28-Sep-2024 00:14							
Benzo(g,h,i)perylene	370	20.0	20.0	ug/kg	500	ND	73.9	10-150	19.60	30	
Surrogate: 2-Fluorophenol	713			ug/kg	*750*	*613*	*95.0*	*27-120*			
Surrogate: Phenol-d5	664			ug/kg	*750*	*553*	*88.5*	*29-120*			
Surrogate: 2-Chlorophenol-d4	693			ug/kg	*750*	*611*	*92.3*	*31-120*			
Surrogate: 1,2-Dichlorobenzene-d4	492			ug/kg	*500*	*424*	*98.4*	*32-120*			
Surrogate: Nitrobenzene-d5	589			ug/kg	*500*	*446*	*118*	*30-120*			
Surrogate: 2-Fluorobiphenyl	537			ug/kg	*500*	*462*	*107*	*35-120*			
Surrogate: 2,4,6-Tribromophenol	836			ug/kg	*750*	*694*	*111*	*24-134*			
Surrogate: p-Terphenyl-d14	520			ug/kg	*500*	*444*	*104*	*37-120*			*Q*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - Quality Control

Batch BMI0474 - EPA 8270E

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL/FL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0474-BLK2)				Prepared: 23-Sep-2024 Analyzed: 11-Oct-2024 18:17							
Phenol	ND	2.5	5.0	ug/kg							U
1,4-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
1,2-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
Benzyl Alcohol	ND	10.0	20.0	ug/kg							U
Benzoic acid	61.5	50.0	100	ug/kg							J
2-Methylphenol	ND	2.5	5.0	ug/kg							U
4-Methylphenol	ND	2.5	5.0	ug/kg							U
2,4-Dimethylphenol	ND	10.0	20.0	ug/kg							U
1,2,4-Trichlorobenzene	ND	5.0	5.0	ug/kg							U
Hexachlorobutadiene	ND	2.5	5.0	ug/kg							U
Dimethylphthalate	ND	2.5	5.0	ug/kg							U
Diethyl phthalate	25.1	10.0	20.0	ug/kg							
N-Nitrosodiphenylamine	ND	2.5	5.0	ug/kg							U
Hexachlorobenzene	ND	2.5	5.0	ug/kg							U
Pentachlorophenol	ND	10.0	20.0	ug/kg							U
Butylbenzylphthalate	ND	2.5	5.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	2.5	5.0	ug/kg							U
Surrogate: 2-Fluorophenol	838			ug/kg	*750*		*112*	*27-120*			
Surrogate: p-Terphenyl-d14	909			ug/kg	*500*		*182*	*37-120*			**, Q*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0474-BLK3)	Prepared: 23-Sep-2024 Analyzed: 12-Oct-2024 18:08										
Phenol	ND	2.5	5.0	ug/kg							U
1,4-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
1,2-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
Benzyl Alcohol	ND	10.0	20.0	ug/kg							U
Benzoic acid	80.3	50.0	100	ug/kg							J
2-Methylphenol	ND	2.5	5.0	ug/kg							U
4-Methylphenol	ND	2.5	5.0	ug/kg							U
2,4-Dimethylphenol	ND	10.0	20.0	ug/kg							U
1,2,4-Trichlorobenzene	ND	5.0	5.0	ug/kg							U
Hexachlorobutadiene	ND	2.5	5.0	ug/kg							U
Dimethylphthalate	ND	2.5	5.0	ug/kg							U
Diethyl phthalate	28.6	10.0	20.0	ug/kg							
N-Nitrosodiphenylamine	ND	2.5	5.0	ug/kg							U
Hexachlorobenzene	ND	2.5	5.0	ug/kg							U
Pentachlorophenol	10.3	10.0	20.0	ug/kg							J
Butylbenzylphthalate	ND	2.5	5.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	2.5	5.0	ug/kg							U
Surrogate: 2-Fluorophenol	847			ug/kg	*750*		*113*	*27-120*			
Surrogate: p-Terphenyl-d14	859			ug/kg	*500*		*172*	*37-120*			*, Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0474-BLK4)				Prepared: 23-Sep-2024 Analyzed: 13-Oct-2024 02:59							
Phenol	ND	2.5	5.0	ug/kg							U
1,4-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
1,2-Dichlorobenzene	ND	2.5	5.0	ug/kg							U
Benzyl Alcohol	ND	10.0	20.0	ug/kg							U
Benzoic acid	57.6	50.0	100	ug/kg							J
2-Methylphenol	ND	2.5	5.0	ug/kg							U
4-Methylphenol	ND	2.5	5.0	ug/kg							U
2,4-Dimethylphenol	ND	10.0	20.0	ug/kg							U
1,2,4-Trichlorobenzene	ND	5.0	5.0	ug/kg							U
Hexachlorobutadiene	ND	2.5	5.0	ug/kg							U
Dimethylphthalate	ND	2.5	5.0	ug/kg							U
Diethyl phthalate	28.2	10.0	20.0	ug/kg							
N-Nitrosodiphenylamine	ND	2.5	5.0	ug/kg							U
Hexachlorobenzene	ND	2.5	5.0	ug/kg							U
Pentachlorophenol	11.5	10.0	20.0	ug/kg							J
Butylbenzylphthalate	ND	2.5	5.0	ug/kg							U
Dibenzo(a,h)anthracene	ND	2.5	5.0	ug/kg							U
Surrogate: 2-Fluorophenol	855			ug/kg	*750*		*114*	*27-120*			
Surrogate: p-Terphenyl-d14	865			ug/kg	*500*		*173*	*37-120*			*, Q

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL/FL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0474-BS2)				Prepared: 23-Sep-2024 Analyzed: 11-Oct-2024 18:55							
Phenol	396	2.5	5.0	ug/kg	500		79.2	30-160			
1,4-Dichlorobenzene	445	2.5	5.0	ug/kg	500		89.0	36-120			
1,2-Dichlorobenzene	412	2.5	5.0	ug/kg	500		82.4	36-120			
Benzyl Alcohol	480	10.0	20.0	ug/kg	500		96.1	25-123			
Benzoic acid	1240	50.0	100	ug/kg	2250		54.9	10-160			
2-Methylphenol	431	2.5	5.0	ug/kg	500		86.3	26-120			
4-Methylphenol	474	2.5	5.0	ug/kg	500		94.9	30-160			
2,4-Dimethylphenol	623	10.0	20.0	ug/kg	1500		41.5	10-120			
1,2,4-Trichlorobenzene	413	5.0	5.0	ug/kg	500		82.6	35-120			
Hexachlorobutadiene	429	2.5	5.0	ug/kg	500		85.8	34-120			
Dimethylphthalate	527	2.5	5.0	ug/kg	500		105	38-120			
Diethyl phthalate	568	10.0	20.0	ug/kg	500		114	55-120			B
N-Nitrosodiphenylamine	510	2.5	5.0	ug/kg	500		102	27-120			
Hexachlorobenzene	489	2.5	5.0	ug/kg	500		97.8	32-120			
Pentachlorophenol	1280	10.0	20.0	ug/kg	1500		85.2	26-120			Q, E
Butylbenzylphthalate	513	2.5	5.0	ug/kg	500		103	32-142			
Dibenzo(a,h)anthracene	510	2.5	5.0	ug/kg	500		102	28-125			
Surrogate: 2-Fluorophenol	745			ug/kg	*750*		*99.3*	*27-120*			
Surrogate: p-Terphenyl-d14	703			ug/kg	*500*		*141*	*37-120*			**, Q*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL/FL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0474-BSD2)					Prepared: 23-Sep-2024 Analyzed: 11-Oct-2024 19:34						
Phenol	384	2.5	5.0	ug/kg	500		76.8	30-160	3.07	30	
1,4-Dichlorobenzene	451	2.5	5.0	ug/kg	500		90.2	36-120	1.35	30	
1,2-Dichlorobenzene	416	2.5	5.0	ug/kg	500		83.3	36-120	1.07	30	
Benzyl Alcohol	472	10.0	20.0	ug/kg	500		94.3	25-123	1.83	30	
Benzoic acid	1050	50.0	100	ug/kg	2250		46.9	10-160	15.80	30	
2-Methylphenol	451	2.5	5.0	ug/kg	500		90.2	26-120	4.44	30	
4-Methylphenol	478	2.5	5.0	ug/kg	500		95.7	30-160	0.85	30	
2,4-Dimethylphenol	912	10.0	20.0	ug/kg	1500		60.8	10-120	37.80	30	*
1,2,4-Trichlorobenzene	417	5.0	5.0	ug/kg	500		83.4	35-120	1.00	30	
Hexachlorobutadiene	431	2.5	5.0	ug/kg	500		86.2	34-120	0.44	30	
Dimethylphthalate	535	2.5	5.0	ug/kg	500		107	38-120	1.55	30	
Diethyl phthalate	578	10.0	20.0	ug/kg	500		116	55-120	1.59	30	B
N-Nitrosodiphenylamine	514	2.5	5.0	ug/kg	500		103	27-120	0.95	30	
Hexachlorobenzene	487	2.5	5.0	ug/kg	500		97.4	32-120	0.42	30	
Pentachlorophenol	1280	10.0	20.0	ug/kg	1500		85.4	26-120	0.23	30	Q, E
Butylbenzylphthalate	519	2.5	5.0	ug/kg	500		104	32-142	1.28	30	
Dibenzo(a,h)anthracene	550	2.5	5.0	ug/kg	500		110	28-125	7.58	30	
Surrogate: 2-Fluorophenol	694			ug/kg	*750*		*92.6*	*27-120*			
Surrogate: p-Terphenyl-d14	719			ug/kg	*500*		*144*	*37-120*			*, Q*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0474-MS2)	**Source: 24I0364-93**			Prepared: 23-Sep-2024 Analyzed: 12-Oct-2024 23:12							
Phenol	369	2.6	5.2	ug/kg	525	ND	70.3	30-160			
1,4-Dichlorobenzene	381	2.6	5.2	ug/kg	525	ND	72.7	36-120			
1,2-Dichlorobenzene	350	2.6	5.2	ug/kg	525	ND	66.7	36-120			
Benzyl Alcohol	475	10.5	21.0	ug/kg	525	ND	90.5	25-123			
Benzoic acid	351	52.5	105	ug/kg	2360	ND	14.9	10-160			
2-Methylphenol	440	2.6	5.2	ug/kg	525	ND	83.8	26-120			
4-Methylphenol	467	2.6	5.2	ug/kg	525	ND	89.0	30-160			
2,4-Dimethylphenol	901	10.5	21.0	ug/kg	1570	ND	57.3	10-120			
1,2,4-Trichlorobenzene	356	5.2	5.2	ug/kg	525	ND	67.8	35-120			
Hexachlorobutadiene	336	2.6	5.2	ug/kg	525	ND	64.1	34-120			
Dimethylphthalate	497	2.6	5.2	ug/kg	525	ND	94.7	38-120			
Diethyl phthalate	564	10.5	21.0	ug/kg	525	ND	107	55-120			Q, B
N-Nitrosodiphenylamine	454	2.6	5.2	ug/kg	525	ND	86.5	27-120			
Hexachlorobenzene	271	2.6	5.2	ug/kg	525	ND	51.6	32-120			Q
Pentachlorophenol	1120	10.5	21.0	ug/kg	1570	ND	71.0	26-120			E
Butylbenzylphthalate	507	2.6	5.2	ug/kg	525	ND	96.7	32-142			
Dibenzo(a,h)anthracene	330	2.6	5.2	ug/kg	525	ND	63.0	28-125			
Surrogate: 2-Fluorophenol	646			ug/kg	*787*	*707*	*82.1*	*27-120*			
Surrogate: p-Terphenyl-d14	664			ug/kg	*525*	*782*	*126*	*37-120*			**, Q*

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Semivolatile Organic Compounds - SIM - Quality Control

Batch BMI0474 - EPA 8270E-SIM

Instrument: NT14 Analyst: RJL

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BMI0474-MSD2)	**Source: 24I0364-93**			Prepared: 23-Sep-2024 Analyzed: 12-Oct-2024 23:50							
Phenol	451	2.6	5.2	ug/kg	525	ND	85.9	30-160	19.90	30	
1,4-Dichlorobenzene	502	2.6	5.2	ug/kg	525	ND	95.6	36-120	27.30	30	
1,2-Dichlorobenzene	461	2.6	5.2	ug/kg	525	ND	87.8	36-120	27.20	30	
Benzyl Alcohol	583	10.5	21.0	ug/kg	525	ND	111	25-123	20.50	30	
Benzoic acid	1430	52.5	105	ug/kg	2360	ND	60.5	10-160	121.00	30	*
2-Methylphenol	549	2.6	5.2	ug/kg	525	ND	105	26-120	22.10	30	
4-Methylphenol	576	2.6	5.2	ug/kg	525	ND	110	30-160	20.80	30	
2,4-Dimethylphenol	1140	10.5	21.0	ug/kg	1570	ND	72.4	10-120	23.30	30	E
1,2,4-Trichlorobenzene	445	5.2	5.2	ug/kg	525	ND	84.8	35-120	22.20	30	
Hexachlorobutadiene	409	2.6	5.2	ug/kg	525	ND	77.9	34-120	19.40	30	
Dimethylphthalate	595	2.6	5.2	ug/kg	525	ND	113	38-120	18.00	30	
Diethyl phthalate	675	10.5	21.0	ug/kg	525	ND	129	55-120	18.00	30	*, Q, B
N-Nitrosodiphenylamine	566	2.6	5.2	ug/kg	525	ND	108	27-120	22.00	30	
Hexachlorobenzene	299	2.6	5.2	ug/kg	525	ND	57.0	32-120	9.86	30	Q
Pentachlorophenol	1360	10.5	21.0	ug/kg	1570	ND	86.4	26-120	19.50	30	E
Butylbenzylphthalate	605	2.6	5.2	ug/kg	525	ND	115	32-142	17.60	30	
Dibenzo(a,h)anthracene	397	2.6	5.2	ug/kg	525	ND	75.6	28-125	18.30	30	
Surrogate: 2-Fluorophenol	819			ug/kg	*787*	*707*	*104*	*27-120*			
Surrogate: p-Terphenyl-d14	815			ug/kg	*525*	*782*	*155*	*37-120*			*, Q

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BMI0426 - NWTPH-Dx

Instrument: FID4 Analyst: NRB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0426-BLK1)				Prepared: 19-Sep-2024 Analyzed: 20-Sep-2024 17:17						
Diesel Range Organics (C12-C24)	ND	5.00	mg/kg							U
Motor Oil Range Organics (C24-C38)	ND	10.0	mg/kg							U
Surrogate: o-Terphenyl	8.63		mg/kg	*11.3*		*76.7*	*50-150*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BMI0426 - NWTPH-Dx

Instrument: FID4 Analyst: NRB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0426-BS1)				Prepared: 19-Sep-2024 Analyzed: 20-Sep-2024 17:37						
Diesel Range Organics (C12-C24)	109	5.00	mg/kg	150		72.6	63-120			
Surrogate: o-Terphenyl	7.80		mg/kg	*11.3*		*69.3*	*50-150*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BMI0426 - NWTPH-Dx

Instrument: FID4 Analyst: NRB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0426-BSD1)				Prepared: 19-Sep-2024 Analyzed: 20-Sep-2024 17:57						
Diesel Range Organics (C12-C24)	111	5.00	mg/kg	150		74.1	63-120	2.02	30	
Surrogate: o-Terphenyl	8.07		mg/kg	*11.3*		*71.7*	*50-150*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BMI0426 - NWTPH-Dx

Instrument: FID4 Analyst: NRB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0426-MS1)	**Source: 24I0364-76**		Prepared: 19-Sep-2024 Analyzed: 20-Sep-2024 18:17							
Diesel Range Organics (C12-C24)	124	5.30	mg/kg	159	ND	77.8	63-120			
Surrogate: o-Terphenyl	8.50		mg/kg	*11.9*	*11.5*	*71.4*	*50-150*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Petroleum Hydrocarbons - Quality Control

Batch BMI0426 - NWTPH-Dx

Instrument: FID4 Analyst: NRB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BMI0426-MSD1)	**Source: 24I0364-76**		Prepared: 19-Sep-2024 Analyzed: 20-Sep-2024 18:37							
Diesel Range Organics (C12-C24)	99.3	5.30	mg/kg	159	ND	62.5	63-120	21.80	30	*
Surrogate: o-Terphenyl	7.25		mg/kg	*11.9*	*11.5*	*60.9*	*50-150*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BMI0473 - EPA 8082A

Instrument: ECD5 Analyst: AA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0473-BLK1)				Prepared: 23-Sep-2024 Analyzed: 30-Sep-2024 10:09							
Aroclor 1016	ND	2.0	4.0	ug/kg							U
Aroclor 1221	ND	2.0	4.0	ug/kg							U
Aroclor 1232	ND	2.0	4.0	ug/kg							U
Aroclor 1242	ND	2.0	4.0	ug/kg							U
Aroclor 1248	ND	2.0	4.0	ug/kg							U
Aroclor 1254	ND	2.0	4.0	ug/kg							U
Aroclor 1260	ND	2.0	4.0	ug/kg							U
Aroclor 1262	ND	2.0	4.0	ug/kg							U
Aroclor 1268	ND	2.0	4.0	ug/kg							U
Surrogate: Decachlorobiphenyl	8.92			ug/kg	*8.00*		*111*	*40-126*			
Surrogate: Tetrachlorometaxylene	8.71			ug/kg	*8.00*		*109*	*44-120*			
Surrogate: Decachlorobiphenyl [2C]	10.0			ug/kg	*8.00*		*125*	*40-126*			
Surrogate: Tetrachlorometaxylene [2C]	8.80			ug/kg	*8.00*		*110*	*44-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BMI0473 - EPA 8082A

Instrument: ECD5 Analyst: AA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0473-BS1)				Prepared: 23-Sep-2024 Analyzed: 30-Sep-2024 10:30							
Aroclor 1016 [2C]	91.7	2.0	4.0	ug/kg	101		90.9	56-120			
Aroclor 1260 [2C]	114	2.0	4.0	ug/kg	101		113	58-120			
Surrogate: Decachlorobiphenyl	9.49			ug/kg	*8.00*		*119*	*40-126*			
Surrogate: Tetrachlorometaxylene	8.93			ug/kg	*8.00*		*112*	*44-120*			
Surrogate: Decachlorobiphenyl [2C]	10.6			ug/kg	*8.00*		*133*	*40-126*			*
Surrogate: Tetrachlorometaxylene [2C]	8.83			ug/kg	*8.00*		*110*	*44-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BMI0473 - EPA 8082A

Instrument: ECD5 Analyst: AA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BMI0473-BSD1)					Prepared: 23-Sep-2024 Analyzed: 30-Sep-2024 10:51						
Aroclor 1016	90.1	2.0	4.0	ug/kg	101		89.3	56-120	1.11	30	
Aroclor 1260 [2C]	106	2.0	4.0	ug/kg	101		105	58-120	7.80	30	
Surrogate: Decachlorobiphenyl	8.83			ug/kg	*8.00*		*110*	*40-126*			
Surrogate: Tetrachlorometaxylene	8.39			ug/kg	*8.00*		*105*	*44-120*			
Surrogate: Decachlorobiphenyl [2C]	10.0			ug/kg	*8.00*		*125*	*40-126*			
Surrogate: Tetrachlorometaxylene [2C]	8.40			ug/kg	*8.00*		*105*	*44-120*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BMI0473 - EPA 8082A

Instrument: ECD5 Analyst: AA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0473-MS1)	**Source: 24I0364-91**			Prepared: 23-Sep-2024 Analyzed: 30-Sep-2024 11:12							
Aroclor 1016	85.2	2.0	4.0	ug/kg	101	ND	84.5	56-120			
Aroclor 1260	91.3	2.0	4.0	ug/kg	101	ND	90.5	58-120			
Surrogate: Decachlorobiphenyl	8.42			ug/kg	*8.00*		*105*	*40-126*			
Surrogate: Tetrachlorometaxylene	8.18			ug/kg	*8.00*		*102*	*44-120*			
Surrogate: Decachlorobiphenyl [2C]	9.35			ug/kg	*8.00*		*117*	*40-126*			
Surrogate: Tetrachlorometaxylene [2C]	8.15			ug/kg	*8.00*		*102*	*44-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Aroclor PCB - Quality Control

Batch BMI0473 - EPA 8082A

Instrument: ECD5 Analyst: AA

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BMI0473-MSD1)	**Source: 24I0364-91**			Prepared: 23-Sep-2024 Analyzed: 30-Sep-2024 11:33							
Aroclor 1016	83.8	2.0	4.0	ug/kg	101	ND	83.0	56-120	1.76	30	
Aroclor 1260	95.8	2.0	4.0	ug/kg	101	ND	94.9	58-120	4.82	30	
Surrogate: Decachlorobiphenyl	8.39			ug/kg	*8.00*		*105*	*40-126*			
Surrogate: Tetrachlorometaxylene	7.84			ug/kg	*8.00*		*98.0*	*44-120*			
Surrogate: Decachlorobiphenyl [2C]	9.37			ug/kg	*8.00*		*117*	*40-126*			
Surrogate: Tetrachlorometaxylene [2C]	7.71			ug/kg	*8.00*		*96.3*	*44-120*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Dioxins/Furans - Quality Control

Batch BMI0462 - EPA 1613B

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0462-BLK1)				Prepared: 09-Oct-2024 Analyzed: 01-Nov-2024 11:48							
2,3,7,8-TCDF		0.655-0.886	0.615	0.999	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.552	0.999	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.542	0.999	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.575	0.999	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.903	0.999	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.440	0.999	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.411	0.999	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.461	0.999	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.601	0.999	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.768	0.999	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.767	0.999	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.833	0.999	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF		0.893-1.208	0.352	0.999	ND	ng/kg					U
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.614	0.999	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD		0.893-1.208	0.849	2.50	ND	ng/kg					U
OCDF		0.757-1.024	0.793	2.50	ND	ng/kg					U
OCDD	1.546	0.757-1.024		9.99	0.708	ng/kg					EMPC, J
Homologue group											
Total TCDF				0.999	ND	ng/kg					U
Total TCDD				0.999	ND	ng/kg					U
Total PeCDF				0.999	ND	ng/kg					U
Total PeCDD				0.999	ND	ng/kg					U
Total HxCDF				0.999	ND	ng/kg					U
Total HxCDD				0.999	ND	ng/kg					U
Total HpCDF				0.999	ND	ng/kg					U
Total HpCDD				0.999	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):	0.54
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):	0.00
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND):	0.54
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND):	0.00

Labeled compounds				
13C12-2,3,7,8-TCDF	*0.775*	*0.655-0.886*	*60.0*	*24-169 %*
13C12-2,3,7,8-TCDD	*0.837*	*0.655-0.886*	*59.2*	*25-164 %*
13C12-1,2,3,7,8-PeCDF	*1.667*	*1.318-1.783*	*66.8*	*24-185 %*
13C12-2,3,4,7,8-PeCDF	*1.619*	*1.318-1.783*	*56.9*	*21-178 %*

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Dioxins/Furans - Quality Control

Batch BMI0462 - EPA 1613B

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0462-BLK1)				Prepared: 09-Oct-2024	Analyzed: 01-Nov-2024 11:48						
13C12-1,2,3,7,8-PeCDD	*1.637*	*1.318-1.783*			*58.4*			*25-181 %*			
13C12-1,2,3,4,7,8-HxCDF	*0.518*	*0.434-0.587*			*72.7*			*26-152 %*			
13C12-1,2,3,6,7,8-HxCDF	*0.555*	*0.434-0.587*			*83.2*			*26-123 %*			
13C12-2,3,4,6,7,8-HxCDF	*0.577*	*0.434-0.587*			*75.1*			*28-136 %*			
13C12-1,2,3,7,8,9-HxCDF	*0.531*	*0.434-0.587*			*69.6*			*29-147 %*			
13C12-1,2,3,4,7,8-HxCDD	*1.238*	*1.054-1.426*			*64.1*			*32-141 %*			
13C12-1,2,3,6,7,8-HxCDD	*1.229*	*1.054-1.426*			*73.0*			*28-130 %*			
13C12-1,2,3,4,6,7,8-HpCDF	*0.482*	*0.374-0.506*			*83.5*			*28-143 %*			
13C12-1,2,3,4,7,8,9-HpCDF	*0.394*	*0.374-0.506*			*73.3*			*26-138 %*			
13C12-1,2,3,4,6,7,8-HpCDD	*1.031*	*0.893-1.208*			*89.3*			*23-140 %*			
13C12-OCDD	*0.843*	*0.757-1.024*			*89.2*			*17-157 %*			
37Cl4-2,3,7,8-TCDD					*65.0*			*35-197 %*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Dioxins/Furans - Quality Control

Batch BMI0462 - EPA 1613B

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BMI0462-BS1)				Prepared: 09-Oct-2024	Analyzed: 01-Nov-2024 12:38						
2,3,7,8-TCDF	0.725	0.655-0.886		1.00	17.4	ng/kg	86.9	75-158 %			
2,3,7,8-TCDD	0.688	0.655-0.886		1.00	18.1	ng/kg	90.6	67-158 %			
1,2,3,7,8-PeCDF	1.585	1.318-1.783		1.00	100	ng/kg	100	80-134 %			
2,3,4,7,8-PeCDF	1.743	1.318-1.783		1.00	95.1	ng/kg	95.1	68-160 %			
1,2,3,7,8-PeCDD	1.435	1.318-1.783		1.00	95.1	ng/kg	95.1	70-142 %			
1,2,3,4,7,8-HxCDF	1.198	1.054-1.426		1.00	96.6	ng/kg	96.6	72-134 %			
1,2,3,6,7,8-HxCDF	1.083	1.054-1.426		1.00	99.1	ng/kg	99.1	84-130 %			
2,3,4,6,7,8-HxCDF	1.200	1.054-1.426		1.00	96.4	ng/kg	96.4	70-156 %			
1,2,3,7,8,9-HxCDF	1.217	1.054-1.426		1.00	99.6	ng/kg	99.6	78-130 %			
1,2,3,4,7,8-HxCDD	1.243	1.054-1.426		1.00	111	ng/kg	111	70-164 %			
1,2,3,6,7,8-HxCDD	1.420	1.054-1.426		1.00	112	ng/kg	112	76-134 %			
1,2,3,7,8,9-HxCDD	1.376	1.054-1.426		1.00	118	ng/kg	118	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.935	0.893-1.208		1.00	95.5	ng/kg	95.5	82-122 %			
1,2,3,4,7,8,9-HpCDF	1.046	0.893-1.208		1.00	94.7	ng/kg	94.7	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.050	0.893-1.208		2.50	93.4	ng/kg	93.4	70-140 %			
OCDF	0.823	0.757-1.024		2.50	179	ng/kg	89.6	63-170 %			
OCDD	0.900	0.757-1.024		10.0	204	ng/kg	102	78-144 %			B
Labeled compounds											
13C12-2,3,7,8-TCDF	*0.760*	*0.655-0.886*			*57.6*			*24-169 %*			
13C12-2,3,7,8-TCDD	*0.757*	*0.655-0.886*			*60.5*			*25-164 %*			
13C12-1,2,3,7,8-PeCDF	*1.593*	*1.318-1.783*			*66.4*			*24-185 %*			
13C12-2,3,4,7,8-PeCDF	*1.702*	*1.318-1.783*			*73.0*			*21-178 %*			
13C12-1,2,3,7,8-PeCDD	*1.620*	*1.318-1.783*			*71.5*			*25-181 %*			
13C12-1,2,3,4,7,8-HxCDF	*0.522*	*0.434-0.587*			*76.3*			*26-152 %*			
13C12-1,2,3,6,7,8-HxCDF	*0.519*	*0.434-0.587*			*90.0*			*26-123 %*			
13C12-2,3,4,6,7,8-HxCDF	*0.527*	*0.434-0.587*			*82.5*			*28-136 %*			
13C12-1,2,3,7,8,9-HxCDF	*0.505*	*0.434-0.587*			*80.6*			*29-147 %*			
13C12-1,2,3,4,7,8-HxCDD	*1.273*	*1.054-1.426*			*69.7*			*32-141 %*			
13C12-1,2,3,6,7,8-HxCDD	*1.229*	*1.054-1.426*			*79.9*			*28-130 %*			
13C12-1,2,3,4,6,7,8-HpCDF	*0.479*	*0.374-0.506*			*82.1*			*28-143 %*			
13C12-1,2,3,4,7,8,9-HpCDF	*0.402*	*0.374-0.506*			*86.2*			*26-138 %*			
13C12-1,2,3,4,6,7,8-HpCDD	*1.003*	*0.893-1.208*			*96.2*			*23-140 %*			
13C12-OCDD	*0.856*	*0.757-1.024*			*83.8*			*17-157 %*			
37Cl4-2,3,7,8-TCDD					*61.8*			*35-197 %*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Dioxins/Furans - Quality Control

Batch BMI0462 - EPA 1613B

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BMI0462-DUP1)		**Source: 24I0364-01**		Prepared: 09-Oct-2024	Analyzed: 01-Nov-2024 13:41						
2,3,7,8-TCDF		0.655-0.886	0.558	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.365	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.440	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.411	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.716	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.635	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.551	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.680	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.898	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	1.00	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.957	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	1.06	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.129	0.893-1.208		1.00	1.81	ng/kg			4.35	25	
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.574	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	0.963	0.893-1.208		2.50	22.0	ng/kg			13.70	25	
OCDF		0.757-1.024	0.927	2.50	ND	ng/kg					U
OCDD	0.869	0.757-1.024		10.0	150	ng/kg			1.04	25	B
Homologue group											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	1.39	ng/kg			24.30	200	
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	1.81	ng/kg			78.30	200	
Total HpCDD				1.00	33.7	ng/kg			5.39	200	
Labeled compounds											
13C12-2,3,7,8-TCDF	*0.822*	*0.655-0.886*			*60.1*			*24-169 %*			
13C12-2,3,7,8-TCDD	*0.776*	*0.655-0.886*			*60.5*			*25-164 %*			
13C12-1,2,3,7,8-PeCDF	*1.579*	*1.318-1.783*			*76.8*			*24-185 %*			
13C12-2,3,4,7,8-PeCDF	*1.557*	*1.318-1.783*			*73.1*			*21-178 %*			
13C12-1,2,3,7,8-PeCDD	*1.725*	*1.318-1.783*			*71.5*			*25-181 %*			
13C12-1,2,3,4,7,8-HxCDF	*0.517*	*0.434-0.587*			*66.5*			*26-152 %*			
13C12-1,2,3,6,7,8-HxCDF	*0.464*	*0.434-0.587*			*80.4*			*26-123 %*			
13C12-2,3,4,6,7,8-HxCDF	*0.513*	*0.434-0.587*			*70.0*			*28-136 %*			
13C12-1,2,3,7,8,9-HxCDF	*0.542*	*0.434-0.587*			*72.9*			*29-147 %*			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Dioxins/Furans - Quality Control

Batch BMI0462 - EPA 1613B

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
Duplicate (BMI0462-DUP1)		**Source: 24I0364-01**		Prepared: 09-Oct-2024	Analyzed: 01-Nov-2024 13:41						
13C12-1,2,3,4,7,8-HxCDD	*1.249*	*1.054-1.426*					*60.0*			*32-141 %*	
13C12-1,2,3,6,7,8-HxCDD	*1.230*	*1.054-1.426*					*68.0*			*28-130 %*	
13C12-1,2,3,4,6,7,8-HpCDF	*0.428*	*0.374-0.506*					*69.4*			*28-143 %*	
13C12-1,2,3,4,7,8,9-HpCDF	*0.465*	*0.374-0.506*					*72.8*			*26-138 %*	
13C12-1,2,3,4,6,7,8-HpCDD	*1.015*	*0.893-1.208*					*81.8*			*23-140 %*	
13C12-OCDD	*0.893*	*0.757-1.024*					*84.3*			*17-157 %*	
37Cl4-2,3,7,8-TCDD							*72.0*			*35-197 %*	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BMI0484 - EPA 6020B

Instrument: ICPMS1 Analyst: HAL

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0484-BLK1)					Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 18:00							
Chromium	52	ND	0.26	0.50	mg/kg							U
Chromium	53	ND	0.24	0.50	mg/kg							U
Lead	208	ND	0.05	0.10	mg/kg							U
Silver	107	ND	0.02	0.20	mg/kg							U
Arsenic	75a	ND	0.04	0.20	mg/kg							U
Cadmium	111	ND	0.03	0.10	mg/kg							U
Copper	63	ND	0.17	0.50	mg/kg							U
Copper	65	ND	0.35	0.50	mg/kg							U
Zinc	66	ND	2.9	6.0	mg/kg							U
Zinc	67	ND	0.9	6.0	mg/kg							U
LCS (BMI0484-BS1)					Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 18:05							
Chromium	52	24.7	0.26	0.50	mg/kg	25.0		98.9	80-120			
Chromium	53	25.2	0.24	0.50	mg/kg	25.0		101	80-120			
Lead	208	24.6	0.05	0.10	mg/kg	25.0		98.4	80-120			
Silver	107	24.2	0.02	0.20	mg/kg	25.0		96.7	80-120			
Arsenic	75a	24.0	0.04	0.20	mg/kg	25.0		96.0	80-120			
Cadmium	111	24.1	0.03	0.10	mg/kg	25.0		96.3	80-120			
Copper	63	26.0	0.17	0.50	mg/kg	25.0		104	80-120			
Copper	65	25.5	0.35	0.50	mg/kg	25.0		102	80-120			
Zinc	66	78.9	2.9	6.0	mg/kg	80.0		98.6	80-120			
Zinc	67	74.4	0.9	6.0	mg/kg	80.0		93.0	80-120			
Duplicate (BMI0484-DUP1)			**Source: 24I0364-05**		Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 18:20							
Lead	208	4.41	0.08	0.15	mg/kg		3.20			31.90	20	*
Silver	107	0.11	0.03	0.31	mg/kg		0.09			24.20	20	L, J
Arsenic	75a	4.18	0.06	0.31	mg/kg		3.35			22.10	20	*
Cadmium	111	0.25	0.05	0.15	mg/kg		0.18			35.10	20	L
Copper	65	38.1	0.54	0.77	mg/kg		32.8			14.80	20	
Zinc	66	90.7	4.5	9.2	mg/kg		82.0			10.10	20	
Duplicate (BMI0484-DUP2)			**Source: 24I0364-05**		Prepared: 20-Sep-2024 Analyzed: 27-Sep-2024 20:15							
Chromium	52	20.1	2.00	3.85	mg/kg		14.9			29.80	20	*, D
Matrix Spike (BMI0484-MS1)			**Source: 24I0364-05**		Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 18:25							
Lead	208	40.1	0.08	0.15	mg/kg	38.5	3.20	95.8	75-125			
Silver	107	34.2	0.03	0.31	mg/kg	38.5	0.09	88.7	75-125			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BMI0484 - EPA 6020B UCT-KED

Instrument: ICPMS1 Analyst: HAL

QC Sample/Analyte	Isotope	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BMI0484-MS1)			**Source: 24I0364-05**			Prepared: 20-Sep-2024		Analyzed: 23-Sep-2024 18:25				
Arsenic	75a	41.4	0.06	0.31	mg/kg	38.5	3.35	98.9	75-125			
Cadmium	111	38.4	0.05	0.15	mg/kg	38.5	0.18	99.3	75-125			
Copper	65	78.5	0.54	0.77	mg/kg	38.5	32.8	119	75-125			
Zinc	66	218	4.5	9.2	mg/kg	123	82.0	110	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike (BMI0484-MS2)			**Source: 24I0364-05**			Prepared: 20-Sep-2024		Analyzed: 27-Sep-2024 20:20				
Chromium	52	44.8	2.00	3.85	mg/kg	38.5	14.9	77.6	75-125			D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BMI0484-MSD1)			**Source: 24I0364-05**			Prepared: 20-Sep-2024		Analyzed: 23-Sep-2024 18:30				
Lead	208	39.9	0.08	0.15	mg/kg	38.5	3.20	95.4	75-125	0.38	20	
Silver	107	35.9	0.03	0.31	mg/kg	38.5	0.09	93.1	75-125	4.75	20	
Arsenic	75a	41.4	0.06	0.31	mg/kg	38.5	3.35	98.9	75-125	0.02	20	
Cadmium	111	38.0	0.05	0.15	mg/kg	38.5	0.18	98.3	75-125	0.95	20	
Copper	65	77.4	0.54	0.77	mg/kg	38.5	32.8	116	75-125	1.43	20	
Zinc	66	214	4.5	9.2	mg/kg	123	82.0	107	75-125	1.84	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Matrix Spike Dup (BMI0484-MSD2)			**Source: 24I0364-05**			Prepared: 20-Sep-2024		Analyzed: 27-Sep-2024 20:25				
Chromium	52	49.9	2.00	3.85	mg/kg	38.5	14.9	90.9	75-125	10.80	20	D
Recovery limits for target analytes in MS/MSD QC samples are advisory only.												
Reference (BMI0484-SRM1)						Prepared: 20-Sep-2024		Analyzed: 23-Sep-2024 18:40				
Chromium	52	175	0.65	1.24	mg/kg	154		113	70-125			D
Chromium	53	177	0.60	1.24	mg/kg	154		115	70-125			D
Lead	208	216	0.13	0.25	mg/kg	217		99.7	0-200			D
Silver	107	58.6	0.05	0.50	mg/kg	57.4		102	0-200			D
Arsenic	75a	161	0.09	0.50	mg/kg	144		112	0-200			D
Cadmium	111	185	0.07	0.25	mg/kg	163		113	0-200			D
Copper	63	201	0.43	1.24	mg/kg	185		109	0-200			D
Copper	65	204	0.87	1.24	mg/kg	185		110	0-200			D
Zinc	66	241	7.3	14.9	mg/kg	227		106	0-200			D
Zinc	67	252	2.3	14.9	mg/kg	227		111	0-200			D

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BMI0650 - EPA 7471B

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0650-BLK1)				Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 12:31							
Mercury	ND	0.00525	0.0250	mg/kg							U
LCS (BMI0650-BS1)				Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 12:33							
Mercury	0.462	0.00525	0.0250	mg/kg	0.500		92.4	80-120			
Duplicate (BMI0650-DUP1)		**Source: 24I0364-05**		Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 13:46							
Mercury	0.0146	0.00715	0.0340	mg/kg		0.0666			128.00	20	*, J
Matrix Spike (BMI0650-MS1)		**Source: 24I0364-05**		Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 13:48							
Mercury	0.361	0.00709	0.0337	mg/kg	0.337	0.0666	87.2	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BMI0650-MSD1)		**Source: 24I0364-05**		Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 13:50							
Mercury	0.380	0.00721	0.0343	mg/kg	0.343	0.0666	91.3	75-125	5.14	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Reference (BMI0650-SRM1)				Prepared: 26-Sep-2024 Analyzed: 01-Oct-2024 13:53							
Mercury	17.2	0.102	0.485	mg/kg	20.0		86.3	70-125			D

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BMI0526 - EPA 9060A m

Instrument: TOC Cube Analyst: ARR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0526-BLK1)					Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 18:07						
Total Organic Carbon	ND	0.02	0.02	%							U
LCS (BMI0526-BS1)					Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 19:07						
Total Organic Carbon	45.5	0.02	0.02	%	44.4		102	80-120			
Duplicate (BMI0526-DUP1)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 21:08						
Total Organic Carbon	6.86	0.02	0.02	%		11.6			51.10	20	*
Duplicate (BMI0526-DUP2)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 21:39						
Total Organic Carbon	15.6	0.02	0.02	%		11.6			29.50	20	*
Duplicate (BMI0526-DUP3)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 03-Oct-2024 21:29						
Total Organic Carbon	8.89	0.02	0.02	%		11.6			26.20	20	*
Duplicate (BMI0526-DUP4)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 03-Oct-2024 21:59						
Total Organic Carbon	11.7	0.02	0.02	%		11.6			1.15	20	
Matrix Spike (BMI0526-MS1)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 22:09						
Total Organic Carbon	31.9	0.02	0.02	%	20.2	11.6	101	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Matrix Spike Dup (BMI0526-MSD1)		**Source: 24I0364-04**			Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 22:39						
Total Organic Carbon	33.8	0.02	0.02	%	20.6	11.6	108	75-125	5.80	20	
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
Reference (BMI0526-SRM1)					Prepared: 20-Sep-2024 Analyzed: 23-Sep-2024 20:08						
Total Organic Carbon	4.53	0.02	0.02	%	4.46		102	50-150			

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Analysis by: Analytical Resources, LLC

Wet Chemistry - Quality Control

Batch BMI0559 - SM 2540 G-11

Instrument: BAL2 Analyst: LM

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BMI0559-BLK1)				Prepared: 23-Sep-2024 Analyzed: 23-Sep-2024 09:43							
Total Solids	ND	0.04	0.04	%							U
Duplicate (BMI0559-DUP1)		**Source: 24I0364-04**		Prepared: 23-Sep-2024 Analyzed: 23-Sep-2024 09:43							
Total Solids	58.94	0.04	0.04	%		61.04			3.50	20	
Duplicate (BMI0559-DUP2)		**Source: 24I0364-04**		Prepared: 23-Sep-2024 Analyzed: 23-Sep-2024 09:43							
Total Solids	62.04	0.04	0.04	%		61.04			1.63	20	

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Certified Analyses included in this Report

Analyte	Certifications
EPA 1613B in Solid	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP
13C12-2,3,7,8-TCDD	DoD-ELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP
13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP
13C12-OCDD	DoD-ELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP
EPA 6020B in Solid	
Silver-107	NELAP,DoD-ELAP,WADOE
Chromium-52	NELAP,DoD-ELAP,WADOE,ADEC
Chromium-53	NELAP,DoD-ELAP,WADOE,ADEC
Lead-208	NELAP,DoD-ELAP,WADOE,ADEC
EPA 6020B UCT-KED in Solid	
Arsenic-75a	NELAP,DoD-ELAP,WADOE,ADEC
Cadmium-111	NELAP,DoD-ELAP,WADOE,ADEC
Copper-63	NELAP,DoD-ELAP,WADOE
Copper-65	NELAP,DoD-ELAP,WADOE
Zinc-66	NELAP,DoD-ELAP,WADOE
Zinc-67	NELAP,DoD-ELAP,WADOE
EPA 7471B in Solid	
Mercury	WADOE,NELAP,DoD-ELAP
EPA 8082A in Solid	
Aroclor 1016	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1016 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1221 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1232 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1242	WADOE,DoD-ELAP,NELAP,ADEC

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Aroclor 1242 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1248 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1254 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1260 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1262 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268	WADOE,DoD-ELAP,NELAP,ADEC
Aroclor 1268 [2C]	WADOE,DoD-ELAP,NELAP,ADEC
EPA 8270E in Solid	
Phenol	DoD-ELAP,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,NELAP,WADOE
Benzyl Alcohol	DoD-ELAP,NELAP,WADOE
2-Methylphenol	DoD-ELAP,NELAP,WADOE
4-Methylphenol	DoD-ELAP,NELAP,WADOE
2,4-Dimethylphenol	DoD-ELAP,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,NELAP,WADOE
Naphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Benzoic acid	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
2-Methylnaphthalene	DoD-ELAP,NELAP,WADOE,ADEC
Acenaphthylene	DoD-ELAP,NELAP,WADOE,ADEC
Dimethylphthalate	DoD-ELAP,NELAP,WADOE
Acenaphthene	DoD-ELAP,NELAP,WADOE,ADEC
Dibenzofuran	DoD-ELAP,NELAP,WADOE,ADEC
Fluorene	DoD-ELAP,NELAP,WADOE,ADEC
Diethyl phthalate	DoD-ELAP,NELAP,WADOE
N-Nitrosodiphenylamine	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Pentachlorophenol	DoD-ELAP,NELAP,WADOE

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Phenanthrene	DoD-ELAP,NELAP,WADOE,ADEC
Anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Di-n-Butylphthalate	DoD-ELAP,NELAP,WADOE
Fluoranthene	DoD-ELAP,NELAP,WADOE,ADEC
Pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Butylbenzylphthalate	DoD-ELAP,NELAP,WADOE
Benzo(a)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Chrysene	DoD-ELAP,NELAP,WADOE,ADEC
bis(2-Ethylhexyl)phthalate	DoD-ELAP,NELAP,WADOE
Di-n-Octylphthalate	DoD-ELAP,NELAP,WADOE
Benzofluoranthenes, Total	WADOE,ADEC
Benzo(a)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Indeno(1,2,3-cd)pyrene	DoD-ELAP,NELAP,WADOE,ADEC
Dibenzo(a,h)anthracene	DoD-ELAP,NELAP,WADOE,ADEC
Benzo(g,h,i)perylene	DoD-ELAP,NELAP,WADOE,ADEC

EPA 8270E-SIM in Solid

Phenol	NELAP,WADOE
1,4-Dichlorobenzene	NELAP,WADOE
1,2-Dichlorobenzene	NELAP,WADOE
Benzyl Alcohol	NELAP,WADOE
2-Methylphenol	NELAP,WADOE
4-Methylphenol	NELAP,WADOE
2,4-Dimethylphenol	NELAP,WADOE
1,2,4-Trichlorobenzene	NELAP,WADOE
Hexachlorobutadiene	NELAP,WADOE
Dimethylphthalate	NELAP,WADOE
Diethyl phthalate	NELAP,WADOE
N-Nitrosodiphenylamine	NELAP,WADOE
Hexachlorobenzene	NELAP,WADOE
Pentachlorophenol	NELAP,WADOE
Butylbenzylphthalate	NELAP,WADOE
Dibenzo(a,h)anthracene	NELAP,WADOE

EPA 9060A m in Solid

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Total Organic Carbon	NELAP,WADOE
NWTPH-Dx in Solid	
Diesel Range Organics (C12-C2	DoD-ELAP,NELAP,WADOE
Motor Oil Range Organics (C24-	DoD-ELAP,NELAP,WADOE
NWTPHg in Solid	
Gasoline Range Organics (Tol-N	DoD-ELAP
NWTPHg in Water	
Gasoline Range Organics (Tol-N	WADOE,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2025
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program, PJLA Testing	66169	02/28/2025
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2025
WADOE	WA Dept of Ecology	C558	06/30/2025
WA-DW	Ecology - Drinking Water	C558	06/30/2025

WSP USA, Inc.	Project: Whitmarsh	
840 HOWE STREET, #1000	Project Number: Whitmarsh	**Reported:**
VANCOUVER BRITISH COLUMBIA, V6Z 2M1	Project Manager: Accounts Payable	06-Nov-2024 16:54

Notes and Definitions

*	Flagged value is not within established control limits.
B	This analyte was detected in the method blank.
D	The reported value is from a dilution
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
EMPC	Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
H	Hold time violation - Hold time was exceeded.
J	Estimated concentration value detected below the reporting limit.
L	Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
X	Indicates possible CDPE interference.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

APPENDIX B

DATA VALIDATION REPORT

Sayler Data Solutions, Inc.
14257 93rd Court NE Kirkland, Washington 98034 (425) 820-7504 cari.say@saylerdata.com

DATA VALIDATION REPORT

Whitmarsh Landfill Import Material Characterization, September 2024 Data

Prepared for:
WSP Environment and Infrastructure, Inc.
3500 188th Street SW, Suite 601
Lynnwood, WA 98037-4763

December 11, 2024

1.0 Introduction

Data set: Data were received in one laboratory sample delivery group (SDG). Data were submitted by Analytical Resources LLC, in Tukwila Washington. Data submissions included both laboratory reports and electronic data deliverable (EDD) as follows:

SDG	EDD File Name	Report File Name	Report Date
24I0364	24I0364 FINAL_11082024.txt	24I0364 CLPLIKE (Rev0).PDF	11/06/24

* The EDD includes 2 files per SDG and date, utilitzing .txt and _standards.txt suffixes.

Analytical methods: Analyses were performed by the following methods:

Analysis	Analysis Method	Preparation Method
Semivolatile Organics Analysis (SV)	SW8270E	SW3546
Semivolatile Organics by SIM Analysis (SV-SIM)	SW8270E-SIM	SW3546
Polychlorinated Biphenyl Aroclors Analysis (PCBa)	SW8082A	SW3546/3660/3665
Gasoline Range Hydrocarbons Analysis (TPHG)	WATPH-G	SW5035
Diesel Range Hydrocarbons Analysis (TPHDx)	NWTPH-Dx	SW3546
Dioxins/Furans Analysis (Dxn)	E1613B	METHOD
ICPMS Metals Analysis (ICPMS)	SW6020B	SW3050B
Mercury Analysis (Hg)	SW7471B	METHOD
Total Solids Analysis (TS)	SM2540G	NONE
Dioxin Total Solids Analysis (TS-D)	D2216	NONE
Total Organic Carbon Analysis (TOC)	SW9060A	NONE

Analytical Schedule: The following sediment samples and field QC samples were included in this review:

Sample ID	Sample Date/Time	Lab IDs	Analyses
20240911-GS-TAT-D-1	09/11/2024 11:25	24I0364-01	Dxn, TS-D
20240911-GS-TAT-PCB-1	09/11/2024 11:25	24I0364-03	SV, SV-SIM, PCBa
20240911-GS-TAT-TOC-1	09/11/2024 11:25	24I0364-04	TOC, TS
20240911-GS-TAT-M-1	09/11/2024 11:25	24I0364-05	ICPMS, Hg
20240911-GS-TAT-D-2	09/11/2024 11:40	24I0364-06	Dxn, TS-D
20240911-GS-TAT-PCB-2	09/11/2024 11:40	24I0364-08	SV, SV-SIM, PCBa
20240911-GS-TAT-TOC-2	09/11/2024 11:40	24I0364-09	TOC, TS
20240911-GS-TAT-M-2	09/11/2024 11:40	24I0364-10	ICPMS, Hg
20240911-GS-TAT-D-3	09/11/2024 11:55	24I0364-11	Dxn, TS-D
20240911-GS-TAT-PCB-3	09/11/2024 11:55	24I0364-13	SV, SV-SIM, PCBa

Sample ID	Sample Date/Time	Lab IDs	Analyses
20240911-GS-TAT-TOC-3	09/11/2024 11:55	24I0364-14	TOC, TS
20240911-GS-TAT-M-3	09/11/2024 11:55	24I0364-15	ICPMS, Hg
20240911-GS-C-D-1	09/11/2024 12:25	24I0364-16	Dxn, TS-D
20240911-GS-C-PCB-1	09/11/2024 12:25	24I0364-18	SV, SV-SIM, PCBa
20240911-GS-C-TOC-1	09/11/2024 12:25	24I0364-19	TOC, TS
20240911-GS-C-M-1	09/11/2024 12:25	24I0364-20	ICPMS, Hg
20240911-GS-C-D-2	09/11/2024 12:40	24I0364-21	Dxn, TS-D
20240911-GS-C-PCB-2	09/11/2024 12:40	24I0364-23	SV, SV-SIM, PCBa
20240911-GS-C-TOC-2	09/11/2024 12:40	24I0364-24	TOC, TS
20240911-GS-C-M-2	09/11/2024 12:40	24I0364-25	ICPMS, Hg
20240911-GS-C-D-3	09/11/2024 12:50	24I0364-26	Dxn, TS-D
20240911-GS-C-PCB-3	09/11/2024 12:50	24I0364-28	SV, SV-SIM, PCBa
20240911-GS-C-TOC-3	09/11/2024 12:50	24I0364-29	TOC, TS
20240911-GS-C-M-3	09/11/2024 12:50	24I0364-30	ICPMS, Hg
20240911-SBT-C-D-1	09/11/2024 15:10	24I0364-31	Dxn, TS-D
20240911-SBT-C-PCB-1	09/11/2024 15:10	24I0364-33	SV, SV-SIM, PCBa
20240911-SBT-C-TOC-1	09/11/2024 15:10	24I0364-34	TOC, TS
20240911-SBT-C-M-1	09/11/2024 15:10	24I0364-35	ICPMS, Hg
20240911-SBT-C-D-2	09/11/2024 15:20	24I0364-36	Dxn, TS-D
20240911-SBT-C-PCB-2	09/11/2024 15:20	24I0364-38	SV, SV-SIM, PCBa
20240911-SBT-C-TOC-2	09/11/2024 15:20	24I0364-39	TOC, TS
20240911-SBT-C-M-2	09/11/2024 15:20	24I0364-40	ICPMS, Hg
20240911-SBT-C-D-3	09/11/2024 15:30	24I0364-41	Dxn, TS-D
20240911-SBT-C-PCB-3	09/11/2024 15:30	24I0364-43	SV, SV-SIM, PCBa
20240911-SBT-C-TOC-3	09/11/2024 15:30	24I0364-44	TOC, TS
20240911-SBT-C-M-3	09/11/2024 15:30	24I0364-45	ICPMS, Hg
20240911-SBT-TAT-D-1	09/11/2024 16:00	24I0364-46	Dxn, TS-D
20240911-SBT-TAT-PCB-1	09/11/2024 16:00	24I0364-48	SV, SV-SIM, PCBa
20240911-SBT-TAT-TOC-1	09/11/2024 16:00	24I0364-49	TOC, TS
20240911-SBT-TAT-M-1	09/11/2024 16:00	24I0364-50	ICPMS, Hg
20240911-SBT-TAT-D-2	09/11/2024 16:10	24I0364-51	Dxn, TS-D
20240911-SBT-TAT-PCB-2	09/11/2024 16:10	24I0364-53	SV, SV-SIM, PCBa
20240911-SBT-TAT-TOC-2	09/11/2024 16:10	24I0364-54	TOC, TS
20240911-SBT-TAT-M-2	09/11/2024 16:10	24I0364-55	ICPMS, Hg
20240911-SBT-TAT-D-3	09/11/2024 16:20	24I0364-56	Dxn, TS-D
20240911-SBT-TAT-PCB-3	09/11/2024 16:20	24I0364-58	SV, SV-SIM, PCBa
20240911-SBT-TAT-TOC-3	09/11/2024 16:20	24I0364-59	TOC, TS
20240911-SBT-TAT-M-3	09/11/2024 16:20	24I0364-60	ICPMS, Hg
20240912-G-CB-Dx/A-1	09/12/2024 08:35	24I0364-61	TPHDx
20240912-G-CB-TPHG-1	09/12/2024 08:35	24I0364-62	TPHG
20240912-G-CB-M-1	09/12/2024 08:35	24I0364-63	ICPMS, Hg
20240912-G-CB-Dx/A-2	09/12/2024 08:50	24I0364-64	TPHDx
20240912-G-CB-TPHG-2	09/12/2024 08:50	24I0364-65	TPHG
20240912-G-CB-M-2	09/12/2024 08:50	24I0364-66	ICPMS, Hg
20240912-G-CB-Dx/A-3	09/12/2024 09:10	24I0364-67	TPHDx
20240912-G-CB-TPHG-3	09/12/2024 09:10	24I0364-68	TPHG
20240912-G-CB-M-3	09/12/2024 09:10	24I0364-69	ICPMS, Hg
20240912-MSG-CB-Dx-1	09/12/2024 11:15	24I0364-70	TPHDx
20240912-MSG-CB-TPHG-1	09/12/2024 11:15	24I0364-71	TPHG
20240912-MSG-CB-M-1	09/12/2024 11:15	24I0364-72	ICPMS, Hg
20240912-MSG-CB-Dx-2	09/12/2024 11:35	24I0364-73	TPHDx
20240912-MSG-CB-TPHG-2	09/12/2024 11:35	24I0364-74	TPHG
20240912-MSG-CB-M-2	09/12/2024 11:35	24I0364-75	ICPMS, Hg
20240912-MSG-CB-Dx-3	09/12/2024 11:50	24I0364-76	TPHDx
20240912-MSG-CB-TPHG-3	09/12/2024 11:50	24I0364-77	TPHG
20240912-MSG-CB-M-3	09/12/2024 11:50	24I0364-78	ICPMS, Hg
20240912-MSG-CB-TOC-3	09/12/2024 11:50	24I0364-79	TOC, TS
20240912-MSG-CB-PCB-1	09/12/2024 11:15	24I0364-80	SV, SV-SIM, PCBa

Sample ID	Sample Date/Time	Lab IDs	Analyses
20240912-MSG-CB-PCB-2	09/12/2024 11:35	24I0364-81	SV, SV-SIM, PCBa
20240912-MSG-CB-PCB-3	09/12/2024 11:50	24I0364-82	SV, SV-SIM, PCBa
20240912-MSG-CB-TOC-1	09/12/2024 11:15	24I0364-86	TOC, TS
20240912-MSG-CB-TOC-2	09/12/2024 11:35	24I0364-87	TOC, TS
20240912-G-CB-TOC-1	09/12/2024 08:35	24I0364-88	TOC, TS
20240912-G-CB-TOC-2	09/12/2024 08:50	24I0364-89	TOC, TS
20240912-G-CB-TOC-3	09/12/2024 09:10	24I0364-90	TOC, TS
20240912-G-CB-PCB-1	09/12/2024 08:35	24I0364-91	SV, SV-SIM, PCBa
20240912-G-CB-PCB-2	09/12/2024 08:50	24I0364-92	SV, SV-SIM, PCBa
20240912-G-CB-PCB-3	09/12/2024 09:10	24I0364-93	SV, SV-SIM, PCBa
Trip Blanks	09/11/2024 11:25	24I0364-94	TPHG

2.0 Validation

Results were evaluated based on criteria from the analytical methods, project documents, and current EPA guidance documents. References for these documents are listed in section 7.0 of this report. The criteria gathered from the above documents are briefly summarized in the Appendix “Data Validation Criteria” at the end of this report.

A stage 4 validation was performed on the dioxin/furan analysis and a stage 2B validation was performed on the remaining analyses. Validation included both the laboratory report and electronic data deliverable (EDD), earning EPA OSWER validation label code S4VEM or S2BVEM. All validation was performed by Cari Sayler.

Data qualifiers are summarized in section 5.0 of this report and added to the validated EDD.

3.0 Validation Findings

Data validation criteria specified in the appendix were met except as noted below:

Issues resulting in qualification:

- One initial calibration RSD exceeded the control limit in the semivolatile analysis. Associated positive and non-detect results are qualified as estimated. The specific exceedance is shown below:

Analysis	Standard ID	Analysis Date/Time	Analyte	Column	RSD	Control Limit
SV	HI00071	09/19/2024 09:00	Acenaphthylene	1C	38.8	20

- % Recoveries for individual standards in the semivolatile and semivolatile SIM initial calibration standards were not tabulated by the laboratory and could not be reviewed. Relative response factors were evaluated to identify potential problems, and individual recoveries for Pentachlorophenol in the semivolatile calibration were manually calculated, with two individual recovery exceedances noted. Associated non-detect sample results and detected sample results within two times the reporting limit are qualified as estimated. Specific exceedances are shown below:

Analysis	Standard ID	Analysis Date/Time	Analyte	% Recovery	Std Type	Control Limit
SV	SMI0299-CAL3	09/19/2024 16:35	Pentachlorophenol	30.5	ICAL	50-150
SV	SMI0299-CAL4	09/19/2024 15:55	Pentachlorophenol	66.8	ICAL	70-130

➢ Sample holding times exceeded the QAPP-specified holding time of 14 days for total organic carbon. The affected sample results are qualified as estimated. The specific exceedances are shown below:

Analysis	Sample ID	Days, Sample to Analysis	Analysis Hold time
TOC	20240912-G-CB-TOC-3	15	14
TOC	20240912-G-CB-TOC-2	15	14
TOC	20240912-G-CB-TOC-1	15	14
TOC	20240911-SBT-TAT-TOC-3	15	14
TOC	20240911-SBT-TAT-TOC-2	15	14
TOC	20240911-SBT-TAT-TOC-1	15	14
TOC	20240911-SBT-C-TOC-3	15	14
TOC	20240911-SBT-C-TOC-2	15	14
TOC	20240911-SBT-C-TOC-1	15	14
TOC	20240911-GS-C-TOC-3	15	14
TOC	20240911-GS-C-TOC-2	15	14

➢ Calibration verification % recoveries were outside of limits in the semivolatile, semivolatile SIM, and dioxin/furan analyses. Both detect and non-detect sample results associated with low instrument responses are qualified as estimated. Detected sample results associated with high instrument responses are qualified as estimated, and non-detect sample results are considered unaffected. Specific exceedances are shown below:

Analysis	Standard ID	Analysis Date/Time	Analyte	% Recovery	Std Type	Control Limit
SV	SMI0299-SCV1	09/19/2024 19:14	2,4-dimethylphenol	69.4	ICV	70-130
SV	SMI0299-SCV1	09/19/2024 19:14	Benzoic Acid	63.8	ICV	70-130
SV	SMI0299-SCV1	09/19/2024 19:14	Pentachlorophenol	54.4	ICV	70-130
SV	SMI0383-CCV1	09/25/2024 20:33	Benzo(g,h,i)perylene	47.8	CCVe	50-150
SV	SMI0383-CCV1	09/25/2024 20:33	Bis(2-ethylhexyl) phthalate	164.5	CCVe	50-150
SV	SMI0383-ICV1	09/25/2024 11:09	Benzo(g,h,i)perylene	65.4	CCV	80-120
SV	SMI0383-ICV1	09/25/2024 11:09	Dibenzo(a,h)anthracene	75.1	CCV	80-120
SV	SMI0383-ICV1	09/25/2024 11:09	Fluoranthene	78.3	CCV	80-120
SV	SMI0383-ICV1	09/25/2024 11:09	Indeno(1,2,3-cd)pyrene	75.2	CCV	80-120
SV	SMI0411-CCV1	09/26/2024 22:39	Benzo(g,h,i)perylene	43.6	CCVe	50-150
SV	SMI0411-CCV1	09/26/2024 22:39	Bis(2-ethylhexyl) phthalate	155.6	CCVe	50-150
SV	SMI0411-CCV1	09/26/2024 22:39	Dibenzo(a,h)anthracene	49	CCVe	50-150
SV	SMI0430-ICV1	09/27/2024 13:34	Benzoic Acid	77.7	CCV	80-120
SV	SMI0430-ICV1	09/27/2024 13:34	Fluoranthene	62.9	CCV	80-120
SV	SMI0430-ICV1	09/27/2024 13:34	Pyrene	66.6	CCV	80-120
SV-SIM	SMI0439-SCV1	09/27/2024 22:15	2,4-dimethylphenol	68.3	ICV	70-130
SV-SIM	SMJ0155-ICV1	10/11/2024 16:23	Pentachlorophenol	79	CCV	80-120
SV-SIM	SMJ0155-ICV2	10/11/2024 17:01	Pentachlorophenol	73.4	CCV	80-120
SV-SIM	SMJ0155-ICV3	10/12/2024 02:33	Butyl benzyl phthalate	175.9	CCV	80-120
SV-SIM	SMJ0155-ICV3	10/12/2024 02:33	Dibenzo(a,h)anthracene	59.9	CCV	80-120
SV-SIM	SMJ0155-ICV3	10/12/2024 02:33	N-nitrosodiphenylamine	78	CCV	80-120
SV-SIM	SMJ0155-ICV3	10/12/2024 02:33	Pentachlorophenol	73.4	CCV	80-120
SV-SIM	SMJ0155-ICV4	10/12/2024 03:11	Butyl benzyl phthalate	213	CCV	80-120
SV-SIM	SMJ0155-ICV4	10/12/2024 03:11	Dibenzo(a,h)anthracene	66.6	CCV	80-120
SV-SIM	SMJ0155-ICV4	10/12/2024 03:11	Diethyl Phthalate	122.5	CCV	80-120
SV-SIM	SMJ0155-ICV4	10/12/2024 03:11	Pentachlorophenol	70.7	CCV	80-120
SV-SIM	SMJ0157-CCV1	10/13/2024 09:17	Dibenzo(a,h)anthracene	47.8	CCVe	50-150
SV-SIM	SMJ0157-ICV1	10/12/2024 16:12	Hexachlorobenzene	72	CCV	80-120

Analysis	Standard ID	Analysis Date/Time	Analyte	% Recovery	Std Type	Control Limit
SV-SIM	SMJ0157-ICV2	10/12/2024 16:51	Diethyl Phthalate	121.8	CCV	80-120
SV-SIM	SMJ0157-ICV2	10/12/2024 16:51	Hexachlorobenzene	76.4	CCV	80-120
SV-SIM	SMJ0157-ICV3	10/13/2024 00:28	Dibenzo(a,h)anthracene	59.1	CCV	80-120
SV-SIM	SMJ0157-ICV3	10/13/2024 00:28	Hexachlorobenzene	57.2	CCV	80-120
SV-SIM	SMJ0157-ICV4	10/13/2024 01:06	Dibenzo(a,h)anthracene	65.8	CCV	80-120
SV-SIM	SMJ0157-ICV4	10/13/2024 01:06	Diethyl Phthalate	122	CCV	80-120
SV-SIM	SMJ0157-ICV4	10/13/2024 01:06	Hexachlorobenzene	60.9	CCV	80-120
SV-SIM	SMJ0157-ICV4	10/13/2024 01:06	Pentachlorophenol	78.2	CCV	80-120
Dxn	SMK0032-CCV2	11/02/2024 06:15	OCDD	121.9	CCV	-

- Reporting limit standard % recoveries were outside of limits in the semivolatile and semivolatile SIM analyses. Associated detected sample results within two times the reporting limit and non-detect sample results qualified as estimated. Specific exceedances are shown below:

Analysis	Standard ID	Analysis Date/Time	Analyte	% Recovery	Std Type	Control Limit
SV	SMI0383-LCV1	09/25/2024 11:53	Benzo(g,h,i)perylene	44	LCV	50-150
SV	SMI0383-LCV1	09/25/2024 11:53	Dibenzo(a,h)anthracene	44.8	LCV	50-150
SV	SMI0383-LCV1	09/25/2024 11:53	Indeno(1,2,3-cd)pyrene	43.9	LCV	50-150
SV-SIM	SMJ0155-LCV1	10/11/2024 17:39	Benzoic Acid	45.7	LCV	50-150
SV-SIM	SMJ0155-LCV1	10/11/2024 17:39	Butyl benzyl phthalate	42.3	LCV	50-150
SV-SIM	SMJ0155-LCV2	10/12/2024 03:48	Butyl benzyl phthalate	262	LCV	50-150
SV-SIM	SMJ0157-LCV3	10/13/2024 02:22	Benzyl Alcohol	45.6	LCV	50-150

- Instrument drift was observed in the calibration blanks of the mercury analysis, with concentrations between the negative MDL and negative RL. Associated detected sample results within five times the blank level and non-detect sample results are qualified as estimated. Specific exceedances are shown below:

Analysis	Blank ID	Analysis Date/Time	Analyte	Concentration	MDL (mg/L)	RL (mg/L
Hg	SMJ0017-CCB3	10/01/2024 13:41	Mercury	-0.000022	0.000021	0.000100
Hg	SMJ0017-CCB5	10/01/2024 14:37	Mercury	-0.000023	0.000021	0.000100
Hg	SMJ0017-CCB6	10/01/2024 15:05	Mercury	-0.000025	0.000021	0.000100
Hg	SMJ0017-CCB7	10/01/2024 15:37	Mercury	-0.000025	0.000021	0.000100
Hg	SMJ0017-CCB8	10/01/2024 16:05	Mercury	-0.000025	0.000021	0.000100
Hg	SMJ0017-CCB9	10/01/2024 16:21	Mercury	-0.000023	0.000021	0.000100

- Blank contamination above 10% of the lowest associated sample concentration was reported in the semivolatile SIM analysis. Associated sample results below five times the blank concentration should be considered not detected. Sample results both below five times the blank concentration and below the reporting limit should be considered not detected and estimated at the reported value. Sample results between five and ten times the blank concentration are qualified as estimated. Specific contamination levels are shown below:

Analysis	Lab Blank ID	Analyte	Concentration	RL	Units
SV-SIM	BMI0474-BLK2	Diethyl phthalate	25.1	20	ug/kg
SV-SIM	BMI0474-BLK3	Diethyl phthalate	28.6	20	ug/kg
SV-SIM	BMI0474-BLK3	Pentachlorophenol	10.3 J	20	ug/kg
SV-SIM	BMI0474-BLK4	Diethyl phthalate	28.2	20	ug/kg
SV-SIM	BMI0474-BLK4	Pentachlorophenol	11.5 J	20	ug/kg

➢ One MS recovery was below the work plan control limit in the semivolatile SIM analysis. Both detected and non-results are qualified as estimated in the native sample. The specific exceedance is shown below:

Analysis	QC ID	Analyte	% Recovery	WP Control Limit
SV-SIM	20240912-G-CB-PCB-3MS2	Benzoic acid	14.9	30 - 160

➢ Laboratory duplicate RPDs exceeded control limits in the ICPMS metals analysis. Detected results are qualified as estimated in the associated samples, and non-detect results are considered unaffected. Specific exceedances are shown below:

Analysis	QC ID	Analyte	RPD	WP Control Limit
ICPMS	20240911-GS-TAT-M-1LD	Arsenic	22.1	20
ICPMS	20240911-GS-TAT-M-1LD	Lead	31.9	20

➢ Laboratory duplicate absolute differences exceeded 2 times the RL in the dioxin/furan analysis. Both detected and non-detect results in the native samples are qualified as estimated. The specific exceedance is shown below:

Analysis	QC ID	Analyte	Dup Result (ng/kg)	Sample Result (ng/kg)	RL (ng/kg)
Dxn	20240911-GS-TAT-D-1LD	Total HpCDF	1.81	4.15	1

➢ The laboratory analyzed 4 total organic carbon duplicates of the same sample and reported four separate RPDs. A replicate RSD of 30.2 was manually calculated as shown below. This value exceeded the control limit of <20% and associated results are qualified as estimated.

Analysis	Sample ID	Sample Result	Dup1 Result	Dup2 Result	Dup3 Result	Dup4 Result	RSD	Control Limit
TOC	20240911-GS-TAT-TOC-1D	11.6	6.86	15.6	8.89	11.7	30.2	<20

➢ Surrogate recoveries for p-terpheny-d14 were above laboratory control limits in the semivolatile and semivolatile SIM analyses. Associated detected results are qualified as estimated and non-detect results are considered unaffected. Specific recoveries are listed below:

Analysis	Sample ID	Surrogate	% Recovery	Lab Control Limit
SV	20240911-SBT-TAT-PCB-2	p-terphenyl-d14	173	37 - 120
SV	20240911-SBT-TAT-PCB-1	p-terphenyl-d14	171	37 - 120
SV	20240911-SBT-C-PCB-3	p-terphenyl-d14	166	37 - 120
SV	20240911-SBT-C-PCB-2	p-terphenyl-d14	155	37 - 120
SV	20240911-SBT-C-PCB-1	p-terphenyl-d14	163	37 - 120
SV	20240911-GS-C-PCB-3	p-terphenyl-d14	139	37 - 120
SV-SIM	20240912-G-CB-PCB-2	p-terphenyl-d14	140	37 - 120
SV-SIM	20240912-G-CB-PCB-1	p-terphenyl-d14	152	37 - 120
SV-SIM	20240912-MSG-CB-PCB-3	p-terphenyl-d14	139	37 - 120
SV-SIM	20240912-MSG-CB-PCB-2	p-terphenyl-d14	157	37 - 120
SV-SIM	20240912-MSG-CB-PCB-1	p-terphenyl-d14	165	37 - 120
SV-SIM	20240911-GS-C-PCB-2	p-terphenyl-d14	147	37 - 120
SV-SIM	20240911-GS-C-PCB-1	p-terphenyl-d14	143	37 - 120
SV-SIM	20240911-GS-TAT-PCB-2	p-terphenyl-d14	123	37 - 120
SV-SIM	20240911-GS-TAT-PCB-1	p-terphenyl-d14	122	37 - 120

➢ Internal standard recoveries were below control limits in the semivolatile and semivolatile SIM analyses. Both detect and non-detect results associated with low internals standard areas are qualified as estimated. The specific exceedances are shown below:

Analysis	Sample ID	Internal Standard	% Recovery	Control Limit
SV	20240911-SBT-C-PCB-1	Perylene-d12	10.5	50-200
SV	20240911-SBT-TAT-PCB-1	Di-n-Octyl phthalate-d4	49.9	50-200
SV	20240911-SBT-C-PCB-3	Di-n-Octyl phthalate-d4	30.4	50-200
SV	20240911-SBT-C-PCB-3	Chrysene-d12	38	50-200
SV	20240911-SBT-C-PCB-3	Perylene-d12	12.2	50-200
SV	20240911-SBT-C-PCB-2	Chrysene-d12	45.3	50-200
SV	20240911-SBT-C-PCB-2	Perylene-d12	15.7	50-200
SV	20240911-GS-TAT-PCB-1	Perylene-d12	18.5	50-200
SV	20240911-SBT-C-PCB-1	Chrysene-d12	42.6	50-200
SV	20240911-SBT-TAT-PCB-2	Perylene-d12	19.3	50-200
SV	20240911-SBT-C-PCB-1	Di-n-Octyl phthalate-d4	39	50-200
SV	20240911-GS-C-PCB-3	Perylene-d12	19.3	50-200
SV	20240911-GS-TAT-PCB-3	Perylene-d12	20.6	50-200
SV	20240911-GS-TAT-PCB-2	Perylene-d12	21.6	50-200
SV	20240911-GS-C-PCB-2	Perylene-d12	20.7	50-200
SV	20240911-GS-C-PCB-1	Perylene-d12	21.2	50-200
SV	20240911-SBT-C-PCB-2	Di-n-Octyl phthalate-d4	35.5	50-200
SV	20240911-SBT-TAT-PCB-1	Perylene-d12	18	50-200
SV-SIM	20240911-SBT-C-PCB-2	Chrysene-d12	33.3	50-200
SV-SIM	20240911-SBT-C-PCB-3	Perylene-d12	41.4	50-200
SV-SIM	20240911-SBT-C-PCB-2	Perylene-d12	44.9	50-200
SV-SIM	20240911-SBT-TAT-PCB-2	Perylene-d12	16	50-200
SV-SIM	20240911-SBT-TAT-PCB-2	Chrysene-d12	47.1	50-200
SV-SIM	20240911-SBT-TAT-PCB-1	Chrysene-d12	41.3	50-200
SV-SIM	20240911-SBT-TAT-PCB-1	Perylene-d12	14.5	50-200
SV-SIM	20240911-GS-TAT-PCB-3	Perylene-d12	46.3	50-200
SV-SIM	20240911-SBT-C-PCB-3	Chrysene-d12	28.6	50-200
SV-SIM	20240911-SBT-C-PCB-2	Perylene-d12	13.9	50-200
SV-SIM	20240911-SBT-C-PCB-1	Perylene-d12	16.9	50-200
SV-SIM	20240911-SBT-C-PCB-1	Chrysene-d12	46	50-200
SV-SIM	20240911-GS-C-PCB-3	Perylene-d12	32.4	50-200
SV-SIM	20240911-GS-C-PCB-2	Perylene-d12	38	50-200
SV-SIM	20240911-GS-C-PCB-1	Perylene-d12	36.3	50-200
SV-SIM	20240911-SBT-TAT-PCB-2	Perylene-d12	49	50-200
SV-SIM	20240911-SBT-C-PCB-3	Perylene-d12	12.4	50-200

➢ Chlorinated diphenyl ether interferences were present in the dioxin analysis and the amount of interference was evaluated. Results with an interference amount less than 25% of the total concentration are qualified as estimated. Results with an interference amount more than 25% of the total concentration are qualified “UJ” and should be considered not detected and estimated at the level reported.

Analysis	SDG	Sample ID	Analyte	Interference Amount
Dxn	24I0364	20240911-SBT-C-D-1	2,3,7,8-TCDF	<25%
Dxn	24I0364	20240911-SBT-C-D-3	2,3,7,8-TCDF	<25%
Dxn	24I0364	20240911-SBT-TAT-D-1	2,3,7,8-TCDF	>25%
Dxn	24I0364	20240911-SBT-TAT-D-2	2,3,7,8-TCDF	>25%

➢ Ion abundance ratios were outside of control limits in the dioxin analysis. The laboratory appropriately flagged these as estimated maximum possible concentrations (EMPCs). According to region 10 guidelines, EMPCs below the reporting limit should be considered not

detected, and are qualified “EMPC,U” and EMPCs above the reporting limit are qualified as estimated.

➢ Two sets of results were reported for eleven semivolatile samples and nine semivolatile SIM samples. The best result to report was selected according to the guidelines listed in the Data Validation Criteria Appendix. The results not selected as the best result to report are qualified R1, rejected due to the availability of a more accurate, precise or conservative result.

Please note: In the validation qualifier table shown in section 4.0, an ‘RE’ suffix was added to the client ID with the later analysis date to distinguish the two sets of results.

➢ Seventeen compounds were reported in both the semivolatile and semivolatile SIM analysis. The best result to report was again selected according to the guidelines listed in the Data Validation Criteria Appendix. The results not selected as the best result to report are qualified R2, replaced by a result from another method.

Issues not resulting in qualification:

➢ Dioxin/Furan toxicity equivalent quantity (TEQ): Region 10 guidelines indicates that three TEQs should be calculated, with the full value of detections in each case and the value of non-detects calculated at full, half and zero percent of their TEQ respectively. For the purposes of TEQ calculation, EMPCs below the RL are treated as non-detects, and EMPCs above the RL are treated as detections.

Recalculation of the TEQ was performed as follows:

Analysis	Sample ID	Lab Sample ID	TEQ-1	TEQ-1/2	TEQ-0
Dxn	20240911-GS-TAT-D-1	24I0364-01	1.850	1.050	0.256
Dxn	20240911-GS-TAT-D-2	24I0364-06	2.770	1.580	0.390
Dxn	20240911-GS-TAT-D-3	24I0364-11	1.850	1.140 J	0.424 J
Dxn	20240911-GS-C-D-1	24I0364-16	2.700	1.600	0.504 J
Dxn	20240911-GS-C-D-2	24I0364-21	1.900	1.310 J	0.727 J
Dxn	20240911-GS-C-D-3	24I0364-26	1.940	1.170	0.404
Dxn	20240911-SBT-C-D-1	24I0364-31	7.510 J	6.460 J	5.420 J
Dxn	20240911-SBT-C-D-2	24I0364-36	6.020 J	5.220 J	4.430 J
Dxn	20240911-SBT-C-D-3	24I0364-41	7.680 J	7.150 J	6.610 J
Dxn	20240911-SBT-TAT-D-1	24I0364-46	3.860 J	2.780 J	1.710 J
Dxn	20240911-SBT-TAT-D-2	24I0364-51	9.250 J	8.380 J	7.510 J
Dxn	20240911-SBT-TAT-D-3	24I0364-56	3.590	2.860 J	2.140 J

Where:
TEQ-1 = TEQ with 2005 WHO TEFs including full values of both EDLs and EMPCs.
TEQ-½ = TEQ with 2005 WHO TEFs including ½ values of both EDLs and EMPCs.
TEQ-0 = TEQ with 2005 WHO TEFs excluding EDLs and EMPCs.

➢ In the dioxin/furan analysis, the laboratory utilized the 3 times signal to noise ratio specified in CLP high resolution superfund methods rather than the 2.5 times signal to noise ratio specified in method 1613B for calculating estimated detection limits (EDLs). This is considered an acceptable method modification.

➢ Various calibration verification recoveries were outside of limits, but were not associated with reported samples or were limited to surrogate analytes. Additional calibration recoveries were outside of limits high, but associated with non-detect results. In each case, data quality was judged to have been unaffected and no qualifiers were assigned.

- Relative Response factors between 0.01 and 0.05 were present in several semivolatile standards. Qualifiers were assigned based on recoveries rather relative response factors in these cases.

- Various surrogate or spike recoveries and RPDs were outside of limits high, but associated with non-detect results. In each case, data quality was judged to have been unaffected and no qualifiers were assigned.

- Except for 2,4-dimethylphenol and hexachlorobutadiene, laboratory default reporting limits met work plan sediment cleanup objectives. Additional elevated reporting limits were present where samples were analyzed at a dilution or with a reduced sample amount. No qualifiers are assigned on the basis of elevated reporting limits.

- The dioxin total solids analysis did not include analysis of a duplicate. No qualifiers are assigned based on the absence of QC information.

4.0 Overall Assessment

Semivolatile Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Estimated qualifiers were assigned based on high or low calibration verification and/or RL standard recoveries. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes, with estimated qualifiers added based on high surrogate or low internal standard recoveries. Semivolatile data are acceptable for use as qualified.

Semivolatile SIM Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Estimated qualifiers were assigned based on high or low calibration verification recoveries. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes, with estimated qualifiers added based on low matrix spike and low internal standard recoveries. Additional qualifiers were assigned based on laboratory blank contamination. Semivolatile SIM data are acceptable for use as qualified.

Polychlorinated Biphenyl Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. PCB data are acceptable for use as reported.

Gasoline Range Hydrocarbon Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. Gas data are acceptable for use as reported.

Diesel Range Hydrocarbon Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Quality control results demonstrate acceptable levels of accuracy and precision. Diesel data are acceptable for use as reported.

Dioxin/Furan Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance for most analytes. Quality control results demonstrate acceptable levels of accuracy and precision for most analytes. Qualifiers were added for a high calibration verification recovery, lab blank contamination, and lab duplicate

variability. Additional qualifiers were added based on chlorinated diphenyl ether interferences and region 10 guidelines on treatment of EMPCs. Dioxin/furan data are acceptable for use as qualified.

ICPMS Metals Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Laboratory quality control results demonstrate acceptable levels of accuracy and precision for most analytes. Qualifiers were added to arsenic and lead results for high lab duplicate variability. ICPMS metals data are acceptable for use as qualified.

Mercury Analysis: Documentation was found to be clear and complete. Instrument banks showed instrument drift at levels allowed by the method, however seven low concentration results and all non-detect results were qualified as estimated. Remaining calibration results demonstrate acceptable instrument performance. Laboratory quality control results demonstrate acceptable levels of accuracy and precision. Mercury data are acceptable for use as qualified.

Total Organic Carbon Analysis: Documentation was found to be clear and complete. Calibration results demonstrate acceptable instrument performance. Some analysis dates did not meet QAPP target holding times and replicate analysis indicated variability. All sample results were qualified as estimated. TOC data are acceptable for use as qualified.

Total Solids Analysis: Documentation was found to be clear and complete. Quality control results demonstrate acceptable levels of precision. Total solids data are acceptable for use as reported.

Dioxin/Furan Total Solids Analysis: Documentation was found to be clear and complete. Recalculated results match reported results. Dioxin/Furan total solids data are acceptable for use as reported.

5.0 Validation Qualifiers

Client ID	Analyte(s)	Qualifier	Reason
Semivolatile Analysis			
20240911-GS-C-PCB-1	4-Methylphenol, Phenol	R2	Detected result available from another method
20240911-GS-C-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-C-PCB-1	Fluoranthene	UJ	Low CCV recovery
20240911-GS-C-PCB-1	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-C-PCB-1	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-C-PCB-1	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-C-PCB-1 RE	All	R1	Lower detection limit result available
20240911-GS-C-PCB-2	4-Methylphenol, Phenol	R2	Detected result available from another method

Client ID	Analyte(s)	Qualifier	Reason
20240911-GS-C-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-C-PCB-2	Fluoranthene	UJ	Low CCV recovery
20240911-GS-C-PCB-2	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-C-PCB-2	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-C-PCB-2	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-C-PCB-2 RE	All	R1	Lower detection limit result available
20240911-GS-C-PCB-3	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery
20240911-GS-C-PCB-3	Pyrene	J	High surrogate recovery
20240911-GS-C-PCB-3	Fluoranthene	J	Low CCV recovery, High surrogate recovery
20240911-GS-C-PCB-3	4-Methylphenol, Phenol	R2	Detected result available from another method
20240911-GS-C-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-3	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-C-PCB-3	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-C-PCB-3	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-C-PCB-3	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-C-PCB-3 RE	Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Detected result available
20240911-GS-C-PCB-3 RE	All except Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Lower detection limit result available
20240911-GS-TAT-PCB-1	4-Methylphenol, Phenol	R2	Detected result available from another method
20240911-GS-TAT-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-TAT-PCB-1	Fluoranthene	UJ	Low CCV recovery
20240911-GS-TAT-PCB-1	Benzoic acid	UJ	Low ICV recovery
20240911-GS-TAT-PCB-1	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-TAT-PCB-1	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-TAT-PCB-1	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-TAT-PCB-1 RE	All	R1	Lower detection limit result available

Client ID	Analyte(s)	Qualifier	Reason
20240911-GS-TAT-PCB-2	Phenol	R2	Detected result available from another method
20240911-GS-TAT-PCB-2	4-Methylphenol	R2	Higher concentration result available from another method
20240911-GS-TAT-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-TAT-PCB-2	Fluoranthene	UJ	Low CCV recovery
20240911-GS-TAT-PCB-2	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-TAT-PCB-2	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-TAT-PCB-2	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-TAT-PCB-2 RE	4-Methylphenol	R1	Detected result available
20240911-GS-TAT-PCB-2 RE	All except 4-Methylphenol	R1	Lower detection limit result available
20240911-GS-TAT-PCB-3	Phenol	R2	Detected result available from another method
20240911-GS-TAT-PCB-3	4-Methylphenol	R2	Higher concentration result available from another method
20240911-GS-TAT-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-3	Acenaphthylene	UJ	High ICAL RSD
20240911-GS-TAT-PCB-3	Fluoranthene	UJ	Low CCV recovery
20240911-GS-TAT-PCB-3	Benzo(a)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-GS-TAT-PCB-3	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-GS-TAT-PCB-3	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-GS-TAT-PCB-3 RE	4-Methylphenol	R1	Detected result available
20240911-GS-TAT-PCB-3 RE	All except 4-Methylphenol	R1	Lower detection limit result available
20240911-SBT-C-PCB-1	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-1	Pyrene	J	High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-1	Fluoranthene	J	Low CCV recovery, High surrogate recovery
20240911-SBT-C-PCB-1	Butyl benzyl phthalate	R2	Detected result available from another method
20240911-SBT-C-PCB-1	4-Methylphenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-C-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240911-SBT-C-PCB-1	Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Di-n-octyl phthalate, Total benzofluoranthenes	UJ	Low IS recovery
20240911-SBT-C-PCB-1	Benzo(g,h,i)perylene	UJ	Low LCV recovery, Low CCV recovery, Low CCVe recovery, Low IS recovery
20240911-SBT-C-PCB-1	Indeno(1,2,3-cd)pyrene	UJ	Low LCV recovery, Low CCV recovery, Low IS recovery
20240911-SBT-C-PCB-1 RE	4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Phenol, Pyrene	R1	Detected result available
20240911-SBT-C-PCB-1 RE	All except 4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Phenol, Pyrene	R1	Lower detection limit result available
20240911-SBT-C-PCB-2	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-2	Fluoranthene, Phenanthrene	J	High surrogate recovery
20240911-SBT-C-PCB-2	Pyrene	J	High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-2	2-Methylphenol	R2	Detected result available from another method
20240911-SBT-C-PCB-2	4-Methylphenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-SBT-C-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240911-SBT-C-PCB-2	Benzo(g,h,i)perylene	UJ	Low CCVe recovery, Low IS recovery
20240911-SBT-C-PCB-2	Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Di-n-octyl phthalate, Indeno(1,2,3-cd)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-SBT-C-PCB-2 RE	4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Phenanthrene, Phenol, Pyrene	R1	Detected result available
20240911-SBT-C-PCB-2 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylnaphthalene, 2-Methylphenol, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Chrysene, Dibenzo(a,h)anthracene, Dibenzofuran, Diethyl phthalate, Dimethyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Indeno(1,2,3-cd)pyrene, Naphthalene, n-Nitrosodiphenylamine, Pentachlorophenol, Total benzofluoranthenes	R1	Lower detection limit result available
20240911-SBT-C-PCB-3	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-3	Fluoranthene, Phenanthrene	J	High surrogate recovery
20240911-SBT-C-PCB-3	Pyrene	J	High surrogate recovery, Low IS recovery
20240911-SBT-C-PCB-3	Butyl benzyl phthalate	R2	Detected result available from another method
20240911-SBT-C-PCB-3	4-Methylphenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-SBT-C-PCB-3	Acenaphthylene	UJ	High ICAL RSD

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-C-PCB-3	Benzo(g,h,i)perylene	UJ	Low CCVe recovery, Low IS recovery
20240911-SBT-C-PCB-3	Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Di-n-octyl phthalate, Indeno(1,2,3-cd)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-SBT-C-PCB-3 RE	4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Phenanthrene, Phenol, Pyrene	R1	Detected result available
20240911-SBT-C-PCB-3 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylnaphthalene, 2-Methylphenol, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(g,h,i)perylene, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Chrysene, Dibenzo(a,h)anthracene, Dibenzofuran, Diethyl phthalate, Dimethyl phthalate, Di-n-butyl phthalate, Di-n-octyl phthalate, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Indeno(1,2,3-cd)pyrene, Naphthalene, n-Nitrosodiphenylamine, Pentachlorophenol, Total benzofluoranthenes	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-1	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery, Low IS recovery
20240911-SBT-TAT-PCB-1	Fluoranthene, Pyrene	J	High surrogate recovery
20240911-SBT-TAT-PCB-1	Phenol	R2	Detected result available from another method
20240911-SBT-TAT-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-SBT-TAT-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240911-SBT-TAT-PCB-1	Benzo(g,h,i)perylene	UJ	Low CCVe recovery, Low IS recovery
20240911-SBT-TAT-PCB-1	Benzo(a)pyrene, Di-n-octyl phthalate, Indeno(1,2,3-cd)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-SBT-TAT-PCB-1 RE	4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Detected result available
20240911-SBT-TAT-PCB-1 RE	All except 4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-2	Bis(2-ethylhexyl) phthalate	J	High CCVe recovery, High surrogate recovery
20240911-SBT-TAT-PCB-2	Fluoranthene, Pyrene	J	High surrogate recovery
20240911-SBT-TAT-PCB-2	Phenol	R2	Detected result available from another method
20240911-SBT-TAT-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-SBT-TAT-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240911-SBT-TAT-PCB-2	Benzo(g,h,i)perylene	UJ	Low CCVe recovery, Low IS recovery
20240911-SBT-TAT-PCB-2	Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Total benzofluoranthenes	UJ	Low IS recovery
20240911-SBT-TAT-PCB-2 RE	4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Detected result available
20240911-SBT-TAT-PCB-2 RE	All except 4-Methylphenol, Bis(2-ethylhexyl) phthalate, Fluoranthene, Pyrene	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-3	Fluoranthene, Pyrene	J	Low CCV recovery
20240911-SBT-TAT-PCB-3	Phenol	R2	Detected result available from another method
20240911-SBT-TAT-PCB-3	4-Methylphenol	R2	Higher concentration result available from another method

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-TAT-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R2	Lower detection limit result available from another method
20240911-SBT-TAT-PCB-3	Acenaphthylene	UJ	High ICAL RSD
20240912-G-CB-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240912-G-CB-PCB-1	Fluoranthene, Pyrene	UJ	Low CCV recovery
20240912-G-CB-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240912-G-CB-PCB-2	Fluoranthene, Pyrene	UJ	Low CCV recovery
20240912-G-CB-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-3	Acenaphthylene	UJ	High ICAL RSD
20240912-G-CB-PCB-3	Fluoranthene, Pyrene	UJ	Low CCV recovery
20240912-MSG-CB-PCB-1	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-MSG-CB-PCB-1	Acenaphthylene	UJ	High ICAL RSD
20240912-MSG-CB-PCB-1	Fluoranthene, Pyrene	UJ	Low CCV recovery
20240912-MSG-CB-PCB-2	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-MSG-CB-PCB-2	Acenaphthylene	UJ	High ICAL RSD
20240912-MSG-CB-PCB-2	Fluoranthene, Pyrene	UJ	Low CCV recovery
20240912-MSG-CB-PCB-3	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, 4-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol, Phenol	R2	Lower detection limit result available from another method
20240912-MSG-CB-PCB-3	Acenaphthylene	UJ	High ICAL RSD
20240912-MSG-CB-PCB-3	Fluoranthene, Pyrene	UJ	Low CCV recovery

Client ID	Analyte(s)	Qualifier	Reason
Semivolatile SIM Analysis			
20240911-GS-C-PCB-1	Butyl benzyl phthalate	R1	Lower detection limit result available
20240911-GS-C-PCB-1	Benzyl alcohol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-1	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240911-GS-C-PCB-1	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-GS-C-PCB-1	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-GS-C-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-C-PCB-1	Benzoic acid	UJ	Low LCV recovery
20240911-GS-C-PCB-1 RE	4-Methylphenol, Phenol	R1	Detected result available
20240911-GS-C-PCB-1 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-GS-C-PCB-1 RE	Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-2	Butyl benzyl phthalate	R1	Lower detection limit result available
20240911-GS-C-PCB-2	Benzyl alcohol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-2	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240911-GS-C-PCB-2	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-GS-C-PCB-2	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-GS-C-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-C-PCB-2	Benzoic acid	UJ	Low LCV recovery
20240911-GS-C-PCB-2 RE	4-Methylphenol, Phenol	R1	Detected result available
20240911-GS-C-PCB-2 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-GS-C-PCB-2 RE	Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-3	Butyl benzyl phthalate	R1	Lower detection limit result available
20240911-GS-C-PCB-3	Benzyl alcohol	R2	Lower detection limit result available from another method
20240911-GS-C-PCB-3	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-GS-C-PCB-3	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-GS-C-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-C-PCB-3	Benzoic acid	UJ	Low LCV recovery
20240911-GS-C-PCB-3 RE	4-Methylphenol, Phenol	R1	Detected result available

Client ID	Analyte(s)	Qualifier	Reason
20240911-GS-C-PCB-3 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-GS-C-PCB-3 RE	Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-1	Benzoic acid, Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-1	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240911-GS-TAT-PCB-1	Dibenzo(a,h)anthracene, n-Nitrosodiphenylamine	UJ	Low CCV recovery
20240911-GS-TAT-PCB-1	Pentachlorophenol	UJ	Low CCV recovery, Lab blank contamination
20240911-GS-TAT-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-TAT-PCB-2	Benzyl alcohol, Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-GS-TAT-PCB-2	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240911-GS-TAT-PCB-2	Dibenzo(a,h)anthracene, n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-GS-TAT-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-TAT-PCB-2	Benzoic acid	UJ	Low LCV recovery
20240911-GS-TAT-PCB-3	Butyl benzyl phthalate	R1	Lower detection limit result available
20240911-GS-TAT-PCB-3	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-GS-TAT-PCB-3	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-GS-TAT-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-GS-TAT-PCB-3	Benzoic acid	UJ	Low LCV recovery
20240911-GS-TAT-PCB-3 RE	Phenol	R1	Detected result available
20240911-GS-TAT-PCB-3 RE	4-Methylphenol	R1	Higher concentration result available
20240911-GS-TAT-PCB-3 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-GS-TAT-PCB-3 RE	Butyl benzyl phthalate	R2	Lower detection limit result available from another method
20240911-SBT-C-PCB-1	Butyl benzyl phthalate	J	High CCV recovery
20240911-SBT-C-PCB-1	Phenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-1	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-SBT-C-PCB-1	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-SBT-C-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-SBT-C-PCB-1	Benzoic acid	UJ	Low LCV recovery
20240911-SBT-C-PCB-1 RE	Butyl benzyl phthalate	R1	Detected result available

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-C-PCB-1 RE	4-Methylphenol, Phenol	R1	Higher concentration result available
20240911-SBT-C-PCB-1 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-SBT-C-PCB-2	Phenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-2	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-SBT-C-PCB-2	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-SBT-C-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-SBT-C-PCB-2	Benzoic acid	UJ	Low LCV recovery
20240911-SBT-C-PCB-2	Butyl benzyl phthalate	UJ	Low LCV recovery, Low IS response
20240911-SBT-C-PCB-2 RE	2-Methylphenol, Phenol	R1	Detected result available
20240911-SBT-C-PCB-2 RE	4-Methylphenol	R1	Higher concentration result available
20240911-SBT-C-PCB-2 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-SBT-C-PCB-3	Butyl benzyl phthalate	J	High CCV recovery
20240911-SBT-C-PCB-3	Phenol	R2	Higher concentration result available from another method
20240911-SBT-C-PCB-3	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-SBT-C-PCB-3	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-SBT-C-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-SBT-C-PCB-3	Benzoic acid	UJ	Low LCV recovery
20240911-SBT-C-PCB-3 RE	Butyl benzyl phthalate	R1	Detected result available
20240911-SBT-C-PCB-3 RE	4-Methylphenol, Phenol	R1	Higher concentration result available
20240911-SBT-C-PCB-3 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-1	4-Methylphenol	R2	Higher concentration result available from another method
20240911-SBT-TAT-PCB-1	n-Nitrosodiphenylamine, Pentachlorophenol	UJ	Low CCV recovery
20240911-SBT-TAT-PCB-1	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-SBT-TAT-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-SBT-TAT-PCB-1	Benzoic acid	UJ	Low LCV recovery
20240911-SBT-TAT-PCB-1	Butyl benzyl phthalate	UJ	Low LCV recovery, Low IS response
20240911-SBT-TAT-PCB-1 RE	4-Methylphenol, Phenol	R1	Detected result available

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-TAT-PCB-1 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-2	4-Methylphenol	R1	Higher concentration result available
20240911-SBT-TAT-PCB-2	Benzyl alcohol	R2	Lower detection limit result available from another method
20240911-SBT-TAT-PCB-2	n-Nitrosodiphenylamine	UJ	Low CCV recovery
20240911-SBT-TAT-PCB-2	Pentachlorophenol	UJ	Low CCV recovery, Lab blank contamination
20240911-SBT-TAT-PCB-2	Dibenzo(a,h)anthracene	UJ	Low CCV recovery, Low IS response
20240911-SBT-TAT-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240911-SBT-TAT-PCB-2	Butyl benzyl phthalate	UJ	Low IS response
20240911-SBT-TAT-PCB-2 RE	Phenol	R1	Detected result available
20240911-SBT-TAT-PCB-2 RE	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 2,4-Dimethylphenol, 2-Methylphenol, Benzoic acid, Benzyl alcohol, Butyl benzyl phthalate, Dibenzo(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Hexachlorobenzene, Hexachlorobutadiene, n-Nitrosodiphenylamine, Pentachlorophenol	R1	Lower detection limit result available
20240911-SBT-TAT-PCB-2 RE	4-Methylphenol	R2	Higher concentration result available from another method
20240911-SBT-TAT-PCB-3	Benzyl alcohol	R2	Lower detection limit result available from another method
20240911-SBT-TAT-PCB-3	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240911-SBT-TAT-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-G-CB-PCB-1	Benzyl alcohol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-1	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240912-G-CB-PCB-1	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240912-G-CB-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-G-CB-PCB-2	Benzyl alcohol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-2	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240912-G-CB-PCB-2	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240912-G-CB-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-G-CB-PCB-3	Benzyl alcohol	R2	Lower detection limit result available from another method
20240912-G-CB-PCB-3	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240912-G-CB-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-G-CB-PCB-3	Benzoic acid	UJ	Low MS recovery
20240912-MSG-CB-PCB-1	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240912-MSG-CB-PCB-1	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery

Client ID	Analyte(s)	Qualifier	Reason
20240912-MSG-CB-PCB-1	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-MSG-CB-PCB-1	Benzyl alcohol	UJ	Low LCV recovery
20240912-MSG-CB-PCB-2	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240912-MSG-CB-PCB-2	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240912-MSG-CB-PCB-2	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-MSG-CB-PCB-2	Benzyl alcohol	UJ	Low LCV recovery
20240912-MSG-CB-PCB-3	Diethyl phthalate	UJ	High CCV recovery, Lab blank contamination, High surrogate recovery
20240912-MSG-CB-PCB-3	Dibenzo(a,h)anthracene, Hexachlorobenzene, Pentachlorophenol	UJ	Low CCV recovery
20240912-MSG-CB-PCB-3	2,4-Dimethylphenol	UJ	Low ICV recovery
20240912-MSG-CB-PCB-3	Benzyl alcohol	UJ	Low LCV recovery
Dioxin/Furan Analysis			
20240911-GS-C-D-1	OCDF	J	Region 10 guidelines for EMPC >RL
20240911-GS-C-D-2	1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDD	J	Region 10 guidelines for EMPC >RL
20240911-GS-C-D-3	1,2,3,4,6,7,8-HpCDF	J	Region 10 guidelines for EMPC >RL
20240911-GS-TAT-D-1	Total HpCDF	J	High lab duplicate difference
20240911-GS-TAT-D-1	1,2,3,4,6,7,8-HpCDF	J	Region 10 guidelines for EMPC >RL
20240911-GS-TAT-D-2	1,2,3,6,7,8-HxCDD	EMPC,U	Region 10 guidelines for EMPC <RL
20240911-GS-TAT-D-3	1,2,3,4,6,7,8-HpCDF, OCDF	J	Region 10 guidelines for EMPC >RL
20240911-SBT-C-D-1	1,2,3,6,7,8-HxCDF	EMPC,U	Region 10 guidelines for EMPC <RL
20240911-SBT-C-D-1	OCDD	J	High CCV recovery
20240911-SBT-C-D-1	2,3,7,8-TCDF	J	Minimal interferences present (RL
20240911-SBT-C-D-1	1,2,3,4,7,8-HxCDF, 1,2,3,7,8,9-HxCDD	J	Region 10 guidelines for EMPC >RL
20240911-SBT-C-D-2	1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,7,8-PeCDF	EMPC,U	Region 10 guidelines for EMPC <RL
20240911-SBT-C-D-2	OCDD	J	High CCV recovery
20240911-SBT-C-D-2	1,2,3,7,8,9-HxCDD	J	Region 10 guidelines for EMPC >RL
20240911-SBT-C-D-3	1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF	EMPC,U	Region 10 guidelines for EMPC <RL
20240911-SBT-C-D-3	OCDD	J	High CCV recovery
20240911-SBT-C-D-3	2,3,7,8-TCDF	J	Minimal interferences present (<25%)
20240911-SBT-C-D-3	1,2,3,4,7,8,9-HpCDF, 1,2,3,7,8,9-HxCDD	J	Region 10 guidelines for EMPC >RL
20240911-SBT-TAT-D-1	OCDD	J	High CCV recovery
20240911-SBT-TAT-D-1	1,2,3,4,6,7,8-HpCDF	J	Region 10 guidelines for EMPC >RL
20240911-SBT-TAT-D-1	2,3,7,8-TCDF	UJ	Interferences present (>25%)
20240911-SBT-TAT-D-2	OCDD	J	High CCV recovery

Client ID	Analyte(s)	Qualifier	Reason
20240911-SBT-TAT-D-2	1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8-HxCDF	J	Region 10 guidelines for EMPC >RL
20240911-SBT-TAT-D-2	2,3,7,8-TCDF	UJ	Interferences present (>25%)
20240911-SBT-TAT-D-3	OCDD	J	High CCV recovery
20240911-SBT-TAT-D-3	2,3,4,6,7,8-HxCDF	J	Region 10 guidelines for EMPC >RL
ICPMS Metals Analysis			
20240911-GS-C-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240911-GS-C-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240911-GS-C-M-3	Arsenic, Lead	J	High lab duplicate RPD
20240911-GS-TAT-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240911-GS-TAT-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240911-GS-TAT-M-3	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-C-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-C-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-C-M-3	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-TAT-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-TAT-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240911-SBT-TAT-M-3	Arsenic, Lead	J	High lab duplicate RPD
20240912-G-CB-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240912-G-CB-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240912-G-CB-M-3	Arsenic, Lead	J	High lab duplicate RPD
20240912-MSG-CB-M-1	Arsenic, Lead	J	High lab duplicate RPD
20240912-MSG-CB-M-2	Arsenic, Lead	J	High lab duplicate RPD
20240912-MSG-CB-M-3	Arsenic, Lead	J	High lab duplicate RPD
Mercury Analysis			
20240911-GS-C-M-1	Mercury	UJ	CCB Drift below (-MDL)
20240911-GS-C-M-2	Mercury	UJ	CCB Drift below (-MDL)
20240911-GS-C-M-3	Mercury	UJ	CCB Drift below (-MDL)
20240911-GS-TAT-M-2	Mercury	J	CCB Drift below (-MDL)
20240911-GS-TAT-M-3	Mercury	J	CCB Drift below (-MDL)
20240911-SBT-C-M-1	Mercury	UJ	CCB Drift below (-MDL)
20240911-SBT-C-M-2	Mercury	J	CCB Drift below (-MDL)
20240911-SBT-C-M-3	Mercury	UJ	CCB Drift below (-MDL)
20240911-SBT-TAT-M-1	Mercury	J	CCB Drift below (-MDL)
20240911-SBT-TAT-M-3	Mercury	J	CCB Drift below (-MDL)

Client ID	Analyte(s)	Qualifier	Reason
20240912-MSG-CB-M-1	Mercury	UJ	CCB Drift below (-MDL)
20240912-MSG-CB-M-2	Mercury	J	CCB Drift below (-MDL)
20240912-MSG-CB-M-3	Mercury	J	CCB Drift below (-MDL)
Total Organic Carbon Analysis			
20240911-GS-C-TOC-1	Total Organic Carbon	J	High replicate RSD
20240911-GS-C-TOC-2	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-GS-C-TOC-3	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-GS-TAT-TOC-1	Total Organic Carbon	J	High replicate RSD
20240911-GS-TAT-TOC-2	Total Organic Carbon	J	High replicate RSD
20240911-GS-TAT-TOC-3	Total Organic Carbon	J	High replicate RSD
20240911-SBT-C-TOC-1	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-SBT-C-TOC-2	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-SBT-C-TOC-3	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-SBT-TAT-TOC-1	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-SBT-TAT-TOC-2	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240911-SBT-TAT-TOC-3	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240912-G-CB-TOC-1	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240912-G-CB-TOC-2	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240912-G-CB-TOC-3	Total Organic Carbon	J	High replicate RSD, Analysis hold time exceeded
20240912-MSG-CB-TOC-1	Total Organic Carbon	J	High replicate RSD
20240912-MSG-CB-TOC-2	Total Organic Carbon	J	High replicate RSD
20240912-MSG-CB-TOC-3	Total Organic Carbon	J	High replicate RSD

6.0 Common Abbreviations and Definitions

DV Qualifier	Definition
U	The material was analyzed for, but was not detected above the level of the associated value.
UY	The reporting limit was elevated due to chromatographic overlap with related compounds. The material was analyzed for, but was not detected above the level of the associated value.
J	The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.
UJ	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The sample result is rejected. The presence or absence of the analyte cannot be verified and data are not usable.

DV Qualifier	Definition
R1	This sample result has been rejected in favor of a more accurate, precise or conservative result.
R2	This sample result has been rejected in favor of a more accurate, precise or conservative result from another analytical method.

QC Element	Definition
ICAL	Initial calibration
ICV	Initial calibration verification
CCV	Continuing calibration verification
LCS	Laboratory control sample
LCSD	Laboratory control sample
MS	Matrix spike
MSD	Matrix spike duplicate
SRM	Standard reference material
RRM	Regional reference material
FD	Field duplicate
FB	Field blank
RB	Rinse blank
TB	Trip blank
IS	Internal standard
RT	Retention time
RRT	Relative retention time
RPD	Relative percent difference

Abbreviation	Definition
CRDL	Contract required detection limit
DV	Data validation
EDL	Estimated detection limit
EMPC	Estimated maximum possible concentration
KED	Kinetic energy discrimination in collision/reaction cell
MDL	Method detection limit
NA	Not applicable
QAPP	Quality Assurance Project Plan
RL	Reporting limit
RSD	Relative standard deviations
SAP	Sampling and Analysis Plan
SDG	Sample delivery group
SIM	Selective ion monitoring
SRM	Selective reaction monitoring
UCT	Universal cell technology

7.0 References

National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency. November 2020, EPA-540-R-20-005.

National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, November 2020, EPA-542-R-20-006.

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USEPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, January 2009, EPA 540-R-08-005.

Method 3660B: *Sulfur Cleanup.* SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 December 1996.

Method 3665A: *Sulfuric Acid/Permanganate Cleanup.* SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 1 December 1996.

Method 6020B: Inductively Coupled Plasma – Mass Spectrometry, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 July 2014.

Method 7471B: Mercury in Solid Or Semisolid Waste (Manual Cold-Vapor Technique), SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 2 February 2007.

Method 8000D: Determinative Chromatographic Separations, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 5 March 2018.

Method 8082A: Polychlorinated Biphenyls (PCBs) by Gas Chromatography, SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 1 November 2000.

Method 8270E: Semivolatile Organic compounds by Gas Chromatography/Mass Spectrometry (GC/MS), SW-846, US Environmental Protection Agency, Office of Solid Waste, Revision 6 June 2018.

Method NWTPH-Gx: Volatile Petroleum Products Method for Soil and Water, Analytical Methods for Petroleum Hydrocarbons, WA State Department of Ecology ECY 97-0-02, June 1997.

Method NWTPH-Dx: Semi-Volatile Petroleum Products Method for Soil and Water, Analytical Methods for Petroleum Hydrocarbons, WA State Department of Ecology ECY 97-0-02, June 1997.

Import Material Characterization Work Plan, Whitmarsh Landfill Remediation, Anacortes, Washington. Prepared by: WSP USA Environment and Infrastructure Inc. Prepared for: Skagit County. September 13, 2024.

APPENDIX – DATA VALIDATION CRITERIA

Data Package Completeness and Sample Integrity

QC Element	Criteria
Completeness	Laboratory report includes the appropriate level of detail as described in the EPA Guidance documents (USEPA, January 2009)
Sample ID transcription	Chain of custodies and/or sample log-in documentation are present for all samples reported and match sample IDs used in the laboratory report and electronic data deliverable (EDD).
Sample receipt condition	Sample containers are intact upon receipt at the laboratory and preservation and storage requirements meet method specific guidelines.
Requested analysis and method	Analyses completed for each analysis requested on the chain of custody. Appropriate methods or acceptable substitutions used. Table 1 of the work plan specifies the following EPA methods 6010, 7471A, 8270D, 8082,8081/PSEP, and 1613B and 9060.
Requested analytes and reporting limits	Reporting limits meet target levels for requested analytes. Table 1 of the work plan lists the required analytes for each method and their sediment cleanup objective.
Laboratory Narrative	The laboratory narrative, data flags and corrective action documentation detailing any preparation or analytical anomalies are evaluated for impact on data usability.

Notes:

- Newer versions of published analytical methods are considered acceptable substitutions.
- Method substitutions utilizing different instrumentation are also considered acceptable, e.g. method 200.8 (ICP-MS) for method 200.7 (ICP-AES) if desired reporting limits are met.
- Data referencing older versions of published analytical methods may be assessed based on numerical criteria present in newer versions.
- RPD criteria in the tables below do not apply to low concentration results. Where either concentration is below 5 times the RL, The absolute difference must be less than 2 times the RL for soil/solid samples and less than the RL for water samples. This applies to all methods, however does not typically apply to spike duplicates due to the spike concentration relative to RL.

Selection of Reportable Results

Where multiple results are available for the same sample and analyte, the following guidelines are used to select the best result to report:

1) Data rejected as unusable based on other validation criteria are excluded from consideration.
2) If all results are non-detects, the lowest reporting limit is selected.
3) If both non-detect and detected results are available, the detection is selected.
4) If both results are detections, the following additional criteria are applied:
    a) If one result meets all identification criteria, and the other doesn't, the result meeting all criteria is selected.
    b) If one result is off-scale and one is on-scale, the on-scale result is selected.
    c) If associated QC results indicated high bias, the lower concentration result is selected.
    d) If associated QC results indicated no, low, or mixed biases, the higher concentration result is selected.

This approach is conservative, and is considered most protective of the environment. The results not selected as the best result to report are qualified R1 if from the same analytical method, and R2 if from a different analytical method.

Semivolatile Organic Compounds–SW846 Method 8270E

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Soil and solid samples must be extracted within 14 days if refrigerated and 1 year if frozen. Extracts must be analyzed within 40 days of extraction.	2A
Instrument performance	Prior to initial calibration	Ion abundance ratios in decafluorotriphenylphosphate (DFTPP) or instrument manufacturer criteria.	2B
Initial calibration (ICAL) Initial Calibration	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥5 points for average response factor (RF) model and ≥6 points for regression models. • RF Relative standard deviation (RSD) ≤20% if average RF model. Coefficient of Determination (R2) ≥0.99 if regression model. • Individual recoveries within 50-150% for the low standard and individual recoveries within 70-130% for the remaining standards.	2B
Initial calibration verification (ICV)	After each ICAL prior to samples	Recoveries within 70-130%.	2B
Continuing calibration (CCV)	Once every 12 hours, before sample analysis	Recoveries within 80-120%	2B
Ending calibration verification (CCVe)	Not required. If performed, after sample analysis.	Recoveries within 50-150%	2B
Reporting limit calibration verification (RL Std)	Not required.	Recoveries within 50-150%	2B

Semivolatile Organic Compounds–SW846 Method 8270E

QC Element	Frequency	Criteria	Stage
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.	2A
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Recoveries within 30-160%.	2A
Matrix spike (MS)	One per batch of ≤20 samples.	Recoveries within 30-160%.	2A
Duplicates	MS dup (MSD) per batch of ≤20 samples.	RPD < 40%.	2A
Surrogates	Each sample and QC sample	Recovery meeting performance-based control limits.	2A
Internal standards (IS)	If used, must be in each sample and QC sample	• IS response within 50-200% of CCV • IS RT with ± 10 seconds of CCV	2B

Notes: The above criteria applies to both 8270 and 8270-SIM methods.

Polychlorinated Biphenyl Aroclors–SW846 Method 8082A

QC Element	Frequency	Criteria	Stage
Holding times*	Each sample	Soil and solid samples must be extracted within 14 days if refrigerated and 1 year if frozen. Extracts must be analyzed within 40 days of extraction.	2A
Initial calibration (ICAL)	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥5 points for average response factor for 1016 and 1260, and single point calibration standards for the remaining Aroclors • Relative standard deviation (RSD) ≤20% if average response • Coefficient of determination (R2) ≥0.99 if regression.	2B
Initial calibration verification (ICV)	Not required. After ICAL, if analyzed	Recoveries within 70-130%.	2B
Continuing calibration (CCV)	Once every 20 samples	Recoveries within 75-125%.	2B
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.	2A
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Recoveries within 37-116%.	2A
Matrix spike (MS)	One per batch of ≤20 samples.	Recoveries 37-116%.	2A
Duplicates	MS dup (MSD) per batch of ≤20 samples.	RPD < 50%.	2A
Surrogates	Each sample and QC sample	Recovery within 34-141 and meeting performance-based control limits.	2A
Internal standards (IS)	If used, must be in each sample and QC sample	• IS response within 50-200% of CCV • IS RT with ± 30 seconds of CCV	2B

Note: Functional guidelines does not require qualification for holding times if soil and sediment samples are extracted within 1 year and analyzed within 40 days of extraction.

Gasoline Range Petroleum Hydrocarbons–Method NWTPH-G

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Soil and solid samples must analyzed within 14 days. Transportation and storage temperatures should be below 6°C.	2A
Initial calibration (ICAL)	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥5 points for average response factor (RF) model and ≥6 points for regression models. • RF Relative standard deviation (RSD) ≤20% if average RF model. • Coefficient of Determination (R^2) ≥0.99 if regression model.	2B
Initial calibration verification (ICV)	After each ICAL prior to samples	Recoveries within 70-130%.	2B
Continuing calibration (CCV)	Daily	Recoveries within 85-115%.	2B
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.	2A
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Meets performance-based control limits for % recovery and relative % difference (RPD) if applicable.	2A
Duplicates	Sample dup once per 10 samples.	Meets performance-based control limits for RPD. LCS duplicate if insufficient sample volume provided.	2A

Gasoline Range Petroleum Hydrocarbons–Method NWTPH-G

QC Element	Frequency	Criteria	Stage
Surrogates	Each sample and QC sample	Recoveries within 50-150% and meeting performance based limits.	2A

Diesel Range Petroleum Hydrocarbons–Method NWTPH-Dx

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Soil and solid samples must be extracted within 14 days and analyzed within 40 days of extraction. Transportation and storage temperatures should be below 6°C.	2A
Initial calibration (ICAL)	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥5 points • Coefficient of determination (R2) ≥0.99 • Individual standard recoveries ±15% of true value	2B
Continuing calibration (CCV)	Before and after sample analysis each day.	Recoveries within ±15% of true value	2B
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentration in field samples.	2A
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Recoveries within 50-150% or meeting performance based limits.	2A
Matrix Spike (MS)	One per batch of ≤20 samples.	Meets performance-based control limits for % recovery. Not required if insufficient sample volume provided.	2A
Duplicates	Matrix duplicate per batch of ≤10 samples.	RPDs<35%.	2A
Surrogates	Each sample and QC sample	Recoveries within 50-150% or meeting performance based limits.	2A

Notes: RSD of <20 is accepted in lieu of R2/individual recoveries to demonstrate calibration linearity.

Dioxin and Furans–Method 1613

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must be extracted within 1 year and analyzed within 40 days of extraction. Transportation and storage temperatures should be below 6°C. Extract storage time may be extended to 1 year if extracts stored frozen and in the dark.	2A
System performance checks	Prior to initial calibration	• The tune must demonstrate a resolving power >10,000 at m/z 380.9760 and an acceptable mass calibration peak profile. • The isomer specificity check must and demonstrate a valley <25% for all peaks near 2,3,7,8-TCDD and 2,3,7,8-TCDF.	4
Initial calibration (ICAL)	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥5 standards. • Relative standard deviation (RSD) ≤20% for unlabeled compounds with an istopically labeled analog, and ≤35% for 1,2,3,7,8,9-HxCDD, OCDF, and labeled compounds. • Ion abundance ratios within ±15% of theoretical. • Signal to noise ratios >10.	2B
Continuing calibration (CCV)	Once every 12 hours	• % Difference ≤20% for unlabeled compounds with an istopically labeled analog, and ≤35% for 1,2,3,7,8,9-HxCDD, OCDF, and labeled compounds. • Ion abundance ratios within ±15% of theoretical. • Signal to noise ratios >10.	2B
Laboratory blank (LB)	One per preparation batch of ≤20 samples	< 5% of concentration in field samples.	2A
Ongoing precision and recovery (OPR/LCS)	One per preparation batch of ≤20 samples	Meets method-specified control limits for % recovery.	2A
Labeled compound recoveries	Each sample and QC sample	Meets method-specified control limits for % recovery.	2A
Second column confirmation	Each sample with a detection of 2,3,7,8-TCDF on a DB-5 column.	Analysis on dissimilar column to confirm identification of 2,3,7,8-TCDF. Second column confirmation is not required if resolution is achieved using an alternate column, such as RTX Dioxin-2.	2B

QC Element	Frequency	Criteria	Stage
Compound quantitation	Each sample	• A representative number of concentrations are recalculated from instrument responses • An example EDL, RL, RF, and RSD is recalculated from instrument responses. • A limited number of standard and labeled compound recoveries, and one RPD are recalculated from reported concentrations. • A labeled compound and/or OPR true value is recalculated from laboratory bench sheets.	3
Compound identification	Each sample	A representative number of results are evaluated for: • Characteristic ion signals maximize within the same 2 seconds. • Signal to noise ratio > 2.5. • Ion abundance ratios within ±15% of theoretical, or ±10% of the CCV, or result flagged as EMPC • RT within RT Window. • Free from PCDE interferences	4

ICP-MS Metals–SW846 Method 6020B

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must analyzed within 6 months if refrigerated and 2 years if frozen. Samples should be preserved with nitric acid.	2A
Initial calibration (ICAL)	Daily, prior to analyzing samples and after CCV criteria exceeded	• Single point standard and blank or ≥3 standards and a blank. • Coefficient of determination (R2) ≥0.995 if multipoint calibration	2B
Calibration verification (ICV/CCV)	After ICAL and after each 10 samples	Recoveries within 90-110%.	2B
Reporting Limit Standard (RL Std)	After single point ICAL	Recoveries within 80-120%.and within 1 RL of the true value.	2B
Calibration blank (ICB/CCB)	After each ICV and CCV	Concentrations > negative MDL and < 10% of concentrations in field samples.	2B
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	Concentrations < 10% of concentrations in field samples.	2A
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Recoveries within 80-120% and meeting performance-based control limits.	2A
Matrix spike (MS)	One per 20 samples	Recoveries within 75-125% and meeting performance-based control limits.	2A
Post-digestion spike (PS)	For each failing MS.	Recoveries within 75-125%.	2B
Serial Dilution	For each failing MS if high concentrations	Recoveries within 90-110% where original sample concentration > 50 x MDL.	2B
Duplicates	Matrix duplicate (LD) or MS dup (MSD) per 20 samples.	RPD < 20% and meeting performance-based control limits.	2A

Note: ICP-MS mass spectral tuning information and internal standard %relative abundance information are not provided on summary forms. Therefore, these are considered Stage 3 checks.

Mercury–SW846 Method 7471B

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must analyzed within 28 days. Transportation temperatures should be below 6°C.	2A
Initial calibration (ICAL)	Prior to analyzing samples, and after CCV criteria exceeded.	• Utilizes ≥3 standards and a blank. • Coefficient of determination (R2) ≥0.995	2B
Initial calibration verification (ICV)	After ICAL	Recoveries within 90-110%.	2B
Continuing calibration verification (CCV)	After each 10 samples	Recoveries within 80-120%	2B
Continuing calibration blank (ICB/CCB)	After each ICV and CCV	< 10% of concentrations in field samples.	2B
Laboratory blank (LB)	One per preparation (prep) batch of ≤20 samples	< 10% of concentrations in field samples.	2A

QC Element	Frequency	Criteria	Stage
Laboratory control sample (LCS)	One per prep batch of ≤20 samples.	Recoveries within 80-120.	2A
Matrix spike (MS)	One per 20 samples	Recoveries within 80-120%.	2A
Duplicates	Matrix duplicate (LD) or MS dup (MSD) per 20 samples.	RPD < 20%.	2A
Post-digestion spikes (PS)	For each failing MS.	Recoveries within 85-115%.	2B

Note: 2021 SCUM/DMMP extended frozen mercury holding times to 1 year for sites without known or potential elemental mercury releases. However, prior approval/documentation in the SAP is required.

Total Organic Carbon–SW846 Method 9060A

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must analyzed within 14 days if refrigerated and 6 months if frozen.	2A
Initial calibration (ICAL)	Prior to analyzing samples	Coefficient of determination (R2) ≥0.99.	2B
Calibration verification (ICV/CCV)	Every 15 samples	% difference <±10%.	2B
Laboratory blank (LB)	One per batch of ≤20 samples	< 10% of concentrations in field samples.	2A
Laboratory control sample (LCS) or SRM	One per batch of ≤20 samples.	Recoveries within 80-120% and meeting performance-based control limits.	2A
Matrix spike (MS)	One per batch of ≤20 samples.	Recoveries within 75-125% and meeting performance-based control limits.	2A
Matrix replicate	One per batch of ≤20 samples.	RSD ≤ 20% and meeting performance-based control limit	2A

Total Solids–Standard Methods SM2540 G

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must analyzed within 14 days if refrigerated and 6 months if frozen.	2A
Triplicate	One per batch of ≤ 20 samples	RSD ≤20% and within performance-based control limit.	2A

Dioxin Total Solids–Method D2216

QC Element	Frequency	Criteria	Stage
Holding times	Each sample	Samples must be analyzed within 1 year, preferably within 14 days of dioxin sample extraction.	2A
Duplicate	Not specified	If performed, RSD ≤20%	2A

APPENDIX K

WSP HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

MARCH POINT (WHITMARSH) LANDFILL
9663 SOUTH MARCH POINT ROAD,
ANACORTES, WASHINGTON
PROJECT US0041081.0037

Prepared by:

WSP USA Inc.
18300 Redmond Way, Ste 200
Redmond, WA 98052
USA

February 23, 2026

SITE-SPECIFIC HEALTH AND SAFETY PLAN

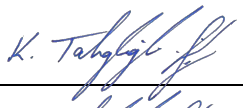
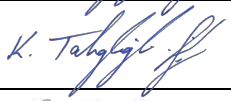
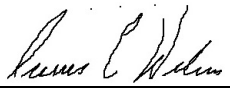
Project Name: March Point (Whitmarsh) Landfill

Project Location: 9663 South March Point Road, Anacortes, Washington

Project No.: US0041081.0037 Task No: 4

This Health and Safety Plan (HASP) addresses the health and safety hazards of each task conducted by WSP Inc. (WSP) employees for this project, including the requirements and procedures for worker protection (per Washington Administrative Code Chapter 296-843, the WSP Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment [HSE] Manual). The HASP was developed based on the hazards known or suspected to be present at the site, specifically as they relate to the work to be conducted by WSP employees. The hazards and controls within this HASP do not necessarily address all the hazards associated with subcontractor personnel. Subcontractors may use this document as a template for their own HASP; however, they will be responsible for reviewing and revising/amending the HASP to ensure that it addresses hazards unique to their operations.

The Site Health and Safety Officer (SHSO) can change or amend this document only with agreement from the Group Health, Safety, Security, and Environment Manager. The SHSO must initial any change made to the HASP at the relevant section and document the amendment date below. This document must be kept on site.

Prepared by:	Laurie Gneiding	WSP Managing Office:	Redmond WA
Approved by:	Koorus Tahghighi		February 23, 2026
	Project Manager		Date
Reviewed by:	Koorus Tahghighi		February 23, 2026
	Site Manager		Date
	Kyle Hanley		February 27, 2026
	SHSO		Date
Concurrence by:	Tré Wilson		February 23, 2026
	E&E HSE Director		Date
			Date

Amendment(s):

Prior to starting fieldwork, personnel (e.g., field personnel, subcontractors, authorized visitors, etc.) shall attend the pre-entry briefing covering the contents of this HASP. The briefing shall be conducted by the SHSO or designated representative and training documented by completing and signing the Site Orientation Form (**Appendix A**) and signing off on the WSP Field Team Review page of this HASP. By signing the Site Orientation Form and the WSP Field Team Review page, personnel acknowledge that they have attended the briefing, understand the potential safety and health hazards, and agree to perform work according to the requirements outlined in this HASP.

The SHSO will review the information covered in the pre-entry briefing meeting with any worker not in attendance at the initial meeting before beginning work. Brief meetings will be held at the beginning of each

workday to discuss important safety and health issues concerning tasks performed on that day and documented on the activity hazard analyses in **Appendix B**.

WSP Field Team Review: I acknowledge that I have read the requirements of this HASP and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions answered regarding the HASP and its requirements prior to performing field activities. Health and safety training and medical surveillance requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name	Date	Name	Date

WHITMARSH LANDFILL HASP SUMMARY SHEET

Table S-1. Anticipated Hazards

Task	Chemical	Slip/Trip/Fall	Excavation-related	Nuisance dust	Biological	Heavy Equipment	Underground Utilities	Working on/near Water	Noise	Heat Stress	Cold Stress	Sunburn	Flying debris
Oversight of Building Demolition (Completed)	X	X		X	X	X			X	X	X	X	X
Oversight of landfill slope modification	X	X	X	X	X	X	X	X	X	X	X	X	
Oversight of sediment curtain placement	X	X			X	X		X	X	X	X	X	
Oversight of landfill grading	X	X	X	X	X	X	X		X	X	X	X	
Oversight of landfill capping/seeding		X		X	X	X			X	X	X	X	
Oversight of dewatering/water treatment.	X	X			X				X	X	X	X	
Oversight of well and gas probe installation		X				X	X		X	X	X	X	

Level D is the basic ensemble for this site. personal protective equipment may be upgraded or downgraded by the Health, Safety, and Environment Coordinator after discussion with SHSO/Project Manager based on site conditions and air monitoring results.

Table S-2. PPE Requirements – Technical Oversight

PPE (Level D)	Task 1: Building Demolition	Task 2: Landfill slope modifications	Task 3: Sediment curtain placement	Task 4: Landfill grading	Task 5: Landfill capping/seeding	Task 6: Dewatering/ water treatment
Gloves	Cut-resistant outer	Cut-resistant outer(+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil/mud contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in groundwater or soil contact)
Feet	Safety-toe and shank boots	Safety-toe and shank boots	Hip waders, safety-toe & shank boots, plus mudders	Safety-toe and shank boots	Safety-toe and shank boots	Safety-toe and shank boots
Head	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat
Eye	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses
Ear1	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25
Other (PFD, waders, etc.)2	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest; ring buoy	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest

Notes:
1. Wear hearing protection around loud operating equipment (if a normal conversation is hard to make out at a distance of 3 feet).
2. Life jacket and ring buoy in accordance with WAC 296-155-235 *et seq*, as necessary.

Abbreviations:
NRR = noise reduction ratio
PFD = personal flotation device
PPE = personal protective equipment
WAC = Washington Administrative Code

Table S-3. Action Levels for Air Monitoring.

Hazard	Tasks	Action Level	Response
Explosive Atmosphere	2–5	<10% LEL (in occupied work area) 10–20% LEL>20% LEL	Work with caution. Continue monitoring. Work with caution. Continuous monitoring required. Explosion hazard. Withdraw from area immediately. Note: Combustible gas readings may not be accurate in atmospheres with <19.5% oxygen.
Oxygen	2–5	<19.5% (in occupied work area) 19.5–21.5% >22%	Oxygen deficient. Exit area. Continue work. Exit area, identify source, and contact safety management.
Nuisance dust/ lead-contaminated soil	1, 2, and 4	Total dust action level: appreciable visible dust (1 mg/m^3) for more than 15 minutes	Control dust w/ engineering controls (e.g., water spray). If unable to control dust, consult project manager.

Abbreviations:
LEL = lower explosive limit
mg/m^3 = milligrams per cubic meter

Table S-4. Emergency Contacts

Agency	Telephone Numbers	
Fire Department:	911	
Hospital: Island Hospital, Anacortes	360-299-1300	
Police Department:	911	
TriageNow (early injury case management)	877-311-0038	
Name	**Office**	**Cell/Home**
Project Health and Safety Officer: Tim Reinhardt, CIH	206-838-8464	425-241-5816
Client Contact: Margo Gillaspy	360-416-1578	NA
Project Manager: Koorus Tahghighi	NA	206-641-6301
Principal in Charge: Dave Haddock	NA	425-246-7409
Group HSE Manager: Trevon Wilson (See Incident Flow Chart in Appendix D)	NA	316-202-9030
Poison Control Center	800-732-6985	NA
Ecology Northwest Regional Office	425-649-7000	NA
Oil Spill Hotline	800-645-7911	NA
Washington Division of Emergency Management	253-512-8031	NA

TABLE OF CONTENTS

Site-Specific Health and Safety Plan ii
Whitmarsh Landfill HASP Summary Sheet iv
1 Site Background 1
2 Key Personnel and Health and Safety Responsibilities 2
3 Site Activities 5
3.1 Hazard Assessment 5
3.1.1 Project Applicable Life Saving Actions 6
3.2 Physical Hazards 6
3.2.1 Cold Stress 6
3.2.2 Heat Stress 7
3.2.3 Heavy Equipment 9
3.2.4 Oversight Of Drilling Activities 9
3.2.5 Underground Utilities 10
3.2.6 Noise 11
3.2.7 Slip, Trip, And Fall Hazards 11
3.2.8 Working on or Near Water 12
3.3 Biological Hazards 12
3.3.1 Flying Insects 12
3.3.2 Ticks/Spiders 12
3.3.3 Irritating Vegetation 13
3.3.4 Snakes, Vermin, Feral Animals 13
3.4 Chemical Hazards 13
4 Personal Protective Equipment Requirements 17
4.1 Work Limitations 17
4.2 Monitoring Equipment Requirements 17
5 Work Zone Delineation 19
5.1 Support Zone 19
5.2 Contaminant Reduction Zone 19
5.2.1 Personnel 19
5.2.2 Samples and Sampling Equipment 20
5.2.3 Heavy Equipment and Vehicles (as applicable) 20
5.3 Work Zone (Hot Zone) 20
5.4 Decontamination Wastes 20
6 Site Operating Procedures 20
6.1 Initial Site Entry Procedures 20
6.2 Daily Operating Procedures 21
6.2.1 Tailgate Safety Meetings 21
6.2.2 Site Rules 21
6.2.3 Inspections 21
6.3 Confined Space Entry Procedures 22
6.4 Buddy System 22
6.5 Communications 22

7 Subcontractors/Third Parties/Suppliers – Interface Arrangements 22
7.1 Compliance 23
7.2 Subcontractor Safety Responsibilities 23
7.3 Reporting by the Subcontractors 23
7.4 Equipment Operators 23
8 Required Training 24
8.1 Hazard Communication Training 24
8.2 Hazardous Waste Operations Training 24
8.3 First Aid 24
8.4 Orientation Training and Daily Safety Meetings 24
8.5 BNSF Training 25
9 Medical Surveillance Requirements 25
10 Sanitation/Illumination 25
11 Site Emergency Action Plan 25
11.1 Emergency Contacts 25
11.2 Emergency Response Procedures 26
11.2.1 Earthquake 27
11.2.2 Communicable Diseases 28
11.2.3 Medical Incidents 28
12 Recordkeeping 30

LIST OF TABLES

Table S-1. Anticipated Hazards iv
Table S-2. PPE Requirements – Technical Oversight v
Table S-3. Action Levels for Air Monitoring. vi
Table S-4. Emergency Contacts vi
Table 1. Key Personnel Health and Safety Responsibilities 3
Table 2. Anticipated Hazards 5
Table 3. Wind Chill Factors 7
Table 4. Heat Indices 8
Table 5. Possible Heat Disorders Based on Heat Index 8
Table 6. Rest Periods for Temperatures Exceeding 72.5°F 8
Table 7. Chemical Hazards 14
Table 8. PPE Requirements – Technical Oversight 18
Table 9. Action Levels for Air Monitoring 19
Table 10. Subcontractors 23
Table 11. Emergency Contacts 26
Table 12 Emergency Case Management Procedures 30

LIST OF FIGURES

Figure 1. Site Location Map 1
Figure 2. Project Organizational Chart 2
Figure 3. Route to Hospital 29

LIST OF APPENDICES

Appendix A Forms and Checklists
Appendix B Activity Hazard Analyses
Appendix C Safety Data Sheets (TBD)
Appendix D Incident Reporting
Appendix E Introduction to WSP Health, Safety, Security, and Environment Management Systems

ACRONYMS AND ABBREVIATIONS

AHAs	activity hazard analyses
CPR	cardiopulmonary resuscitation
dBA	A-weighted decibels
DOSH	Washington Division of Occupational Safety and Health
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSE	health, safety, and environment
IDLH	Immediately Dangerous to Life and Health
mg/m^3	milligrams per cubic meter
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEL	permissible exposure limit
PID	photoionization detector
PPE	personal protective equipment
REL	recommended exposure limit
SDS	Safety Data Sheet
SHSO	Site Health and Safety Officer
TLV	threshold limit value
WAC	Washington Administrative Code

1 SITE BACKGROUND

The former March Point (Whitmarsh) Landfill is located north of South March Point Road at the base of a bluff in the tidelands area of Padilla Bay (Figure 1). The former landfill is bounded by South March Point Road to the south, a BNSF Railway Company line and Padilla Bay to the north and northeast, and the Swinomish Channel to the east and southeast. The property was originally undeveloped tidelands lying between the main Mount Vernon-Anacortes highway and the BNSF rail line, and it was originally owned by the state of Washington and managed by the Washington Department of Natural Resources.

Landfilling began in the 1950s, when the site was used by the public as an unregulated dump site. In 1961, Skagit County applied for and received a lease from the State to operate the landfill as a regulated solid waste disposal site. Skagit County operated the landfill as a "burn dump" and burned waste regularly until 1969. In 1969 or 1970, Skagit County stopped burning activities and converted the facility to a "sanitary landfill operation." From 1969 through 1973, the landfill was Skagit County's primary waste disposal facility. Skagit County Public Works records of waste accepted from 1970 to 1973 indicate that waste originated from the cities of Anacortes, Burlington, La Conner, Mt. Vernon, and Sedro-Woolley; rural Skagit County; Whidbey Island; and the Shell and Texaco refineries, among other sources.

Powdered vanadium catalysts have been reportedly dumped at the landfill. Other industrial wastes, including drummed wastes, are alleged to have been dumped at the landfill. In 1973 Skagit County opened the Inman Landfill and closed this facility. Closure consisted of grading the waste and capping it with 2 to 3 feet of soil.

The northern two-thirds of the former landfill was occupied by a cedar log mill, which operated in this location from the late 1980s to the 2000s. This portion of the former landfill contains several former buildings, equipment, and debris associated with the mill operations. The southern third of the former landfill is unoccupied and covered with light forest and grass (Figure 1).

Results of previous studies conducted at the site were summarized in the remedial investigation/feasibility study. Contaminants detected in water include metals, polychlorinated biphenyls (PCBs), and pesticides; contaminants detected in soil include metals, semivolatile organic compounds, PCBs, and pesticides. Both upland and offshore areas have been identified for further investigation due to potential exceedances of Model Toxics Control Act cleanup levels in soil, groundwater, and/or sediments.

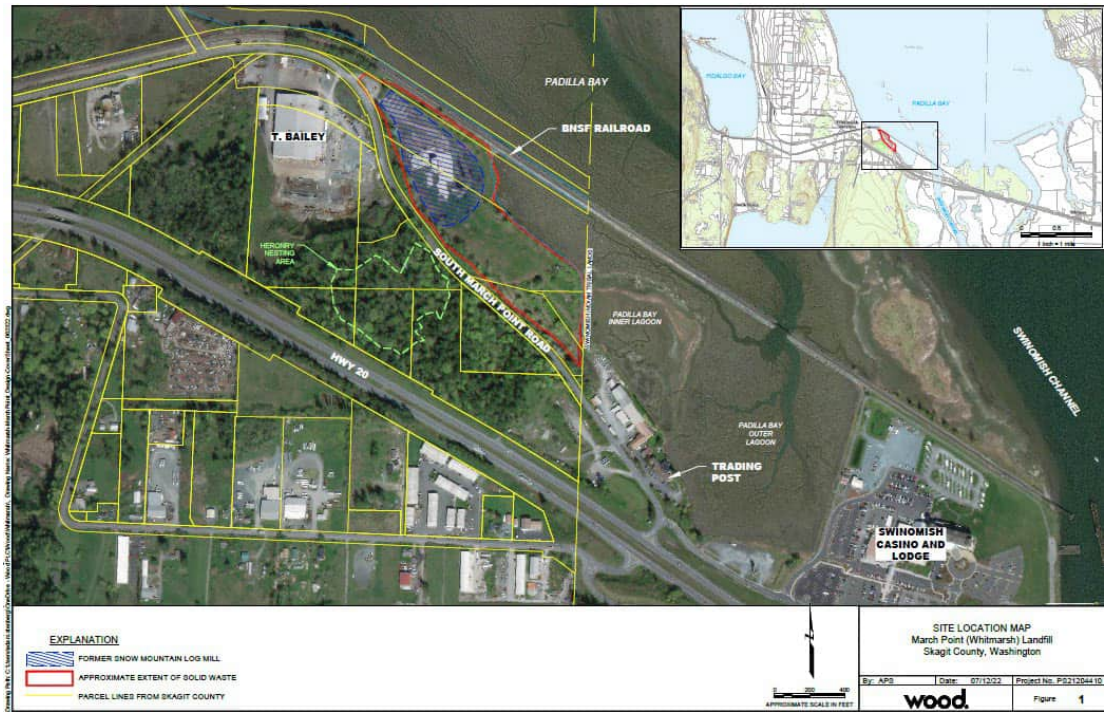
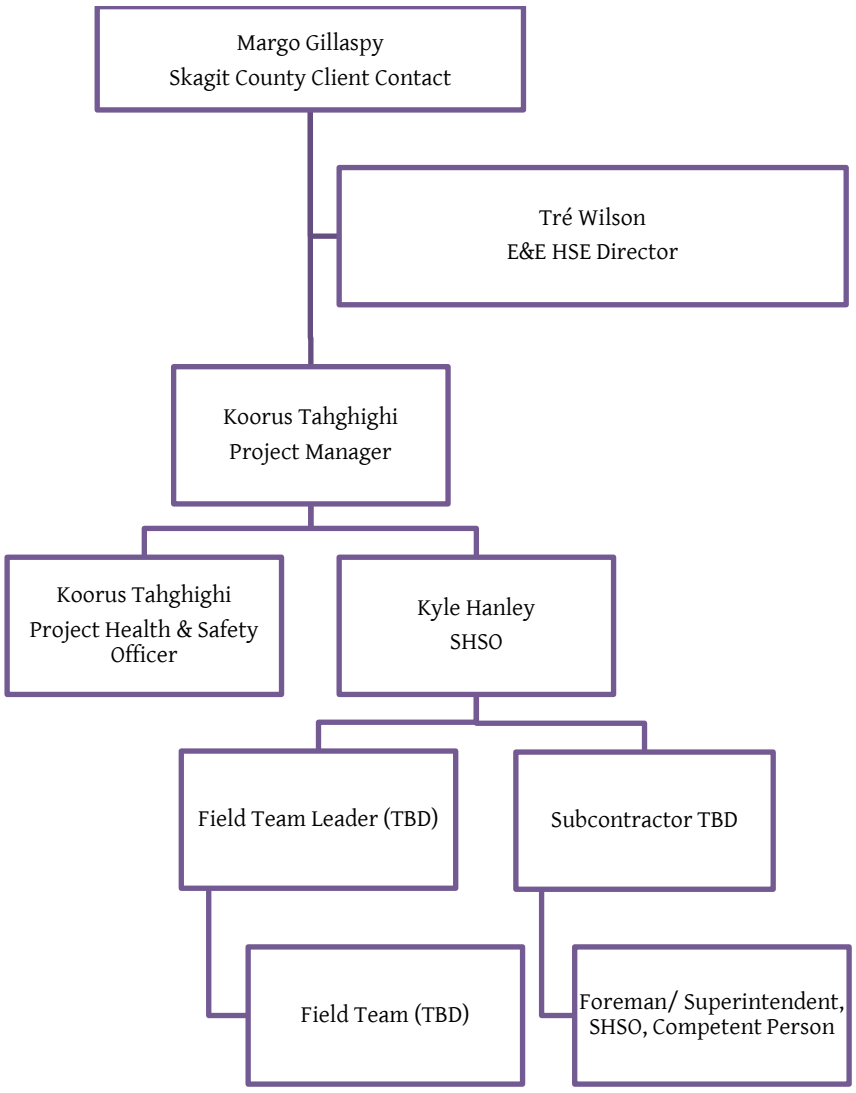


Figure 1. Site Location Map

2 KEY PERSONNEL AND HEALTH AND SAFETY RESPONSIBILITIES

The Project Manager has overall responsibility for health, safety and environment (HSE) on the project and is responsible for ensuring that the WSP HSE policy is communicated to site personnel, and that site personnel clearly understand their HSE roles and responsibilities on the project site.

Figure 2 shows the project organizational chart. **Table 1** describes health and safety responsibilities for key project personnel.



Abbreviations:
CIH = Certified Industrial Hygienist
HSE = health, safety, and environment
SHSO = Site Health and Safety Officer
TBD = to be determined

Figure 2. Project Organizational Chart

Table 1. Key Personnel Health and Safety Responsibilities

Position	Responsibilities
Group Senior HSE Manager	– Implement appropriate corporate health and safety policies, or environmental policies. – Approve HASP and amendments. – Notify E&E HSE Director of HSE in the event of an emergency situation. – Verify that corrective actions recommended on incident analysis forms (Appendix D) have been implemented. – Delegate project safety advisement as needed to a qualified project health and safety officer.
Project Manager	– Monitor that safety requirements of WSP, the client and relevant sections of OSHA regulations are applied and followed by employees, subcontractors, and visitors. – Ensure all project employees have the required training and are qualified to work in a safe manner. – Ensure employees are using the identified PPE and monitoring equipment. – Ensure HASP updates occur at least semi-annually or when conditions sufficient change or new hazards are observed. Communicate updates to site personnel. – Monitor organization of the work schedules and tasks to provide safe working conditions. – Verify that the safety meetings and inspections are performed as required. – Investigate all incidents fully, and coordinate with the SHSO regarding prevention of similar incidents in the future.
Site Manager	– Ensure HASP is read and understood by site personnel. Conduct and document tailgate safety meetings. – Use the Project Safety Readiness Review Checklist (Appendix A) to verify compliance with safety requirements. – Verify that appropriate monitoring equipment and PPE are available and used. – Manage any change by ensuring HSE risk assessments are conducted and AHAs developed for any new task. – Verify subcontractors have completed AHAs for their tasks. – Oversee subcontractor's compliance with safety regulations and contract requirements. – Ensure corrective actions identified on incident analysis forms (Appendix D) or from HSE inspections are implemented. – Enter reported or observed HSE hazard identifications and observations, into the iSMS database. – Report all incidents immediately and to arrange for medical treatment, as required, in case of injury or illness including transportation to a doctor or hospital.

Position	Responsibilities
Site Health and Safety Officer	– Implement project HASP. – Confirm site personnel meet proper medical requirements and have HAZWOPER training. – Ensure that subcontractor personnel have appropriate safety qualifications, training, certifications, that supervision and competent personnel are on site when the work is being conducted, subcontractors complete AHAs for their tasks, subcontractor inspections are being completed, and corrective actions are identified and closed. See the Project Safety Readiness Review Checklist (Appendix A). – Conduct pre-entry briefing and tailgate safety meetings. Document meetings on Tailgate Safety Meeting Form (Appendix A). – Verify that all monitoring equipment and PPE is operating correctly according to manufacturer's instructions and such equipment is used by on-site personnel. Calibrate or verify calibration of all monitoring equipment and record results. – Conduct weekly inspections of job site using the Site Safety and Health Checklist (Appendix A). – Implement site emergency and follow-up procedures, if necessary. – Enter reported or observed HSE hazard identifications and observations into the iSMS database.
Project Personnel	– Be familiar with and abide by the HASP. – Review AHAs before beginning tasks. – Wear required PPE. – Be aware of surroundings and perform a last-minute risk assessment before starting any task. – Notify the SHSO of any special medical conditions (e.g., allergies). – Immediately report any incidents and/or unsafe conditions or behavior observations to the SHSO. – Intervene and initiate your "Stop Work Authority" when hazardous conditions are identified.
Subcontractors	– Prepare and implement a HASP covering all job activities associated with the site. – Participate in HSE meetings (e.g., tailgates, safety committee, etc.). – Designate a subcontractor employee to act as a Competent Person, when required by regulation. – Understand and comply with WSP HSE policies and procedures and regulatory requirements applicable for their scope of work. – Do not direct or permit any employee to work under conditions that are not in compliance with any applicable OSHA standards. – Determine schedule and conduct inspections of their work area and equipment to ensure equipment is in good working order and work site hazards are identified and corrected. Schedule will be based on safe work practices and regulatory requirements. – Document any findings and will track corrective actions to closure. – Develop and provide WSP with a copy of their AHAs for each major phase of work prior to starting that work. – Follow emergency procedures outlined in their own HASP if they have been coordinated with the WSP HASP and follow regulatory requirements.

Abbreviations:
AHAs = activity hazard analyses
HASP = health and safety plan
HAZWOPER = Hazardous Waste Operations and Emergency Response
HSE = health, safety and environment
OSHA = Occupational Safety and Health Administration
PPE = personal protective equipment
SHSO = Site Health and Safety Officer

3 SITE ACTIVITIES

Tasks covered in this Health and Safety Plan (HASP) include oversight of the following:

- Building demolition;
- Landfill activities:
  - Modification of landfill slopes to consolidate buried waste into main portion of landfill,
  - Placement of clean fill,
  - Grading of top and perimeter of landfill,
  - Installation of groundwater monitoring wells and landfill gas probes,
  - Installation of landfill gas passive ventilation piping and compaction, and
  - Capping and seeding;
- Placement of temporary erosion control measures, including sediment curtain along water line; and
- On-site dewatering and water treatment prior to discharge to the sanitary sewer.

3.1 HAZARD ASSESSMENT

The scope of work to be performed and potential hazards to WSP personnel are provided in **Table 2.** Hazards to subcontractors will be covered in the subcontractors' HASP. Activity hazard analyses (AHAs) for each task or group of similar tasks are provided in **Appendix B**.

Table 2. Anticipated Hazards

Task	Chemical	Slip/Trip/Fall	Excavation-related	Nuisance dust	Biological	Heavy Equipment	Underground Utilities	Working on/near Water	Noise	Heat Stress	Cold Stress	Sunburn	Flying debris
1. Oversight of building demolition (completed)	X	X		X	X	X			X	X	X	X	X
2. Oversight of landfill slope modification	X	X	X	X	X	X	X	X	X	X	X	X	
3. Oversight of sediment curtain placement	X	X			X	X		X	X	X	X	X	
4. Oversight of landfill grading	X	X	X	X	X	X	X		X	X	X	X	
5. Oversight of landfill capping/seeding		X		X	X	X			X	X	X	X	
6. Oversight of dewatering/ water treatment	X	X			X				X	X	X	X	
7. Oversight of well and probe installation		X			X	X	X		X	X	X	X	

3.1.1 PROJECT APPLICABLE LIFE SAVING ACTIONS

The WSP Life Saving Actions checked in the list below potentially apply to the work being conducted at the site:

- Driving - Follow safe driving rules;
- Energy Sources - Verify isolation and zero energy before work begins;
- Ground stability – Inspect all excavations, ground structures and ground support prior to working;
- Hazardous Atmospheres – Test and monitor the atmosphere before entering and during work, obtain authorization before entering a confined space;
- Lone or Remote Work – Establish a communication plan with reporting times and escalation procedures.
- Suspended Loads - Plan lifting operations and control the area, keep yourself and others out of the line of fire;
- Work around heavy Mobile Equipment – Establish and obey signage, pedestrian paths, barriers and exclusion zones;
- Working at Height - Protect yourself against a fall when working at height; and
- Working On or Near Water – Assess weather and environmental conditions, wear proper PPE, and establish a rescue plan.

Expected start date:	April (end of March) 2026
Expected duration of project:	End December 2026
Expected average number of workers on site per day:	TBD

3.2 PHYSICAL HAZARDS

3.2.1 COLD STRESS

Weather conditions for workers outdoors during the winter months are conducive to producing cold stress. Two factors influence the development of a cold injury: ambient temperature and wind velocity. Wind chill is used to describe the chilling effects of moving air in combination with low temperature (**Table 3**). As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 miles per hour increases to 10 miles per hour. When using impermeable clothing (e.g., Saranex or Tyvek) and if the body is soaked with perspiration, the body is suddenly cooled when personal protective equipment (PPE) is removed. Because water conducts heat 240 times faster than air, the effects of cold are intensified if there is wind chill when the body is perspiration-soaked.

The areas of the body most susceptible to cold injury are those with high surface area to volume ratio (fingers, toes, nose, ears). Severe injury to these extremities may occur with extreme cold temperatures.

Table 3. Wind Chill Factors

Wind Speed (mph)	Local Temperature, ºF										
	32	23	14	5	-4	-13	-22	-31	-40	-49	-58
	Equivalent Temperature, °F										
Calm	32	23	14	5	-4	-13	-22	-31	-40	-49	-58
5	29	20	10	1	-9	-18	-28	-37	-47	-56	-65
10	18	7	-4	-15	-26	-37	-48	-59	-70	-81	-91
15	13	-1	-13	-25	-37	-49	-61	-73	-85	-97	-109
20	7	-6	-19	-32	-44	-57	-70	-83	-96	-109	-117
25	3	-10	-24	-37	-50	-64	-77	-90	-104	-117	-121
30	1	-13	-27	-41	-54	-68	-82	-97	-109	-123	-137
35	-1	-15	-29	-43	-57	-71	-85	-99	-113	-127	-142
40	-3	-17	-31	-45	-59	-74	-87	-102	-116	-131	-145
45	-3	-18	-32	-46	-61	-75	-89	-104	-118	-132	-147
50	-4	-18	-33	-47	-62	-76	-91	-105	-120	-134	-148
LITTLE DANGER FOR PROPERLY CLOTHED PERSONS Maximum danger of false sense of security				**CONSIDERABLE DANGER** Danger from freezing of exposed flesh within one minute		**VERY GREAT DANGER** Flesh may freeze within 30 seconds					

Note: Trench foot and immersion foot may occur at any point on this chart.
Abbreviations:
°F = degrees Fahrenheit

3.2.2 HEAT STRESS

Heat stress monitoring of workers and the environment will be initiated by the Site Health and Safety Officer (SHSO) when the ambient temperature exceeds 80 degrees Fahrenheit ˚F, or when the ambient temperature exceeds 52˚F if work is to occur in nonbreathable PPE, such as chemical resistant suits. Based on the heat index (**Table 4**) and potential dangers working at extreme temperatures and humidity (**Table 5**), field personnel will follow the work/rest periods listed in **Table 6**. It is important to note that elevated temperatures can significantly increase fatigue levels and negatively affect fitness for duty. Employees exposed to high heat conditions may experience quicker onset of fatigue. For activities that occur during high heat conditions, SA 217 Fit for Duty and Fatigue Management should be referenced to adjust work schedules.

Table 4. Heat Indices

Temp. (°F)	Relative Humidity									
	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
104	137									
102	130	137								
100	124	129	136							
98	117	123	128	134						
96	112	116	121	126	132					
94	106	110	114	119	124	129	135			
92	101	105	108	112	116	121	126	131		
90	97	100	103	106	109	113	117	122	127	132
88	93	95	98	100	103	106	110	113	117	121
86	89	91	96	95	97	100	102	105	108	112
84	86	88	89	90	92	94	96	98	100	103
82	84	84	85	86	88	89	90	91	93	95
80	81	82	82	83	84	84	85	86	86	87

Abbreviations:
°F = degrees Fahrenheit

Table 5. Possible Heat Disorders Based on Heat Index

Category	Heat Index (°F)	Possible Heat Disorders for People in High-Risk Groups
Extreme Danger	>130	Heat stroke and sunstroke likely.
Danger	105–129	Sunstroke, muscle cramps, heat exhaustion likely. Heatstroke likely w/prolonged exposure or physical activity.
Extreme Caution	90–105	Sunstroke, muscle cramps, heat exhaustion possible w/prolonged exposure or physical activity
Caution	80–90	Fatigue possible w/prolonged exposure or physical activity

Abbreviations:
°F = degrees Fahrenheit

Table 6. Rest Periods for Temperatures Exceeding 72.5°F

Temperature (°F)	Normal Work Clothing	Impermeable Work Clothing
>90	After each 45 minutes of work	After each 15 minutes of work
87.5–90	After each 60 minutes of work	After each 30 minutes of work
82.5–87.5	After each 90 minutes of work	After each 60 minutes of work
77.5–82.5	After each 120 minutes of work	After each 90 minutes of work
72.5–77.5	After each 150 minutes of work	After each 120 minutes of work

Abbreviations:
°F = degrees Fahrenheit

The warning symptoms of heat stress include fatigue; loss of strength; reduced accuracy; comprehension and retention; and reduced alertness and mental capacity. Heat stress is a collection of six heat-related illnesses:

1. *Heat edema,* which is characterized by swollen feet.
2. *Heat rash (prickly heat),* which is caused by tight clothing and aggravated by heat and humidity.
3. *Heat syncope,* which is a brief and sudden loss of consciousness brought on by dehydration, venous pooling (lack of movement), and/or isometric straining. It occurs more in sunlight, even w/o elevated temperatures.

4. *Heat cramps* in the hands, feet, or abdomen, which is caused by profuse sweating, inadequate salt intake, and/or inadequate fluid intake.
5. *Heat exhaustion*, also known as *heat toxemia* or *sunstroke*, which results from dehydration caused by decreased blood circulation. The symptoms include pallor, cool moist skin, nausea, headache, dizziness, "chills," sweating, and body temperature greater than 98.6°F but less than 104°F.
6. *Heat stroke,* which is the most severe form of heat stress whereby the body's normal regulatory mechanisms are overcome. The individual exhibits an altered mental state; red, hot usually dry skin (stopped sweating); nausea; strong rapid pulse; and a body temperature above 104°F (proteins denature at 107°F). If left untreated, the individual may exhibit delirium, convulsions, lapse into a coma, and possible death. *PERSONS EXHIBITING THESE SYMPTOMS SHOULD BE TRANSPORTED IMMEDIATELY TO HOSPITAL.*

Personnel shall monitor themselves for heat stress as instructed by the SHSO. Self-monitoring shall include checking of pulse rate within two to five minutes into the work break. A pulse rate greater than 110 beats per minute shall require shortening of the next work period by one-third the time. A pulse rate greater than 110 beats per minute the next rest period shall warrant the same action, etc. Heat stress monitoring will be coordinated and documented by the SHSO. The SHSO will also ensure that a sufficient quantity of suitably cool drinking water and access to shade is available to field personnel as required by WAC 296-307-97 Outdoor Heat Exposure and SA 309 Heat Illness Prevention.

3.2.3 HEAVY EQUIPMENT

During demolition and earth-moving operations, working components of heavy equipment (e.g., excavators) are periodically raised overhead and moved laterally. Thus, workers may be exposed to swinging equipment during operations, or may be exposed to crushing hazards if equipment falls or is carelessly lowered. Loose clothing may become entangled in cables/hydraulics used to raise and lower equipment or on the equipment itself. Lowered buckets may further pose a crushing hazard to hands or feet. Rough edges on buckets may cause cuts and abrasions. In accordance with SA 310 Mobile and Heavy Equipment, controls for equipment hazards include the following:

- Operate excavators, dump trucks, and other construction equipment in a safe manner. Equipment shall be operated by experienced operators.
- Inspect heavy equipment and components prior to bringing equipment on site, as well as on a daily basis, for unsafe conditions and/or faulty components, such as worn hydraulic hoses, excessive broken strands on wire cables, fuel line leaks, missing pins/bolt attachments, etc.
- Equip heavy equipment shall be equipped with a night-time backup alarm to alert workers.
- Establish a work zone around construction equipment and permit only those personnel and equipment required for the task within the zone.
- Make acknowledged eye contact with operator prior to approaching working equipment from the front and within view of the operator. The operator should put the bucket on the ground and remove hands from controls before personnel come within the swing radius.
- Wear appropriate clothing and equipment (site workers). Avoid wearing loose clothing.
- Wear work gloves to prevent cuts and abrasions from exposed spurs, wires, and edges on construction equipment. Operators should not have exposed jewelry.
- Train equipment operators in the operational hazards associated with the equipment, including safety features built into the equipment.
- Wear hearing protection when working around operating equipment.
- Do not get off or on any equipment while it is in motion.

- Operate machinery or equipment in a manner that will protect persons or property, including the operation of equipment at safe speeds and weight limits to be enforced.
- Wear PPE necessary to complete the task in a safe manner at all appropriate times.
- Employ good housekeeping principles:
- Store ancillary equipment in appropriate locations when not in use.
- DO NOT store/transport equipment on the excavator/backhoe.
- Keep work areas and controls free of materials, debris, & obstructions. Do not throw or drop tools.
- Heavy equipment shall possess adequate fire suppression equipment.

General safety procedures for construction equipment include:

- Operate construction equipment only from position of controls. Place in neutral before leaving control area.
- Do not smoke on any construction equipment.
- Do not operate construction equipment in icy/wet conditions or during electrical storms.
- Operate equipment within the rate capacity of hooks, rings, links, swivels, shackles, and other lifting aids.
- Keep excavator/backhoe buckets and dump truck beds lowered if the truck is unattended. Do not leave a suspended load unattended.
- Maintain excavator/backhoe on level ground with no distraction or disturbances for the operator.
- Stay clear of rotating parts.
- Maintain a distance of at least 15 feet from wires for heavy equipment.
- Operators shall not engage in any activity that would distract attention from the proper operation of the equipment.

3.2.4 OVERSIGHT OF DRILLING ACTIVITIES

Staff will stay clear and uphill of rig when moving the rig. When working on a slope, position personal and equipment uphill of the rig and keep a safe distance (30 feet min) from the drill rig when moving from boring to boring. A spotter should be used when reversing or navigating in tight spaces. Avoid standing in blind spots, engage in communication (verbal or signal) with drill rig operator and wait for the rig to be disengaged before approaching. Set and maintain a safe working distance from the rig prior to beginning drilling. WSP staff will keep away from the drill rig when in operation and make sure the operator knows where support staff are located at all times. It is important to be cautious of flying debris and liquids during auger drilling and rock coring. Sample tables and work areas should be set up at a distance equal to or greater than the fully extended mast plus 5 feet.

3.2.5 UNDERGROUND UTILITIES

Utilities may include utility lines, such as water, electric, gas, or telephone, as well as tanks, process piping, and sewers. If equipment is contacted or damaged, it can result in injury or death to workers, interruption of service, contamination of water, disruption of processes, and other costly delays.

WSP will ensure that the requirements of the WSP's Excavation, Trenching and Shoring procedure S.2.2.13 and Overhead and Underground Utility procedures SA 313 are adhered to prior to ground disturbance, including completion of the Excavation Checklist (**Appendix A**) by the competent person. If conflicting information exists on the location of utilities, if for any other reason the project manager, field manager, or site workers are uncertain as to the location of the utilities, or if gravel or other fill material is encountered, excavations will be conducted by hand digging.

3.2.6 NOISE

Activities conducted around noise-generating machinery, construction activities, demolition, and heavy equipment may expose workers to noise exceeding the DOSH exposure limit 85 A-weighted decibels (dBA) 8 hour-time weight average. The following effects can result from this noise:

- ***Psychological effects:*** workers being startled, annoyed, or distracted;
- ***Physiological effects:*** pain, temporary and/or permanent hearing loss, reduced muscular control (when exposure is severe); and
- ***Communication interference:*** increase in potential hazards due to the inability to warn of danger or properly issue instructions.

The hierarchy of controls listed in HS-EE-PRO-SA 216 Hearing Conservation Program dictates that elimination of the noise is most effective, followed by replacement of the noise, such as using quieter equipment or tools. The next recommended control is to isolate staff from the noise hazard, followed by limiting time exposure. If all of the above controls have been implemented to the maximum extent, only PPE remains at the bottom of the hierarchy as the least effective control.

It is anticipated that situations may arise when workers may be exposed to noise levels in excess of the 85 dBA, at which time each person will be provided with hearing protection, including during drilling operations and sampling operations when a generator is in use. The SHSO will require the use of hearing protection any time noise levels are high enough that a conversational tone of voice is difficult to hear at a distance of 3 feet.

Hearing protection maintenance includes the following practices:

- Do not reuse disposable ear plugs,
- Wash reusable plugs and canal caps to guard against dirt and bacteria,
- Wash and disinfect earmuffs,
- Discard reusable plugs or canal caps if they become hard or discolored,
- Replace worn cushion on earmuffs, and
- Store hearing protection in a clean plastic bag.

3.2.7 SLIP, TRIP, AND FALL HAZARDS

Slips, trips, and falls are the number one reason for injury on hazardous waste sites due to the combination of the large amount of equipment and the potential for PPE that restricts sight. Slips, trips, and falls will be minimized through implementation of the following housekeeping practices at all work sites:

- Store loose or light material and debris in designated areas and/or containers.
- Ensure tools, materials, extension cords, hoses, or debris are located so as not to cause tripping or other hazards. Adequately secure tools, materials, and equipment subject to displacement or falling.
- Secure all excavations, trenches, ditches, etc. and post as necessary.
- If possible, work on level ground. Work zones may have to be altered to ensure a safe, reasonably level area. Examine the work zones before work commences to select the safest areas to set up.
- Immediately clean any incidental fuel or fuel oil spills with absorbent material, and covered with sand or soil to preclude slipping.
- Avoid areas covered in ice/snow or remove the ice and snow, if possible.
- Clean any spills immediately.
- Remove obstacles from walkways and always keeping them free of clutter. When on site, ensure your work area is free of clutter (tripping on drill stems, tools, coolers, bottles etc.)

3.2.8 WORKING ON OR NEAR WATER

During placement of the sediment curtain, it will be necessary to work in or near water bodies. The banks of the bay in these areas may be soft and care should be taken to ensure safe entry and exit without getting stuck. "Mudder" high-flotation mud boots will be donned prior to walking into muddy intertidal areas on the site. Employees should be familiar with depth, tides, currents, and bottom conditions prior to working near water. No employee shall be permitted to work alone if there is a danger of drowning. Additionally, a personal flotation device is required for persons working over or within 6 feet of a large body of water. The AHA for sediment curtain placement oversight addresses these hazards and is included in **Appendix B**.

3.3 BIOLOGICAL HAZARDS

Biological hazards are represented by potential exposure to poison vegetation (e.g., poison oak and poison ivy) and insects (e.g., mosquitoes, ticks, wasps, bees, deer flies) and spiders.

3.3.1 FLYING INSECTS

Mosquitoes are flying insects that feed on the blood of warm-blooded animals in order to reproduce. Preventive measures include covering exposed skin and wearing a repellent that contains DEET. Personnel should be screened for allergic reactions to DEET before applying DEET to their skin. Stinging insects such as bees and wasps are common outdoor hazards prevalent in spring-fall seasons. Managing hazards from flying insects is included in the general site work AHA in **Appendix B**.

3.3.2 TICKS/SPIDERS

Spiders vary in size and are found in brush, woods, and vegetation. Western Washington has few spiders of medical concern, only yellow sac spiders and occasionally female black widow spiders. Hobo spider venom is not as toxic as once thought and they are not aggressive. Brown recluse spiders do not live in the state. Preventive measures to avoid spider bites are wearing gloves, avoiding touching spider webs, and checking clothing after being in the field.

Ticks are tiny and are found in brush, woods, and tall grass. May and June are the worst months for potential exposure, but the ticks are active in all months when the temperature exceeds 45°F. Preventative measures to avoid exposure to ticks include the following:

- Field personnel should wear long pants and long-sleeved shirts. It is recommended that pant cuffs be tucked inside the work boots or socks. Shirts should be tucked in. The use of light colored clothing may make it easier to spot ticks.
- Tick repellent should be applied to clothing and skin during the peak season. Permethrin containing repellent may be sprayed near the openings on work clothes (pant bottoms and waistband); permethrins should not be used on skin. On skin, DEET-containing repellent (< 33% DEET) should be applied. DEET should not be used on the face.
- All personnel should check for the presence of ticks or tick bites every day. Skin and hair should be checked for ticks. Many people get a spot on their skin in three to 30 days following a tick bite; the spot looks like a small red bullseye that is spreading out.
- If a tick is observed on the skin, it should be removed immediately: hold a tweezer on the tick as close to the skin as possible and pull. Kill the tick and retain for examination by a physician. WSP employees must report the incident to WorkCare and follow the WorkCare tick bite protocol.
- Performance of a blood test is appropriate following exposure to a tick bite. The Lyme blood test may not indicate positive results until two weeks or more after a tick bite. (Note: Ticks should not be killed with or stored in any liquid as this makes testing for Lyme disease impossible).

3.3.3 IRRITATING VEGETATION

To reduce the chances of dermatitis caused by poison oak, poison ivy or stinging nettle, personnel should wear long sleeves and long pants. Any exposed skin should be wiped downed several times a day with baby wipes or apply a blocking product (e.g., "Ivy Block").

3.3.4 SNAKES, VERMIN, FERAL ANIMALS

Snakes, vermin, and other animals may be present at the sites, particularly in vegetated areas, adjacent to stream/wetlands, or in/around non-occupied buildings. Personnel should check for the presence of these animals every day and avoid contact. There are no poisonous snakes resident in Western Washington.

3.4 CHEMICAL HAZARDS

Chemical hazards previously detected at the site are provided in **Table 7** along with their respective PELs. Based on their maximum detected concentrations in site soil samples, an inhalation hazard from site contaminants is not likely from exposure to airborne site dust. Incorporating a health-conservative safety factor of four, only lead would contribute appreciably to an inhalation hazard to site workers, and the airborne dust level would have to exceed 33 milligrams per cubic meter (mg/m^3), more than double the nuisance dust exposure limit of 15 mg/m^3.

The listed potential health effects are for exposure to high concentrations of these chemicals. There is no appreciable likelihood of encountering such concentrations from contact with soil, groundwater or airborne dusts that could be created on site, based on existing site characterization data.

Pursuant to section 5.0 of SA303 Hazard Communication Planning, an SDS (Safety Data Sheet) for any chemical brought onsite will be available to all staff onsite. All contractors shall provide an SDS for any applicable chemical hazards required onsite to the SSO .

Table 7. Chemical Hazards

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Arsenic	21 µg/L 14 mg/kg	0.002 mg/m^3	NIOSH POC: 5 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Ulceration of nasal septum, dermatitis	Respiratory irritation
Cadmium	2.7 mg/kg	0.005 mg/m^3	NIOSH POC: 5 mg/m^3	Strong oxidizers, elemental sulfur, selenium, tellurium	Inhalation, dermal contact	Chest pain, cough with bloody sputum, irritability, weakness, nausea, diarrhea, abdominal pain, burning sensation, salivation, cramps	difficulty breathing, sore throat, “metal fume fever” (shivering, sweating, body pains, headache), dizziness
Copper	38 µg/L 373 mg/kg	1 mg/m^3	100 mg/m^3	Oxidizers, alkalis	Inhalation, dermal contact	Eye irritation, dermatitis	Nose irritation, nasal septum perforation
Lead	24 µg/L 238 mg/kg	0.05 mg/m^3	1,000 mg/m^3	Strong oxidizers, hydrogen peroxide, acids	Inhalation, dermal contact	Eye irritation	Weakness, exhaustion, insomnia, anorexia, malnutrition, kidney disease
Manganese	782 µg/L	5 mg/m^3	500 mg/m^3	Oxidizers; reacts with water/ steam to product hydrogen gas	Inhalation	NA	Respiratory irritation, chest tightness, cough, dry throat
Mercury	6.9 mg/kg	0.1 mg/m^3	10 mg/m^3	Acetylene, ammonia, bleach, copper	Inhalation, dermal contact	Eye/skin irritation	Cough, chest pain, difficulty breathing, bronchitis, pneumonitis, irritability, headache
Molybdenum	40 µg/L 6 mg/kg	10 mg/m^3	5,000 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Eye irritation	Respiratory irritation
Nickel	72.2 µg/L 99 mg/kg	1 mg/m^3	10 mg/m^3	Strong acids, sulfur, wood & other combustibles	Inhalation, dermal contact	Contact dermatitis or hypersensitivity	Respiratory and nasal irritation, dizziness, giddiness, weakness
Strontium	72 mg/kg	NA	NA	NA	Inhalation, dermal contact	Skin/eye irritation	NA
Zinc	150 µg/L 381 mg/kg	5 mg/m^3	NA	Strong oxidizers	Inhalation (dust)	Skin lesions	Coughing, irritation
Benzo-(a)anthracene[5]	270 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation; dermal contact	Dermatitis	Bronchitis (potential occupational carcinogen)

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Benzo-(a)pyrene[5]	240 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation; dermal contact	Dermatitis	
Bis(2-ethylhexyl) phthalate	6,000 mg/kg	5 mg/m^3	5,000 mg/m^3	Nitrates, strong oxidizers, acids, alkalis	Inhalation; dermal contact	Skin/eye irritation	Mucous membrane irritation
Chrysene[5]	320 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Dermatitis	Bronchitis (potential occupational carcinogen)
TPH-G	310 mg/kg	NA	NA	Strong oxidizers	Inhalation, dermal contact	Irritation of eyes, skin, mucous membrane; dermatitis	headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, possible liver, kidney damage (potential occupational carcinogen)
Aroclor 1254	240 mg/kg	0.5 mg/m^3	5 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Chloracne, eye irritation	Reproductive effects, liver damager
Total PCBs	0.14 µg/L 690 mg/kg	NA	NA	NA			
Aldrin	390 mg/kg	0.25 mg/m^3	25 mg/m^3	Acids, oxidizers, phenol	Inhalation, dermal contact	Headache, dizziness, nausea, vomiting (potential carcinogen)	
Alpha-BHC	0.41 µg/L	0.5 mg/m^3	50 mg/m^3	Corrosive to metals	Inhalation, dermal contact	Eye/skin irritation	Nose throat irritation, headache, respiratory difficulty
Delta-BHC	120 mg/kg						
4,4'-DDD[6]	0.0082 µg/L	1 mg/m^3	500 mg/m^3	Strong oxidizers, alkalis	Inhalation, dermal contact	Eye/skin irritation	Parasthesia tongue, lips, face; tremors, anxiety, dizziness, confusion
Dieldrin	210 mg/kg	0.25 mg/m^3	50 mg/m^3	Strong oxidizers, sodium, strong acids, phenols	Inhalation, dermal contact	Headache, dizziness, nausea, vomiting, sweating; coma	
Methoxychlor	71 mg/kg	15 mg/m^3	5,000 mg/m^3	Oxidizers	Inhalation; dermal contact	NA	NA

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Nuisance dusts	NA	PEL: 10 mg/m^3 total particulates, 5 mg/m^3 respirable particulates	NA	varies	Incidental ingestion, inhalation, dermal contact	Skin irritation	Irritation eyes, throat, upper respiratory system

Notes:

1. Concentration based on the highest single soil sample.
2. Represents the maximum allowable 8-hour time-weighted average exposure concentration.
3. Based on a 10-hour time-weighted exposure.
4. The concentration to which a person could be exposed for 30 minutes without experiencing escape-impairing or irreversible health effects.
5. Based on coal tar pitch volatiles.
6. Based on 4,4-DDT.

Abbreviations:

µg/L = micrograms per liter
4,4'-DDD = 4,4′-Dichlorodiphenyldichloroethane
4,4'-DDT = 4,4′-Dichlorodiphenyltrichloroethane
IDLH = immediately dangerous to life and health
mg/kg = milligrams per kilogram
mg/m^3 = milligrams per cubic meter
NA = not applicable
NIOSH = National Institute for Occupational Safety and Health
PCB = polychlorinated biphenyl
PEL = permissible exposure limit
POC = potential occupational carcinogen
REL = recommended exposure limit

4 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Level D is the basic ensemble for this site. PPE may be upgraded or downgraded by the Health, Safety, and Environment (HSE) Coordinator after discussion with SHSO/Project Manager based on site conditions and air monitoring results. The PPE required for each task is listed in **Table 8**.

4.1 WORK LIMITATIONS

All work will be conducted during daylight hours unless proper lighting is provided in accordance with DOSH and OSHA regulations.

4.2 MONITORING EQUIPMENT REQUIREMENTS

The SHSO or designee will conduct air monitoring as necessary. Existing data do not warrant daily air monitoring for site contaminants, as there are no appreciable volatile organic compounds in the site contaminants. Airborne dusts air the only likely pathway for inhalation exposure to nonvolatile and semivolatile organic compounds. Modeling using the maximum reported concentration in site soil samples results in a mixture exposure limit of 1.0 (unitless ratio) for site contaminants only after disturbed soils reached an 8-hour average concentration above 30 $mg/m^3$of air. This is with a safety factor of four, which is a health-conservative assumption. Because the nuisance dust PEL is 15 mg/m^3, occupational dust exposures should never reach such high levels. Dust is readily visible at a concentration of 1.0 mg/m^3. The SHSO will observe activities that disturb site soils and require dust controls if visible dust levels are sustained for more than five minutes.

Site wells in the vicinity of the former sawmill have substantial methane concentrations at the wellhead upon initial opening, but these levels quickly dissipate. The SHSO will screen work area concentrations close to any newly-opened ground penetration, such as a monitoring well, using a four-gas meter to check oxygen and lower explosive limit, in that order. Monitoring readings will be logged in the field notebook. Direct reading instrumentation shall be calibrated in accordance with manufacturing requirements, (at least daily), and results of the calibration shall be documented in the field notebook. Action levels for each hazard are provided listed for each task in **Table 9**.

Table 8. PPE Requirements – Technical Oversight

PPE (Level D)	Task 1: Building Demolition	Task 2: Landfill slope modifications	Task 3: Sediment curtain placement	Task 4: Landfill grading	Task 5: Landfill capping/seeding	Task 6: Dewatering/ water treatment
Gloves	Cut-resistant outer	Cut-resistant outer(+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil/mud contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in groundwater or soil contact)
Feet	Safety-toe and shank boots	Safety-toe and shank boots	Hip waders, safety-toe & shank boots, plus mudders	Safety-toe and shank boots	Safety-toe and shank boots	Safety-toe and shank boots
Head	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat
Eye	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses
Ear[1]	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25
Other (PFD, waders, etc.)[2]	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest; ring buoy	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest

Notes:
1. Wear hearing protection around loud operating equipment (if a normal conversation is hard to make out at a distance of 3 feet).
2. Life jacket and ring buoy in accordance with WAC 296-155-235 *et seq*, as necessary.

Abbreviations:
PFD = personal flotation device
PPE = personal protective equipment
NRR = noise reduction ratio
WAC = Code of Federal Regulations

Table 9. Action Levels for Air Monitoring

Hazard	Tasks	Action Level	Response
Explosive Atmosphere	2–5	<10% LEL (in occupied work area) 10–20% LEL>20% LEL	Work with caution. Continue monitoring. Work with caution. Continuous monitoring required. Explosion hazard. Withdraw from area immediately. Note: Combustible gas readings may not be accurate in atmospheres with <19.5% oxygen.
Oxygen	2–5	<19.5% (in occupied work area) 19.5–21.5% >22%	Oxygen deficient. Exit area. Continue work. Exit area, identify source, and contact safety management.
Nuisance dust/ lead-contaminated soil	1, 2, and 4	Total dust action level: appreciable visible dust (1 mg/m^3) for more than 15 minutes	Control dust w/ engineering controls (e.g., water spray). If unable to control dust, consult project manager.

Abbreviations:
LEL = lower explosive limit
mg/m^3 = milligrams per cubic meter

5 WORK ZONE DELINEATION

Personnel will establish three zones at the work site: the support zone, the contaminant reduction zone, and the work zone or "hot" zone.

5.1 SUPPORT ZONE

The support zone will be situated in an upwind area that is free of contamination and will include:

- A storage area for clean safety and work equipment, and
- An area for rest breaks and the consumption of food and beverage, after washing of hands and face.

5.2 CONTAMINANT REDUCTION ZONE

Depending on the specific job task, personnel, sampling equipment, and/or heavy equipment may require decontamination. Sections 5.2.1 through 5.2.3 summarize general decontamination protocols.

5.2.1 PERSONNEL

Use steps and procedures outlined below as guidelines for personnel decontamination:

- Brush loose soil from body,
- Remove boots (where appropriate),
- Remove suit (where appropriate),
- Change outer gloves (if returning to sampling),
- Remove gloves, and
- Field wash hands.

5.2.2 SAMPLES AND SAMPLING EQUIPMENT

Separate decontamination lines will be used for decontamination of sampling equipment and for personnel. At a minimum, the following protocols will be followed for equipment decontamination:

- Hand augers and buckets will be washed in an Alconox and water solution or equivalent and rinsed in distilled water;
- Sampling equipment will be brushed clean and rinsed with distilled water or other appropriate cleaning material; and
- Samples will be dry-wiped prior to packaging.

5.2.3 HEAVY EQUIPMENT AND VEHICLES (AS APPLICABLE)

It is the responsibility of subcontractors to decontaminate heavy equipment in accordance with U.S. Environmental Protection Agency guidance.

WSP or personal/rental vehicles that become contaminated will be cleaned prior to leaving the site. The wheel wells, tires, sides of vehicles, etc. will be broom swept clean of dust and if muddy, undergo high-pressure washing at a location to be determined by the SHSO.

5.3 WORK ZONE (HOT ZONE)

This area is where hazardous chemicals are or may be present. The required job-specific PPE will be worn (Table 8). Any personal or rental vehicles in the work (hot) zone should have floorboards and seats protected by a drop cloth or other easily cleanable surface, and these interior surfaces must be cleaned upon leaving the hot zone.

5.4 DECONTAMINATION WASTES

Spent decontamination solutions will be disposed of in accordance with State of Washington requirements.

Decontamination shall be performed in a manner that minimizes the amount of waste generated.

6 SITE OPERATING PROCEDURES

6.1 INITIAL SITE ENTRY PROCEDURES

Site entry procedures shall be as follows:

- Ensure at least one WSP employee has a cell phone;
- Prior to working on-site, conduct an inspection for physical, chemical, and biological hazards;
- Conduct or review utility clearance prior to start of underground work; and
- Note any specialized protocols particular to work tasks associated with the project.

6.2 DAILY OPERATING PROCEDURES

6.2.1 TAILGATE SAFETY MEETINGS

Tailgate safety meetings must be held daily prior to work start or changes in task or type of activity and documented (**Appendix A**). Meetings must include the following information:

- Review and modify task-specific health and safety analys306is as necessary for all work activities; and
- Establish daily support, contaminant reduction, and work zones, as necessary. Employees will not enter the work zone unless proper PPE is used.

6.2.2 SITE RULES

Worker shall observe the following site rules:

- Employees shall not jeopardize their safety or health for any reason
- Employees will avoid unnecessary contact with contaminated materials. Do not sit down, kneel, or lay equipment on contaminated surfaces.
- Use monitoring instruments and follow designated protocol and contaminant action levels.
- Use PPE as specified.
- The DOSH 8-hour exposure limit for noise is 85 dBA averaged over an 8 hour time period; however, use hearing protection when noise levels exceed the action level of 85 dBA with a noise reduction ratio sufficient to reduce noise levels below the exposure limit. Noise can be estimated using smart phone apps such as the National Institute for Occupational Safety and Health app for Apple phones (www.cdc.gov/niosh/topics/noise/app.html) or other apps for Android phones.
- Remain upwind of operations and airborne contaminants, if possible.
- Establish a work/rest regime appropriate for ambient temperatures.
- Limit personal lifting to 40lbs whenever reasonably possible. For lifting of heavy, awkward, or bulky items, employees shall use mechanical aids or team lifting methods.
- Do not use smoke, chew gum or tobacco, or consume food in contaminated areas.
- Refer to SHSO for specific safety concerns for each individual site task.
- Be alert to your own physical condition.
- **All accidents and near misses, no matter how minor**, must be reported immediately to the SHSO and the Regional Health and Safety Manager.
- Refer to SA306 Employee Field Safety Work Rules for WSP standards for field safety.

6.2.3 INSPECTIONS

WSP personnel will be responsible for the following inspections:

- Daily HSE visual inspections will be conducted by the Field Manager;
- Weekly HSE inspections will be conducted by the SHSO; and
- Monthly inspections will be conducted by the Project Health and Safety Officer and/or the Project Manager.

Weekly and monthly inspections will be documented on the Site Safety and Health checklist (**Appendix A**). Corrective actions will be established for all findings and will be tracked to closure.

If applicable, subcontractors will inspect their equipment (i.e., drill rigs, heavy equipment, tools, etc.) and document the inspection in a log.

6.3 CONFINED SPACE ENTRY PROCEDURES

Site workers shall not enter permit-required confined spaces. Contact the HSE Coordinator.

6.4 BUDDY SYSTEM

Work will be conducted using the buddy system such that a line of sight will be maintained while in the work zone.

6.5 COMMUNICATIONS

Site personnel will carry cell phones. Numbers are listed in the chart below.

Name	Affiliation	Cell Phone
Koorus Tahghighi	WSP	(206) 641-6301
Kyle Hanley	WSP	1 (716) 392-8681
	WSP	
	WSP	

7 SUBCONTRACTORS/THIRD PARTIES/SUPPLIERS – INTERFACE ARRANGEMENTS

WSP will provide oversight and coordinate on-site/field activities to ensure the successful execution of tasks described within this HASP. Each subcontractor is responsible for providing supervision and a safe work place for its employees, as defined by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health (DOSH) in Washington Administrative Code (WAC) Chapter 296-800, and will provide qualified personnel and/or competent persons as, and where, required by law or regulation. Each subcontractor will be responsible for managing and recording any injury or incident involving its employees as required by OSHA, DOSH, or other applicable laws and regulations on their own OSHA 300 forms. WSP will collect and enter subcontractor incidents into the WSP Incident database.

Subcontractors currently known and anticipated to work on the project are in identified in Table 10.

Table 10. Subcontractors

Subcontractor	Contact Information
Subcontractor Name: TBD	Name: Telephone #: Email:
Subcontractor Name:	Name: Telephone #: Email:
Subcontractor Name:	Name: Telephone #: Email:

7.1 COMPLIANCE

Each teaming partner and/or subcontractor is responsible for compliance with applicable federal, state, local, and WSP safety requirements, including but not limited to:

- Completion of their own site-specific HASP;
- Supplying PPE (boots, gloves, etc.) as required by site conditions and DOSH under WAC 296-800-160;
- Complying with WAC 296-155 (DOSH Construction Standards) and WAC 296-24 (DOSH General Safety and Health Standards);
- Providing and enforcing the requirements of individual subcontractor corporate safety programs and procedures as they relate to the project specific work contemplated; and
- Evaluating task-specific AHAs for construction activities performed.

7.2 SUBCONTRACTOR SAFETY RESPONSIBILITIES

Subcontractors will provide company- and site-specific health and safety procedures/safe work plans and AHAs to WSP for inclusion in the HASP, if requested. All subcontractors will be provided with a copy of this HASP and applicable AHAs (developed by either WSP and/or the subcontractor[s]). Subcontractors will develop AHAs for the work they perform and provide them to WSP for concurrence at least one week prior to commencement of site operations. WSP utilizes the U.S. Army Corps of Engineering form EM 385-1-1 f for the AHA. Work shall not begin until the AHA for the work activity has been accepted by WSP and discussed with all engaged in the activity, including WSP, subcontractor(s), and client on-site representatives at preparatory meetings. Subcontractors will review the HASP and AHAs with their employees and supervisors. Each worker is expected to sign the signature sheet, certifying that they understand and will comply with the requirements of this plan.

7.3 REPORTING BY THE SUBCONTRACTORS

Subcontractors will complete the Project Safety Readiness Review Checklist (**Appendix A**) and submit it to the WSP SHSO to document compliance with site HSE requirements.

7.4 EQUIPMENT OPERATORS

Operators of construction equipment shall be qualified by training or experience, meet the requirements of state, provincial, and local laws and regulations, and be authorized by the subcontractor. The subcontractor shall submit copies of certifications of competency to WSP from the employer or third party for equipment requiring

such certificates. Training shall be accomplished on the specific manufacturer and model of equipment to be used.

- The subcontractor shall certify that each operator has been trained and evaluated as required by OSHA, DOSH, or other applicable regulation. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.
- Proof of qualifications shall be kept on the project site for review.

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

8 REQUIRED TRAINING

8.1 HAZARD COMMUNICATION TRAINING

All site personnel (WSP and its subcontractors) shall be advised of the physical and chemical hazards associated with this project prior to commencement of work activities. Safety Data Sheets (SDSs) for chemicals used on site shall be kept on site and available to all workers at all times (**Appendix C**). WSP shall be responsible for acquiring all pertinent SDSs and the SHSO shall be responsible for upkeep of the SDSs at the job site.

8.2 HAZARDOUS WASTE OPERATIONS TRAINING

All site staff will have completed the OSHA 40-hour Hazardous Waste Operations Training, 24-hour on-site supervised training, and appropriate annual updates. In addition, Site Supervisors will have completed the required OSHA 8-hour supervisory training. Personnel trained in first aid and cardiopulmonary resuscitation (CPR) will also have bloodborne pathogen training as mandated by WAC 296-823. Occasional site workers that do not have the potential for exposure to contaminant concentrations exceeding PELs require, at a minimum, 24 hours of OSHA Hazardous Waste Operations Training and one day of on-site training and supervision. Personnel will be required to provide training certificates prior to site entry.

8.3 FIRST AID

The site supervisor or site health and safety officer will be current in CPR and first aid, and will ensure an equivalently trained person is in charge anytime more than one person is working on site. A first aid kit and emergency eyewash with an on-off valve that delivers at least 0.4 gals of water per minute for at least 15 minutes will be available at all times that work is in progress. These will be stored in a field vehicle during upland soil sampling or on board the boat during sediment/surface water/biota sampling. All on-site personnel will be advised of its location.

8.4 ORIENTATION TRAINING AND DAILY SAFETY MEETINGS

An on-site orientation session will be required for all site personnel, including subcontractors, prior to commencement of work and will include the following:

- Site layout;
- Health effects and hazards of the chemicals identified or suspected to be on site;
- Personnel protection, including the use, care, and fitting of PPE and its effectiveness and limitations;

- Decontamination procedures;
- Safe work practices; and
- Emergency procedures, including emergency contacts, instructions for implementing the emergency plan, and the route-to-hospital.

A daily safety meeting will be conducted and documented at the beginning of each workday or work shift. Health and safety considerations for the day's activities will be discussed and protective equipment necessary will be outlined. Problems related to personal protection, inclement weather, or the interpretation of newly available environmental monitoring data will be topics typically covered during these briefings. The Point of Work Risk Assessment form (**Appendix A**) will be used to supplement daily tailgate safety meetings, such when as a new task begins or conditions have changed that introduce new hazards.

8.5 BNSF TRAINING

All staff and subcontractors working within the BNSF right-of-waymust obtain online safety training from BNSF, prior to mobilization. The tracks are active and one or two trains a day use the line. BNSF will provide a flagger until the temporary fencing is established. See the following links for required training: www.BNSFContractor.com. www.everifile.com

9 MEDICAL SURVEILLANCE REQUIREMENTS

Personnel working on site shall participate in a medical surveillance program is consistent with the requirements of WAC 296-843 for hazardous waste site operations. The purpose of the program is to assess and monitor employee health prior to employment, during the course of, and at the termination of employment. Subcontractor employees are required to have been certified by their employer that they are in compliance with this requirement.

Copies of medical clearances and training records shall be made available to, and copies kept by, the SHSO prior to each individual on-site worker beginning site duties. Medical records and exposure records clearance for each on-site worker will be maintained in their individual personnel file at their respective office of employment.

10 SANITATION/ILLUMINATION

Restroom and washing facilities (potable water, soap, and disposable towels) will be available on site for use by field personnel.

Work will only be conducted during daylight hours.

11 SITE EMERGENCY ACTION PLAN

The purpose of this section is to safeguard human health and the environment in the event of an emergency. This section also addresses the emergency actions to be taken in response to an emergency. The responsibility of the regular day-to-day implementation of this information primarily lies with the SHSO. During an actual response situation, the SHSO will serve as the Emergency Coordinator.

11.1 EMERGENCY CONTACTS

A list of contacts and telephone numbers for the applicable local off-site emergency responders is provided in **Table 11**. The nature of the site work and constituents of concern should be reviewed and the ability of off-site

responders to respond to reasonably anticipated emergencies should be confirmed. Contact the off-site responders directly if there are any concerns about their responsibilities.

Table 11. Emergency Contacts

Agency	Telephone Numbers	
Fire Department:	911	
Hospital: Island Hospital, Anacortes	360-299-1300	
Police Department:	911	
TriageNow (early injury case management)	1-877-311-0038	
Name	**Office**	**Cell/Home**
Project Health and Safety Officer: Koorus Tahghighi		206-641-6301
Client Contact: Margo Gillaspy	360-416-1578	360-770-4213
Project Manager: Koorus Tahghighi	NA	206-641-6301
Principal in Charge: Dave Haddock	NA	425-246-7409
E&E HSE Manager: Tré Wilson (See Incident Flow Chart in Appendix D)	~~316-370-9678~~	316-202-9030
Poison Control Center	800-732-6985	NA
Ecology Northwest Regional Office	425-649-7000	NA
Oil Spill Hotline	800-645-7911	NA
Washington Division of Emergency Management	253-512-8031	NA

Abbreviations:
CIH = Certified Industrial Hygienist
HSE = health, safety and environment
NA = not available

11.2 EMERGENCY RESPONSE PROCEDURES

The following are potential emergencies that could occur on the project:

- Chemical spill
- Civil disturbance
- Earthquake
- Explosion
- Fire
- Hurricane
- Medical emergencies
- Severe storm
- Other: seiche (plan route to high ground)

In the event of an on-site emergency, The procedures general emergency procedures are delineated below. Additional specific procedures follow.

- The SHSO (or alternate) should be immediately notified via the on-site communication system. The SHSO will assume control of the emergency response.
- The SHSO will notify the Project Manager and the client contact of the emergency. The SHSO will then contact the Western Group Senior HSE Manager, who will contact the Senior Vice President of HSE.

- If applicable, the SHSO will contact off-site emergency responders (e.g., fire department, hospital, police department) and will inform the response team as to the nature and location of the emergency on site.
- If applicable, the SHSO will evacuate the Site. Site workers should move to the predetermined evacuation point (see Figure 2).
- For small fires, flames should be extinguished using the fire extinguisher, if safe to do so and workers are trained (within the past year). Large fires should be only handled by the local fire department.
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and/or shower (if available).
- If a worker is injured, first aid should be administered by a certified first aid provider.
- An injured worker must be decontaminated appropriately.

After the response, the SHSO will follow up with the required company reporting procedures, including the Incident Analysis Forms (**Appendix D**).

11.2.1 EARTHQUAKE

The following shall be evaluated prior to an earthquake event:

11.2.1.1 Storage

Consider the following when storing materials:

- Large and heavy objects should be stored on lower shelves to prevent them from falling on employees.
- Shelving over 4½ feet in height should be fastened to the wall to prevent tipping over and blocking exits or causing traumatic injuries. Velcro™ restraints for computers and printers have been proven effective at preserving this costly equipment.
- Bottled goods, glass, and chemicals should not be stored in high places or left where they can freely slide on shelves. Chemicals should not be stored near places of potential ignition.
- Restraining hardware and secondary containment are recommended where chemicals are stored on open shelves. Lips can be installed at the edge of open shelving to help prevent items from sliding off. Care must be taken to ensure that incompatible hazardous materials are not stored in close proximity to each other.

11.2.1.2 During an Earthquake

if inside the building, **Drop, Cover, then Hold On**. Drop to your hands and knees. Cover your head and neck with your arms. Crawl only as far as needed to reach cover from falling materials. Hold on to any sturdy furniture until the shaking stops. If outside the building, move away from the structure and utility wires. The greatest danger from falling debris is just outside doorways and close to outer walls. Once in the open, stay there until the shaking stops.

11.2.1.3 After the Earthquake

- Be prepared for additional earthquake shocks (aftershocks). Although most of these are smaller than the main shock, some may be large enough to cause additional damage.
- Check for injuries. Do not attempt to move seriously injured persons unless they are in immediate danger of further injury.
- Listen to the radio (search the web if available) for the latest emergency bulletins and instructions from local authorities.
- Check utilities. If the odor of gas is detected, shut off the main gas valve and, if possible, open windows and exterior doors. Evacuate the facility and report the leakage to the fire department (dial 9-1-1). Do NOT re-enter the building until it is safe to do so. If electrical wiring is shorting out, shut off the current at the main box.

- Check the facility for structural damage and evacuate the facility if significant damage is detected.
- Clean up any spilled hazardous materials such as gasoline, oil, cleaning solvents, etc. in accordance with WSP policies and procedures, environmental regulations, and approved methods.
- Ensure that no one eats or drinks from open containers near shattered glass.
- Contact the fire department or police department only if a life-threatening emergency exists.

After resolution of the immediate emergency or as soon as practicable, the SHSO will notify the Group HSE Manager and complete the appropriate paperwork.

11.2.2 COMMUNICABLE DISEASES

The AHA for communicable disease prevention is provided in **Appendix B**.

11.2.3 MEDICAL INCIDENTS

In the event of any medical incident, immediately notify the WSP SHSO via cellular phone. If an incident requires more than first aid, the WSP SHSO, or designee will determine whether emergency services are needed or whether the employee can be safely transported to a medical service provider. If emergency services are needed, such as a life-threatening emergency, the WSP SHSO or designee shall contact emergency services by calling 911. Support from first aid/CPR/AED-trained site personnel may be provided at this time. Subsequent notifications to Project Management personnel should be made, as described in **Table 11**.

Depending on the type of medical incident, the employee may be transported by on-site first aid trained personnel to one of the facilities listed in Section 11.2.2.3 (for a non-life-threatening emergency) or as directed by the dispatcher/emergency response personnel (for a life-threatening emergency). Minor medical issues may be treated on site. Upon arrival of the appropriate emergency response personnel, field personnel shall defer authority and provide assistance as needed.

11.2.3.1 Medical Care for Non-Life-Threatening Incidents

Examples of medical care for non-life-threatening incidents that may be performed on site include care for minor cuts, minor bruises, minor abrasion, splinters, and insect bites. In case of a non-life-threatening medical incident, medical care may be self-administered or administered on site by a qualified person.

If an injury is not a life-threatening medical emergency, but the injured person(s) needs to seek medical attention, initial care may be administered on site by a qualified person, upon consent. Examples of this include twisted ankles, possible broken bones, and muscle strains. After initial care has been administrated, for WSP employees the WSP SHSO or designee will contact Work Care for instructions on where to transport the injured person. If instructed, the WSP SHSO or designee can transport the injured person to one of the identified clinic or hospitals in the area. For non-WSP employees, follow the injured person's company workplace injury case management program. If the SHSO is unable to transport the injured person themselves, they will call 911.

WorkCare 24/7 Hotline: (844) 268-1852

11.2.3.2 Life-Threatening Medical Emergency

Examples of life-threatening medical emergencies include unconsciousness; difficulty breathing or abnormal breathing; persistent chest pain; severe bleeding that does not stop; chemical or thermal burns; vomiting or passing blood; seizures; possible head, neck, back injuries; poisoning; and compound fractures (i.e., bone sticking through the skin). In case of a life-threatening medical emergency that occurs on site, personnel shall immediately contact emergency services by dialing 911.

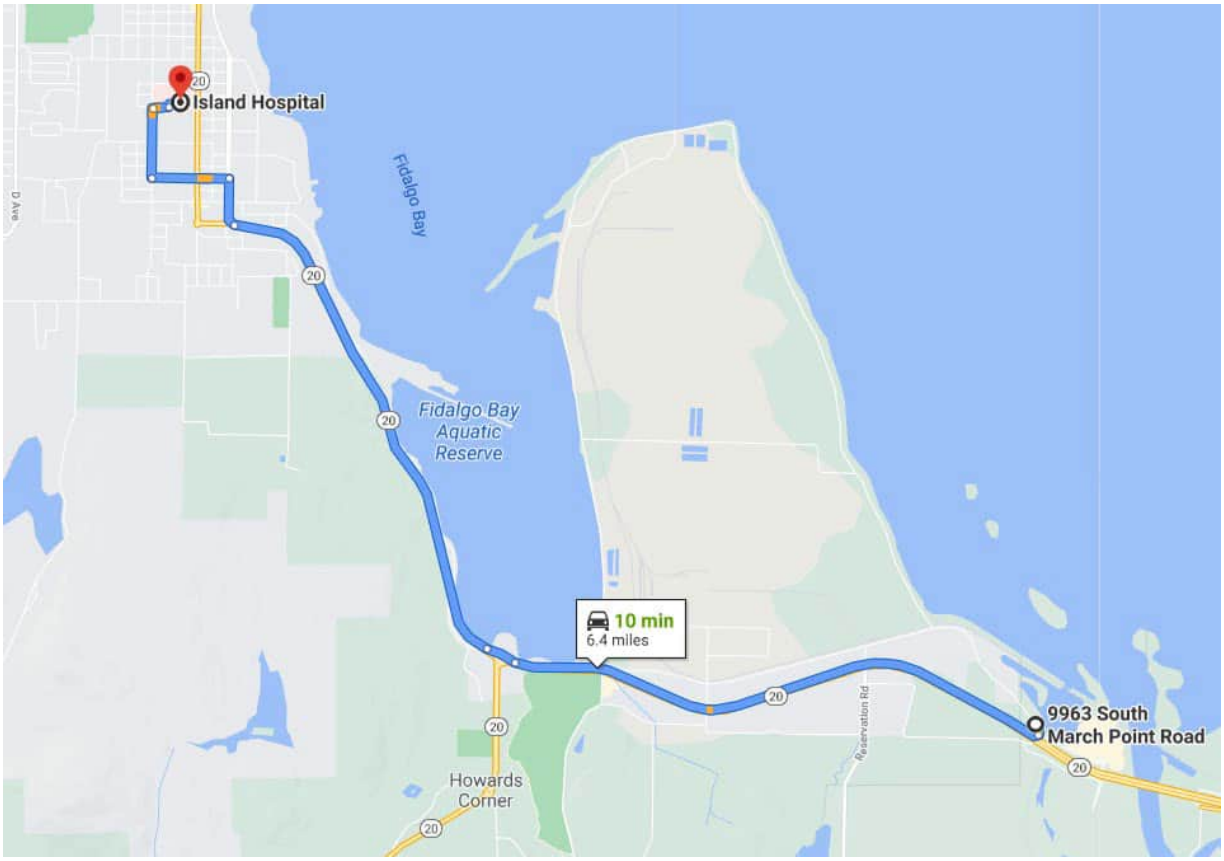
An emergency response transport vehicle or medical evacuation helicopter will be dispatched to the site. Personnel trained in first aid and CPR should assist the injured person until medical professionals arrive on site.

11.2.3.3 Hospitals/Clinics

A nearby hospital (for emergency injuries needing immediate treatment) and a clinic (for non-emergency injuries) have been identified.

The hospital to be used for emergency treatment is **Island Hospital, located at 1211 24th Street, Anacortes, Washington** (see Figure 3 for route to hospital).

Emergency: 911 **Non-Emergency: 360-299-1300**



9963 S March Point Rd
Anacortes, WA 98221, USA

1. Head south-east on S March Point Rd towards Casino Dr — 18 s (285 ft)

Follow WA-20 W and WA-20 Spur W to R Ave in Anacortes — 6 min (5.3 mi)

2. Turn right onto WA-20 W — 2.6 mi
3. Keep right — 0.2 mi
4. Continue straight onto WA-20 Spur W — 2.5 mi

Continue on R Ave to your destination — 4 min (1.1 mi)

5. Turn right onto R Ave — 0.2 mi
6. Turn left onto 32nd St — 0.4 mi
7. Turn right onto M Ave — 0.3 mi
8. Turn right onto 26th St — 410 ft
9. Turn left — 341 ft
   Destination will be on the left

Island Hospital
1211 24th St, Anacortes, WA 98221, United States

Figure 3. Route to Hospital

11.2.3.4 WSP Early Injury Case Management Program

If the emergency involves an injury to a WSP employee, the HSE Coordinator or Site Manager will implement the WSP Early Injury Case Management Program. The procedures are shown in **Table 12**.

Table 12 Emergency Case Management Procedures

Non-Emergency Incident	Emergency incident
Steps 1 & 2 must be completed before seeking medical attention other than local first aid. 1. Provide first aid as necessary. Report the situation to your immediate supervisor and HSE Coordinator (all incidents with the apparent starting event should be reported within 1 hour of occurrence). 2. Injured employee: **Call WorkCare 24/7 Hotline*** **(844) 268-1852**	1. Provide emergency first aid. Supervisor on duty must immediately call 911 or local emergency number; no employee may respond to outside queries without prior authorization. Any outside media calls concerning this incident must be referred immediately to Lauren Gallagher at 602-757-3211. 2. Once medical attention is sought and provided, the supervisor must: **Call WorkCare 24/7 Hotline*** **(844) 268-1852**
WorkCare will assess the situation and determine whether the incident requires further medical attention. During this process, WorkCare will perform the following: • Explain the process to the caller. • Determine the nature of the concern. • Provide appropriate medical advice to the caller. • Determine appropriate path forward with the caller. • Maintain appropriate medical confidentiality. • Help caller to execute path forward, including referral to the appropriate local medical facility. • Send an email notification to the Corporate HSE Department.	WorkCare will be responsible for performing the following: • Contact the treating physician. • Request copies of all medical records from clinic. • Send an email update to the corporate HSE department.
3. IMMEDIATELY after contacting WorkCare, send a brief email notification and inform verbally (direct contact is required) one of the HSE corporate representatives. See Appendix D for the incident flow chart. 4. Make all other local notifications and client notifications. 5. Local Supervisor, HSE Coordinator, SHSO, and any applicable safety committees must complete the preliminary investigation, along with the initial Incident Report entered into iSMS within 24 hours. 6. Corporate Loss Prevention Manager to complete Worker's Compensation Insurance notifications as needed. 7. Corporate HSE to conduct further incident notifications, investigation, include in statistics, classify, and develop lessons-learned materials.	

Note:
1. Step 2 is applicable only to the North American operations and to incidents involving WSP personnel. High-potential near misses, subcontractors' incidents, regulatory inspections, spills, and property damages above $1,000 should be reported immediately, following the directions in Step 3.

Abbreviations:
HSE = health, safety and environment
SHSO = Site Health and Safety Officer

12 RECORDKEEPING

At the end of the project, the following items should be maintained in the project file:

- HASP,
- Incident Analysis/Vehicle Incident Forms/Ground Disturbance Report (if applicable),
- Industrial Hygiene/Air Monitoring information, and
- Log notebooks.

APPENDIX A

FORMS AND CHECKLISTS

Site Safety Orientation Training Form

Project: _____ **Date:** _____

All applicable items listed below are to be reviewed on the first day of site activities and when new workers arrive on site.

Topic to Review:	Covered	N/A
1. Identity of Site Manager and the Site Health and Safety Officer (SHSO)	☐	☐
2. Contents of HASP	☐	☐
3. Review WSP Safety initiatives:	☐	☐
a. Life Saving Actions	☐	☐
b. iSMS Observations	☐	☐
4. Review HSE Objectives and Targets for Project	☐	☐
5. Contents of AHAs applicable to the work being conducted	☐	☐
6. Location of HASP and SDSs on site	☐	☐
7. HAZCOM labeling system if different from local operation	☐	☐
8. Site-specific medical surveillance requirements	☐	☐
9. Safety and health hazards on site	☐	☐
10. Site control measures and safety rules	☐	☐
11. Review monitoring instruments and action limits	☐	☐
12. Verify workers have documentation of training identified in Table 7-1	☐	☐
13. Site Specific/Client Specific training	☐	☐
14. The level of protection and specific PPE to be used	☐	☐
15. Work practices to be used on site to minimize exposure	☐	☐
16. Decontamination procedures	☐	☐
17. How to effectively use site/task engineering controls	☐	☐
18. Emergency communication (signals, codes, posted telephone numbers):	☐	☐
19. Emergency procedures (injuries, fires, hazardous materials incidents, etc.)	☐	☐
20. Location of Rally Point	☐	☐
21. Reporting incidents, near misses and HSE concerns	☐	☐
22. Any other site-specific health and safety-related requirements:	☐	☐

Trainee Name and Signature:

_____ _____

_____ _____

_____ _____

_____ _____

JOB SAFETY & ENVIRONMENT ANALYSIS

Date: **Time:**

Project and No.:

Site:

Supervisor: **Completed by:**

1 STOP

Stop and Assess:	Y	NA
Planning		
PSP/HASP communicated to Employees?	☐	☐
Employees sign review of PSP/HASP? Required	☐	☐
Permits to Work issued?	☐	☐
Preparation		
Employees fit for duty and not showing signs of fatigue?	☐	☐
Work not expected to exceed the fatigue requirements?	☐	☐
Required site inductions completed?	☐	☐
Employees hold the necessary competencies?	☐	☐
Employees have the required PPE?	☐	☐
Plant/equip/tools in good repair (incl. guarding & E stop)?	☐	☐
Site		
Emergency Response Plan in place &communicated?	☐	☐
Service clearance completed?	☐	☐
Current hardcopy digging clearance plans available on site?	☐	☐
Pre-work photographs taken?	☐	☐
Work area adequately delineated / protected?	☐	☐
Traffic control plan implemented (if applicable)? Emergency	☐	☐
and spill response equipment accessible?	☐	☐
Environment & Heritage		
Equipment free of visible weeds and pests?	☐	☐
Waste / substances stored away from sensitive receptors?	☐	☐
Secondary containment for substances / liquid waste?	☐	☐
Erosion and sediment controls installed?	☐	☐
Sensitive receptors protected from damage / disturbance?	☐	☐
Heritage items / artefacts protected from disturbance?	☐	☐
Plant inspected for evidence of fluid leaks & excess exhaust?	☐	☐

Notes:

2 THINK

DISCUSS THE TASK AND THE WORK ENVIRONMENT:

- Weather Forecast
- Site Conditions
- Daily Tasks
- Equipment, Material & Logistical Issues
- Interfacing Works / simultaneous operations

NO JOB IS SO URGENT THAT WE CANNOT MEET OUR HSE RESPONSIBILITIES.

You have the right to refuse, and authority to stop, work if you:

- Believe a HSE risk is not adequately controlled.
- Are unsure of the way to manage risk.
- Do not hold the necessary competency to manage the risk.

3 IDENTIFY

LIFE SAVING ACTIONS -I WILL... Y N



Plant / People Interaction ☐ ☐
- Position myself to be visible to the equipment operator and to avoid interactions with moving equipment.
- Establish and obey signage, pedestrian paths, barriers, and exclusion zones.
- Obtain authorisation from equipment operator prior to entering the zone of influence of mobile plant/equipment.



Driving ☐ ☐
- Only use a vehicle that is fit for purpose and checked prior to driving.
- Drive at a speed appropriate to the conditions and adhering to the road rules.
- Not use personal devices while driving except for hands-free navigation.
- Plan my journey to include regular breaks and fatigue checks.



Suspended Loads ☐ ☐
- Confirm that the equipment and load have been inspected and are fit for purpose
- Establish and obey barriers and exclusion zones
- Observe the instructions given by the banksman / flagman.
- Not place myself under a suspended load.



Lone or Remote Work ☐ ☐
- Carry reliable means of communication for check-ins and emergency calls.
- Establish a communication plan with reporting times and escalation procedure.
- Develop and test an emergency response and rescue plan.
- Have appropriate survival gear and training including first aid.



Working At Heights ☐ ☐
- Implement appropriate fall prevention / protection measures when exposed to a fall risk.
- Establish a rescue plan before commencing work at heights.
- Only work from or operating a mobile elevated work platform (MEWP) if trained, competent and authorised to do so.



Hazardous Substances/Atmospheres ☐ ☐
- Identify and control exposure to hazardous substances / atmospheres before starting work.
- Understand and follow the required procedures for entering a confined/restricted space.
- Test and monitor the atmosphere before entering and during work.
- Establish a rescue plan before entering a confined/restricted space.



Energy Sources ☐ ☐
- Identify all energy sources before work begins.
- Confirm that energy sources have been isolated and zero energy verified prior to undertaking work.
- Locate and control all buried and overhead services before starting work.



Working on/near Water ☐ ☐
- Assess the weather and environmental conditions when working on/around water.
- Not work alone from a vessel or near fast flowing or cold.
- Wear appropriate Personal Flotation Devices where required.
- Establish a rescue plan before working on/near water.



Ground Stability ☐ ☐
- Visually inspect all excavations, ground structures and ground support prior to working.
- Not enter areas of unsupported ground without appropriate ground stability measures in place.
- Place equipment and spoil at a safe distance from excavations.

Are there any other factors (not already covered) that could result in injury, illness, environmental harm, or property damage? ☐ ☐

If yes, record hazard & controls in Section 4

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

4 PLAN – plan what needs to be done to manage the risk

Hazards List any key hazards not in Section 3 or those not identified in the PSP/HASP	Risk Control Measures List the control measures required to eliminate or minimise the risk arising from the identified hazards. If risks cannot be controlled STOP and notify your Project Manager. Update the PSP/HASP if necessary.

Attendee	Signature

Attendee	Signature

Attendee	Signature

5 PROCEED – communicate and implement risk controls

Site Closure Checklist

- Equipment and materials removed or secured? ☐
- Waste collected and removed or securely stored and labelled? ☐
- Site restored to original condition, if required? ☐
- Area free from hazards created by the works? ☐
- Photographs taken of site on completion of works? ☐

Supervisor: **Time:**

Incidents/observations:

Record in iSMS as soon as possible.

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

PROJECT SAFETY READINESS REVIEW CHECKLIST

All information marked "✔" are to be completed by WSP and/or completed/submitted by all subcontractors.

Project Name: _____

WSP Site Manager Name: _____

WSP SHSO Name: _____

WSP E&E Staff (check box to the left if required and box to the right when submitted / done)	Submitted / Done	Date
Check if required:		
☑ Establish Safety Bulletin Board in common area, accessible by all. Post (as applicable):	☐	
☑ Emergency contacts	☐	
☑ Location of hard copy of HASP	☐	
☑ Map to emergency care	☐	
☑ OSHA Poster (US Only)	☐	
☑ Life Saving Actions Poster	☐	
☑ Install first aid kit & fire extinguisher in staff common area	☐	
☑ Provide initial site-specific job hazard training using AHAs.	☐	
☑ Verify employees have the required training (view documents) and that training is current	☐	
☑ Verify current medical monitoring	☐	
☑ Verify employees have PPE, as required in the HASP	☐	
☑ Verify all required air monitoring equipment is available and in good working condition.	☐	
☑ Hold a Pre-Construction Site Meeting with subs	☐	
☑ Hold an initial Mobilization (Kick-Off) Safety Meeting	☐	
☑ Provide WSP Project Safety Orientation training to all WSP employees and subs. Orientation training to include review of E&E HASP, AHAs, Life Saving Rules, etc.	☐	
☑ Establish emergency procedures for the project (e.g., communication methods, rally point, notifications, roles, responses)	☐	
☑ Establish subcontractor HSE interface arrangements (WSP's roles and responsibilities vs. subcontractor's, who conducts orientation training, inspections, meet schedules, etc.)	☐	
☐	☐	
☐	☐	

PROJECT SAFETY READINESS REVIEW CHECKLIST

Subcontractor (Box checked to the left is required. Check the box to the right when submitted / done)			Sub / Done	Date
Project Name:				
Subcontractor Company Name:				
Subcontractor Supervisor Name:		Phone #		
☑ Designate On-Site Safety Representative and OSHA Competent Person(s) (when required by OSHA regulations); provide emergency contact numbers.			☐	
Name of Safety Representative:		Phone #:		
Name of Competent Person:		Phone #:		
Name of Competent Person:		Phone #:		
☑ Subcontractor employees participate in WSP Project Safety Orientation.			☐	
☑ Subcontractor agrees to comply with WSP's HSE standards, procedures, processes and rules for the site.			☐	
☑ Subcontractor submitted relevant Standard Operating Procedures for the work to be conducted at the site (for medium to extreme hazards tasks).			☐	
☑ Subcontractor submitted an Inventory for chemicals brought to the site.			☐	
☑ Subcontractor submitted Safety Data Sheets for chemicals brought to the site.			☐	
☑ Subcontractor submitted initial site-specific Activity Hazard Analysis (AHA). (AHA's will be required to be submitted when a new operation or procedure is initiated.)			☐	
☑ Subcontractor provided initial site-specific Job Hazard Training using AHA's. Obtained signatures at the start of work. Provide periodic refreshers			☐	
☑ Subcontractor provided documentation of required training (e.g., HAZWOPER, HAZCOM, PPE, Fall Protection, Confined Space Entry, Respiratory Protection and fit testing, etc.), as applicable _____			☐	
☑ Subcontractor provided documentation of medical surveillance, if applicable			☐	
☑ Subcontractor verified employees have minimum PPE as identified in HASP and in the AHAs for the work to be conducted (e.g., hard hats, safety glasses, high visibility vests, safety toed boots, gloves).			☐	
☑ Subcontractor posted Project Emergency Procedures and phone numbers in trailers and by telephones.			☐	
☑ Subcontractor conducted and documented equipment inspections, as required by regulation or manufacturers recommendations, and that identified deficiencies are corrected, or the equipment is tagged out of service			☐	
☑ Subcontractor provided ground fault protection for all non-permanent wiring.			☐	

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Completion Checklist:

☐ Collect/review Site data for potential utilities
☐ Public underground utility locates (complete below)
☐ Private underground utility locates (complete below)
☐ Complete Site Plan (proposed boring locations, identified utilities)
☐ Conduct site reconciliation
☐ Deviation approval (as needed) (documented below)
☐ Identify overhead utilities (hazard assessment below)
☐ Communicate Emergency Procedures to onsite workers

Project Information			
Project Name and Number		**Client**	**Site Location**
Project Manager	**Site Supervisor**	**Subcontractor (s)**	**Date(s) of Work**
Description of ground disturbance activities (including who will be conducting the activities (WSP? Sub?))			
Project Manager Notified of any conflicts, changes to boring locations, issues, etc.? Describe			

Emergency Response	
Stop Work and follow the project Emergency Response Plan. -Take measures to protect the health and safety of others. -If risk to life, health, or property, Notify emergency responders and 811 -Notify the Project Manager and facility owner -Do not resume work until authorized -Enter incident in iSMS	**Additional Instructions:**

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Underground Utilities

Public Utility One - Call

Service name/contact info		Notification Made By (Name, Title and Company)		Date & Time of Call/Web Notification
Ticket No.	Legal Dig Date	Ticket Expiration Date		Ticket Renewal Date
Utilities Notified	Responded?	Utilities Present?	Emergency Number	Tolerance Zone Distance/other special instructions (e.g., daylighting required)

Private Utility Locator Information

Locator Company/Contact info	Contracted by	Date of service	Type of locate conducted (EM-Tracing, High-Resolution GPR)
Utilities Identified	Tolerance Zone	Other special instructions (e.g., daylighting required)	

Notes

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Underground Utilities Verification			
Onsite Visual Confirmation of Utilities			
Marking Color	**Utility Type and Potential Visual Clues**	**Cleared/ marked?**	**No markings - comments**
Blue	Potable water: fire hydrant, manholes; water meter, AST, interior connections, hose bib, valve box		
Yellow	Gas, oil steam, petroleum: gas meter, manholes; yellow bollards, interior connections, valve box		
Red	Electric power lines, lighting cables, parking lot lights, overhead lines (telephone poles), conduits: interior connections, underground vaults, manholes, transformers/switchgear, conduit on buildings		
Green	Sewer and drain lines: underground vaults, manholes, drain grates, leach field, sand mound, no evidence of sanitary sewer (for septic system)		
Orange	Communication, alarm or signal lines, cables or conduits: red/orange bollards, telephone poles, interior connections; manholes; conduit on buildings		
Purple	Reclaimed water, irrigation, and slurry lines: sprinkler heads, hose bibs		
Pink	Survey markings		
White/ Black	Proposed locations for excavation and drilling (black can be used for snow conditions)		

Deviation	
If any activities deviate from this procedure, obtain approval from the Project Manager and District Business Leader (or designee) before the work commences. Deviations may include, but not limited to: - When working with subcontractors, the company assumes subcontractor's (or Client's) utility clearance responsibilities established in the agreement -Not conducting public and/or private locates -Not conducting daylighting when required or there are unresolved inconsistencies	**Describe any deviations:**
Deviation Approval:	**Date:**

Verification	
Ground Disturbance Plan verified by:	**Date:**

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Overhead Utilities

Survey your work area and identify any overhead utilities within 20ft (50ft for transmission lines)

Overhead Utilities Identified (type/voltage)	**Location**	**Required clearance distance (varies for type of equipment operated)**	**Controls** (e.g., move/change the activity, isolate, use barrier protection (insulated sleeves), use a competent line spotter/safety watch, have the utility de-energize or move power line, use warning lines with flags/post warning sign, use non-conductive tools)

Notes

Job Hazard Analysis (JHA)

This Job Hazard Analysis (JHA) is to be used with the Field Level Risk Assessment (FLRA)/Job Safety Analysis (JSA) and Project Safety Plan (PSP)

Monitoring

- Employees and subcontractors are required read and sign the JHA to verify they are aware of the necessary controls and responsibilities.
- Conduct a tailgate meeting/toolbox talk to manage situational risk at the beginning of, and or during, each shift.
- Employees to review risk control measures and practice situational awareness.
- Ongoing supervision by Supervisors.
- Senior Site visits conducted by senior leaders.

Review

JHA should be reviewed and updated, in consultation with employees and subcontractors, periodically

- For changes to the tasks, processes, systems of work, plant/equipment, substances, and work conditions that may affect HSE.
- As a result of a workplace incident occurring relating to the current JHA.
- When there is a change in legal or other requirements.

Project Name		**Client Name**	
Project Number		**Completed by**	
Project Location		**Date**	

Supervisors Persons responsible for ensuring compliance with JHA	**NAME**	**POSITION**	**ORGANIZATION**

Task Description	
Adjacent Sites / Ops	

Life Saving Actions		
	☐ Working around heavy and mobile equipment	☐ Working alone or in a remote area
	☐ Driving	☐ Working in areas of ground instability
	☐ Working around suspended loads	☐ Work around energy sources (incl. underground utilities)
	☐ Working in an area with hazardous atmosphere(s) or with hazardous substances	☐ Working at heights
	☐ Working on or near water	

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

Site Emergency	☐ Site emergency procedures available (If emergency procedures area not available or are insufficient, a project specific procedure must be created) ☐ Site owner will provide emergency procedures induction /Site induction Additional Information:

Competency/Training Requirements	COMPETENCY/TRAINING	ROLE / TASKS REQUIRING COMPETENCY
	▪	▪
	▪	▪
	▪	▪

Personal Protective Equipment Provide specifications and/or guidance for use			
	 ☐	 ☐	 ☐
	 ☐	 ☐	 ☐
	 ☐	 ☐	 ☐
	Other		

Associated Procedures			

Permits, Licenses, and Approvals	TYPE	ISSUED BY	ACTIVITY REQUIRING PERMIT, LICENSE, OR APPROVAL

Legal/other Requirements	
Additional Information	

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

Chemicals of Concern		Action Levels	
	▪		▪
	▪		▪
	▪		▪

Hazard Analysis

#	TASK STEPS	HAZARDS	INITIAL RISK			RISK CONTROL MEASURES	CONTROLLED RISK			RESPONSIBILITY
			S	L	RR		S	L	RR	
1.						▪				
2.						▪				
3.						▪				
4.						▪				
5.						▪				
6.						▪				
7.						▪				
8.						▪				
9.						▪				
10.						▪				

S – Severity | L – Likelihood | RR - Risk Rating)
S = (1) No injury/illness (2) Injury/illness first aid only (3) Injury/illness medical treatment (4) Disabling injury (5) Long-term disability or major disabling injury (6) fatal
L = (1) Very remote (2) Remote (3) Possible (4) Probable (5) Likely (6) Almost certain

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

On Site Changes and Review

Use this section to document additional hazards identified on site or during consultation with personnel undertaking the task.

#	TASK STEPS	HAZARDS	INITIAL RISK			RISK CONTROL MEASURES	CONTROLLED RISK			RESPONSIBILITY
			S	L	RR		S	L	RR	
A.						▪				
B.						▪				
C.						▪				

Employees and Subcontractor Acknowledgement

By signing this record, I acknowledge I have I have been provided instruction in these work methods and will comply with the requirements of the JHA.

NAME	ORGANIZATION	SIGNATURE	DATE

Supervisor Acknowledgement

By signing this, I agree with the work methods described herein.

Project Manager / Supervisor		**Signature**		**Date**

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

GENERAL DETAILS

A Journey Management Plan (JMP) is a critical control for your safety and for your team's safety. We strongly recommend that all travelers install and activate the free International SOS Assistance App on their mobile device.

1.0 INSTRUCTIONS

Please provide a copy of this Journey Management Plan to all check-in contacts listed in **Section 7.0**. If appropriate, include as part of the H&S plan.

2.0 TRAVELER DETAILS

Traveler's Name:

Cell/Mobile Number:

Secondary Device (satellite phone, etc.):

3.0 PURPOSE OF TRAVEL

☐ Field Work	☐ Office	☐ Other**:**

4.0 TRAVEL DETAILS (ITINERARY AND ACCOMMODATION) *

Segment (Departure/Arrival/Accommodation)	Travel Dates	Departure/Arrival Times
Additional Details: Exact times dependent on traffic and weather conditions		

* In lieu of completing the table, attach travel provider itinerary

5.0 MODES OF TRANSPORTATION*

☐ Air	☐ Rail	☐ Marine	☐ Fleet Vehicle
☐ Personal Vehicle			
☐ Rental Vehicle	Name:		
☐ Taxi/Shuttle	Name:		
☐ Client Transport	Name of Company & Driver (if known)		

*Identify all modes included in your travel and describe segment of travel (to/from airport, to/from destination country, to/from hotel, to/from site)

6.0 DESTINATION DETAILS

Contact/Client Name	Organisation	Address	Contact Number(s)
N/A			
N/A			

7.0 CHECK-IN CONTACTS/MONITORS

Contacts	Name	Phone/Email	Check-in Arrangement *(e.g. daily, upon arrival, etc. (include approximate time and time zones))*	Phone	Email	Text
Primary (WSP)			Daily, upon departure and arrival	☐	☐	☐
Other (if applicable)				☐	☐	☐

Please confirm with check-in contacts that they are available to fulfill this duty.

CHECK-IN DETAILS

Overdue interval to be agreed upon with Primary Contact: e.g. one hour after agreed upon check-in
Potential barrier(s) to check-in:
e.g. weather delays, travel delays, phone/internet connectivity, time zone, etc.
Plan to mitigate barrier(s):
e.g. travelers will advise primary contact if check-in arrangements change, traveler will ensure roaming is enabled on phone
Missed Check-in Procedure:
e.g. primary contact reaches out to traveler within 1 hr of missed check-in or primary contact reaches out to destination contact

8.0 DRIVING AND JOURNEY MANAGEMENT

If you intend to drive a vehicle on this journey, please complete this section:	
I am aware that I must not use a telephone whilst operating a vehicle, including hands free.	☒
I agree to follow the rules of the road in the country in which I am driving.	☒
I agree to use the safety devices of the vehicle in which I am driving.	☒
I agree to visually check the vehicle prior to use.	☒
I confirm that I am competent to operate a vehicle in the work location (valid license, appropriate driver training etc.)	☒
I confirm that my personal vehicle has the appropriate insurance and breakdown coverage in place.	☒
I confirm that I will review and assess the route prior to travel for additional hazards.	☒
I confirm that I will not operate a vehicle if fatigued (or legislative maximum of work and travel)	☒

9.0 TRAVEL RISK ASSESSMENT (IN ABSENCE OF FULL HSSE PLAN)

High Risk Hazards and Controls:	
Hazard	**Control**
COVID-19 Pandemic	Entry and departure testing arrangements: Entry COVID-19 documents: Vaccination requirements: Entry quarantine requirements: Face covering requirements for travel: Local curfews of destination:
Inclement Weather	*e.g., winter tires, slow driving speed, space between vehicles, emergency supplies*
Wildfires	*e.g., monitor conditions and air quality, PPE, evacuation routes, supplies*
Poor road conditions	*e.g., rough terrain, remote areas, lack of cell phone coverage*
Vehicle malfunction	*e.g., roadside assistance service*
Security threat	*e.g., avoid displaying jewelry or valuables such as laptop computers, do not carry large sums of cash, carry a charged phone and download the ISOS app, don't discuss your travel plans with strangers, confirm security of transport, in country emergency phone number*
Closed or delays at border crossing	*e.g., familiarize yourself with other border crossings in proximity, notify check in contacts of any delays, verify sufficient fuel in vehicle*
Loss of travel documents	*e.g., nearest US Consulate*

10.0 INTERNATIONAL TRAVEL ONLY*

Work in or travel to, or through, location(s)	Location Name	International SOS Travel (Security) Risk Rating	International SOS Medical Risk Rating	
Country:				
City:				
Have you downloaded the iSOS Assistance app to your phone, logged in, and reviewed the app settings? For instructions to download the International SOS Mobile Assistance App, visit International SOS here			Yes ☐	No ☐
Have you recorded relevant medical conditions on your International SOS Emergency Record? This information is available only to International SOS and used in the event of a medical incident while travelling.			Yes ☐	No ☐

Have you completed the iSOS training? (Required for High-Risk Countries) • Introduction to Membership • Travel risk awareness – security • Travel risk awareness - medical • Malaria awareness (if applicable) • Other (as needed)	Yes ☐	No ☐

*If travel requires work in, or travel to or through, High Risk Countries, you **must** be approved for travel. For more information, See WSP's International Travel guidance here.

11.0 EMERGENCY RESPONSE

International SOS can be contacted, at any of the numbers below at any time of day, for medical and / or security assistance and advice during travel. **Our WSP Corporate membership number is 02AABC000037.**

Philadelphia +1.215.942.8226	Singapore +65.6338.7800
London +44.20.8762.8008	Sydney +61.2.9372.2468

E&E Incident flow chart

If there is a life threatening injury, immediately call 911

For non-emergency work related injuries and illnesses such as sprains, strains, minor cuts and abrasions, follow the steps below:

Step 1:	Incident: notify Supervisors / Project Manager / HSE Manager within two hours of incident	Step 4:	Self-care / first-aid or referral
Step 2:	Call WorkCare within one hour of the incident (844) 268-1852 and before receiving any treatment	Step 5:	Recovery and return to work
Step 3:	Receive confidential care guidance from WorkCare	Step 6:	Enter incident into iSMS within 24 hours

WorkCare™
WORK MATTERS. HEALTH COUNTS.
(844) 268-1852

Enter all incidents into iSMS within 24hours

https://zeroharm.wspis.com/fieldforms

Download on the App Store

Get it on Google Play

Safety Manager Name/E-Mail	Earth & Environment Region	Contact Information
Jonathan Olsen jonathan.olsen@wsp.com	E&E USA	(512) 987-6209 (cell)
Greg Ertel gregory.ertel@wsp.com	Applied Solutions, Mining (interim)	(585) 465-0557 (cell)
Don Semon don.semon@wsp.com	Oil & Gas	(718) 496.83.21 (cell)
Kevin Dunsmore kevin.dunsmore@wsp.com	Southeast, Mid-Atlantic, CRS	(856) 373-6576 (cell)
Jeff Tweeddale jeff.tweeddale@wsp.com	Northeast, Midwest	(860) 805-5883 (cell)
Tré Wilson trevon.wilson@wsp.com	Mountain Pacific, California, Texas/Louisiana, Mining (interim)	(316) 202-9030 (cell)
Tom Bemrich Tom.Bemrich@wsp.com	Radiation Safety	(602) 315-2647 (cell)
Zach Manthey Zach.Manthey@wsp.com	Lab Safety	(602) 616-7703 (cell)

Incidents requiring reporting include, but not limited to: injuries, illnesses, near misses, observed hazards, positive observations, workplace violence / harassment, security incidents, subcontractor incidents, regulatory inspections, spills, and property damage.

The Supervisor/PM is responsible for Local/Client Notifications and Drug/Alcohol Testing coordination as per client requirements.

APPENDIX B

ACTIVITY HAZARD ANALYSES

AHA – Field Work General

Activity/Work Task:	**Field Work - General**	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/05/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Tim Reinhardt, CIH Senior Associate				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	H	H	S	S	M
Critical	H	S	S	M	L
Marginal	S	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability"** is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

- **H = High Risk**
- **S = Substantial Risk**
- **M = Moderate Risk**
- **L = Low Risk**

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Check all Life Saving Rules that apply:

	☐ Lone or Remote Work		☐ Ground Stability		☐ Hazardous Atmospheres - Substances		☑ Driving		☐ Energy Sources
			☐ Working Around Water		☑ Plant People Interface		☐ Suspended Loads		☐ Working at Height

AHA – Field Work General

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Mobilization	1A) Vehicular accident	M	Drive safely in accordance with company policies found in SA 209 Vehicle Safety and Incident Reporting. Do not use cell phone or portable electronic devices when driving. Ensure proper maintenance of the vehicle. Complete SA 209-01 Vehicle Safety Checklist. Carry required vehicle safety equipment while on project site.	L
2. Walking and working in the field	2A) Slips/trips/falls	M	Watch your footing. ▪ Site SHSO inspect the entire work area to identify and mark hazards. ▪ Do not talk on cell phone while walking. ▪ Slow down and use extra caution where items are on the ground or there are discontinuities (logs, rocks, and animal holes). ▪ Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. ▪ Wear laced boots with a minimum 8" high upper and non-skid Vibram-type soles for ankle support and traction. ▪ Maintain work areas safe and orderly; unloading areas should be on even terrain; mark or repair possible tripping hazards. ▪ Be aware of work area conditions that can cause slip hazards such as ponding of water on concrete surfaces. Ponding of water on smooth surfaces, such as concrete, coupled with freezing weather conditions has the potential to cause slippery conditions.	L

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2B) Damage to eyes	M	• Protect eyes by wearing safety glasses meeting ANSI Standard Z87 will be worn. ▪ Watch where you walk, especially around trees and brush with limbs sticking out. ▪ Exercise caution when clearing limbs from tree trunks. Use eye protection. ▪ Ultraviolet light from the sun can be damaging to the eyes; look for safety glasses that specify significant protection from UV-A and UV-B radiation.	L
	2C) Bee and wasp stings	M	▪ Inspect ground and vegetation for evidence of bee and wasp activity and avoid those areas if possible. Wear cut-resistant outer gloves, long-sleeve/pants and tuck into boots, and mosquito net if approaching a nest. ▪ Notify SHSO if allergic to stings and carry epinephrine injector as prescribed by a physician.	L
	2D) Ticks and infected mosquitos	M	Keep long sleeves and boots secured at ends and inspect clothing and body after working in tall vegetation. Apply insect repellent as necessary.	L
	2E) Lifting Injuries (e.g., Back Injuries)	S	Lifting Injuries (e.g., Back Injuries) ▪ Site personnel will be instructed on proper lifting techniques. Plan the lift and clear your path, stand close with feet shoulder-width apart, bend at the knees keeping your back straight, lift with the legs and not your back, and hold the load close while avoiding twisting motions. ▪ Perform warm-up excercises before starting work. ▪ Use two people to lift, lower, or carry equipment or materials heavier than 50 pound OR use mechanical devices to reduce manual handling of materials.	M

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2F) Vehicular Traffic and heavy equipment operation – Struck-by/Impaction	S	Struck by vehicle/equipment ▪ Spotters will be used when backing up trucks and heavy equipment and when moving equipment. ▪ Periodically scan for moving equipment. ▪ Back-up alarms must be functional on trucks such that the alarms are heard above ambient noise and at least 10 feet from the vehicle. ▪ Maintain a safe distance while machinery is in operation. Be aware of swing radius, lines under tension, and movement of the equipment. ▪ Drivers will keep workers on foot in their vision at all times, if you lose sight of someone, Stop ▪ Maintain line-of-sight of operators and drivers. ▪ Ground personnel in the vicinity of heavy equipment operations will be within the view of the operator at all times and will wear high visibility vests. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation. ▪ Maintain proper positioning while around heavy equipment in the established exclusion zone. Never walk behind the equipment, or between the equipment and a stationary object.	M
	2G) Overhead Hazards	S	Overhead Hazards ▪ Personnel will be required to wear hard hats that meet ANSI Standard Z89.1. ▪ All ground personnel will stay clear of suspended loads. ▪ All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects. ▪ All overhead hazards will be identified prior to commencing work operations.	M
	2H) Dropped Objects	M	Dropped Objects ▪ Safety-toed boots with CR marking will be worn when handling heavy objects.	L

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Environmental health considerations	3A) Cold Extremes	S	Take precautions to prevent cold stress injuries ▪ Cover all exposed skin and be aware of frostbite. While cold air will not freeze the tissues of the lungs, slow down and use a mask or scarf to minimize the effect of cold air on air passages. ▪ Dress in layers with wicking garments (those that carry moisture away from the body – e.g., cotton) and a weatherproof slicker. A wool outer garment is recommended. ▪ Take layers off as you heat up; put them on as you cool down. ▪ Wear head protection that provides adequate insulation and protects the ears. ▪ Maintain your energy level. Avoid exhaustion and over-exertion which causes sweating, dampens clothing, and accelerates loss of body heat and increases the potential for hypothermia. ▪ Acclimate to the cold climate to minimize discomfort. ▪ Maintain adequate water/fluid intake to avoid dehydration.	M
	3B) Wind	S	▪ Wind chill greatly affects heat loss (see HASP). ▪ Take breaks in accordance HASP.	M
	3C) Thunderstorms	M	▪ Monitor weather channels to determine if electrical storms are forcased. ▪ Plan ahead and identify safe locations to be in the event of a storm. (e.g., sturdy building, vehicle, etc.) ▪ Suspend all field work at the first sound of thurnder. You should be in a safe place when the time between the lightning and thunder is less than 30 seconds. ▪ Only return to work 30 minutes after the after the last strike or sound of thunder	L
	3D) Wildlife	L	Avoid approaching any wildlife observed on site. Do not touch an ill or apparently dead animal.	VL

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
4. Cell phone/electronic device use in the field	4A) Distractions leading to innumerable hazards	M	Designate a safe location/distance away from the work area and traffic patterns for cell phone use. • All phone calls can wait until you have stopped work and moved to a safe location. • Never use a cell phone in an Exclusion Zone unless first moving to a safe location. Use of radios are recommended instead of cell phone use, • Remove chemically protective gloves before cell phone/electronic device handling, • Stand still when using cell phones and electronic devices, • Don't turn your back on traffic or heavy equipment movements, • Operating mobile equipment requires both hands. No cell phone use is allowed while operating mobile equipment including hands free.	L

AHA – Field Work General

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

AHA – Field Work General

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Activity/Work Task:	**Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping**	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025** **Date Accepted:**				
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	X	Plant/People Interface	X	Suspended Loads		Working on or Near Water	X	Ground Stability		Working at Heights
	X	Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Mobilization		M	See General Field Work AHA	L
2. Delivery and Off-loading/Re-loading of Excavator, Grader, Front-end Loader, etc.	2A) Struck by falling materials/equipment due to shifting during transport	S	▪ Prior to excavator delivery, assess area for uneven or soft ground, blind spots, tight quarters, etc. Direct truck driver to best location for off-loading. ▪ Ensure truck & trailer wheels are chocked and parking brakes are set prior to removal. ▪ Establish work zone. Ensure personnel do not enter during excavator off-loading.	M

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Excavator and other Equipment and Truck Operation	3A) Operational Safety	S	▪ Excavator shall be safety inspected before each shift. Inspection must be documented. ▪ Ensure operator is properly trained to operate the excavator or equipment. ▪ Operators and workers shall be familiar with proposed routes. ▪ Operator to familiarize themselves with terrain prior to entering work area. ▪ Ensure a clear path of travel to laydown area (check overhead hazards), discuss operability limits on steep slopes. ▪ Review hand signals with operator and ground crew. ▪ Ground crew will make eye contact with operator prior to approaching excavator. ▪ Ensure that operator will lower bucket when ground crew approaches.	M
	3B) Struck-by	S	▪ All ground personnel shall wear high visibility clothing per HASP ▪ Ground crew will make eye contact with operator prior to approaching equipment or truck and wait for operator to lower elevated components before approaching. ▪ Periodically scan environment to be aware of equipment. ▪ Be positioned to be visible to equipment operators and avoid interactions with moving equipment.	M
	3C) Noise	L	▪ Noise may be monitored using available noise measuring apps on a smartphone. If a normal conversation voice is hard to hear at 3 feet, assume the noise exceeds 85 dBA. ▪ Hearing protection shall be worn when noise levels exceed the OSHA action level of 85 dBA. Hearing protection minimum noise reduction rating (NRR) >25. ▪ Limit time spent near noise producing machines ▪ Increase distance from noise producing machines	L

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	3D) Exposure to soil contaminants/nuisance dust	S	▪ Wet down for dust suppression if visible dust is sustained per action levels in HASP. ▪ Wear safety glasses at all times in the exclusion zone. ▪ Do not eat or smoke within exclusion zone work areas. ▪ Avoid touching face/eyes with gloved hands while in contaminated work areas. ▪ Limit time spent in exclusion zone to time necessary to perofrm work activities. ▪ Follow all assigned personnel decontamination procedures as outlined in HASP (Section 5) and wash hands/face prior to taking breaks, eating, or using the restroom.	L
	3E) Possible slope collapse	S	▪ Keep unnecessary heavy equipment at least three feet away from unfinished cut slope edges. ▪ Keep spoils at least 3 feet from excavation edges ▪ Inspect excavation for cracks in the walls, slumping of soils or other hazards at the start of each shift or after any rain or water intrusion event.	M

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
SITE SUPERVISOR:	_____	SIGNED: _____	DATE: _____

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Sediment Curtain Placement Oversight

Activity/Work Task:	Sediment Curtain Placement Oversight	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	x	Plant/People Interface		Suspended Loads	X	Working on or Near Water	x	Ground Stability		Working at Heights
		Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Sediment Curtain Placement Oversight

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Field Work Over/Near Water	1A) Slips, trips, falls	S	▪ Familiarize self with site prior to visit. ▪ Complete appropriate training before going on site. ▪ Be aware of your surroundings including tide status and weather forecast. ▪ Always watch your footing: Slow down and use extra caution around logs, rocks, and in muddy areas. Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. Wear work boots with a minimum 8" high upper and non-skid soles for ankle support and traction. ▪ Wear mudder overboots when in muddy intertidal areas. Use buddy system and stay within throwable flotation device range when venturing into these areas.	M

AHA – Sediment Curtain Placement Oversight

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	1B) Falling into water	S	▪ Use equipment that facilitates reaching the location from a safe distance (extensions, etc.). Assess safest access route in advance and in current weather and surface conditions. ▪ Whenever work will occur on a boat or within 6 feet of an unguarded edge near the water, a USCG-approved (for commercial use) personal flotation device shall be worn. It must be equipped with a whistle and a water-activated strobe beacon between dusk and dawn. Inspect PFD for defects prior to use. ▪ Work using the buddy system. Additional person within line of sight at all times when working on or adjacent to water. ▪ A throwable 30-inch flotation device with at least 90 feet of retrieval line must be available to the buddy within 75 feet of the operation. ▪ Avoid leaning over gunwales or edge of land to water, maintain three points of contact when at the water's edge or boarding a vessel. ▪ Avoid steep embankments with loose rip-rap. ▪ Be aware of depth, tides, currents, and bottom conditions	M
	1C) Pinch point/struck by	M	▪ Wear cut-resistant gloves. ▪ Do not place any body part between boat gunwale and another vessel, a fixed object or a line that may become taught.	L
	1D) Noise	L	▪ Noise may be monitored using available noise measuring apps on a smartphone. If a normal conversation voice is hard to hear at 3 feet, assume the noise exceeds 85 dBA. ▪ Hearing protection shall be worn when noise levels exceed the OSHA action level of 85 dBA. Hearing protection minimum noise reduction rating (NRR) >25. ▪ Limit time spent near noise producing machines ▪ Increase distance from noise producing machines	L

AHA – Sediment Curtain Placement Oversight

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Sediment Curtain Placement Oversight

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Oversight of Dewatering/Water Treatment

Activity/Work Task:	**Oversight of Dewatering/Water Treatment**		Substantial / High Risks:		Highest RAC: (residual) **L**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Associate				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	H	H	S	S	M
Critical	H	S	S	M	L
Marginal	S	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	x	Plant/People Interface		Suspended Loads		Working on or Near Water		Ground Stability	x	Working at Heights
		Driving	X	Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Oversight of Dewatering/Water Treatment

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
The following PPE are necessary for the decontamination task: • Hard hat* • Safety glasses or goggles* • Face shield • Safety-toed boots* • Gloves (see HASP for type) * • Reflective vests* •	**Competent / Qualified Personnel:** See HASP – Name – Position/Employer **Training Requirements:** Site-Specific HASP Orientation Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Oversee deployment of tankage and hose lays	Strain and crush hazard from lifting and moving heavy items Slip, trip and fall	M	Materials Handling ▪ Use proper lifting techniques. Plan the lift and clear your path, stand close with feet shoulder-width apart, bend at the knees keeping your back straight, lift with the legs and not your back, and hold the load close while avoiding twisting motions. ▪ Use mechanical aids, if available, to move heavy items (over 40 lbs). Slip, trip and fall ▪ Avoid creation of trip hazards, flag hoses in path of travel.	L
2. Oversee pump and discharge operations	High-pressure hose whip strike or spray by wastewater Noise from pump operations. Fire from refueling hot pump.	M	▪ Wear safety glasses and hard hat. ▪ Ensure contractor secures all connections under pressure before charging lines. Use of cam-lock hook-and-loop straps is recommended. ▪ Wait for gas-powered pump to cool before refueling. Have portable ABC-rated fire extinguisher within 75 feet. ▪ **Wear hearing protection (see general field work AHA).**	L

AHA – Oversight of Dewatering/Water Treatment

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Collect water quality samples	Chemical exposure when handling contaminated sample jars and equipment Fall from elevated tank locations.	**M**	Chemical exposure ▪ Wear safety glasses and PPE as outlined in the HASP. ▪ Refer to SDSs (Attachment H) for specific hazards associated with decontamination solutions. Check sample jars for preservative leaks. ▪ Limit exposure (time and distance) to chemicals to required work activities. Fall hazard ▪ **Ensure guardrail is in place on elevated tank perimeter, or use a safely installed and inspected portable ladder.** ▪ Maintain 3 points of contact ▪ Ladder should be insepcted for integrity, clean rungs, and stability prior to use.	**L**
4. Personal Decontamination	Exposure to contaminants	**M**	Exposure to contaminants ▪ Remove gross contamination (e.g., mud) before entering CRZ. ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Respirators will be removed and decontaminated at a specified location within the CRZ by a designated technician, then placed in storage bag. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Limit exposure to hazardous contaminants to required work tasks. ▪ **Decon solutions will be disposed of according to the work plan.**	**L**

AHA – Oversight of Dewatering/Water Treatment

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Oversight of Dewatering/Water Treatment

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Communicable Disease Prevention

Activity/Work Task:	**Communicable Disease Prevention**	Substantial / High Risks:		Highest RAC: (residual)	**L**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Science				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Life Saving Actions	X	Plant/People Interface		Suspended Loads		Working on or Near Water		Ground Stability		Working at Heights
		Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Communicable Disease Prevention

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Cell phone. Running water with handwashing soap and/or hand sanitizer. Disinfecting wipes and cleaners. Refer to Minimum PPE Requirements and specify as per risk assessment where required.	See Emergency Contact List posted on safety boards and/or HASPs for additional contacts if needed. **Training requirements:** • Incident and iSMS reporting • Fit For Duty • Any other trainings required by the site-specific HASP	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Pre-Work Preparation	• Failure to prepare. • Failure to identify or report a hazard and subsequent potential or actual illness and subsequent business continuity impacts. • Unfamiliar with current global/local events and client, WSP and/or government directives. • Not prepared to implement face-covering, spacing or sanitation requirements	M	• Monitor communicable disease-related information issued by local public health or government agency, or HSE Team and follow all directions from medical health officers and local health authority. • WSP team to stay up to date with current WSP directives/procedures. • Ensure workers understand scope of work, hazard and incident reporting process, emergency response procedures and location of emergency response equipment. • Keep workforce briefed on situation daily through tailgates, unscheduled HSE meetings or workplace posters. if needed. • Post signs at entrances stating that workers are not to come to work if feeling unwell or experiencing symptoms of communicable disease • Encourage vaccination and remaining up to date with boosters, and comply with site/client requirements for vaccination, where applicable. • Have adequate supply of face coverings, preferably K95/N95 or a tight fitting covering with a tight weave and minimal gaps between the face and mask. Have a supply of hand sanitizers and cleaning supplies. Be aware of space restrictions and avoid close contact if possible.	L

AHA – Communicable Disease Prevention

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
2. Symptoms Reporting	• Failure to identify or report a hazard and subsequent potential or actual illness and subsequent business continuity impacts.	M	• Everyone should complete a 'self-check' prior to coming to work • Stay home if: - Feeling unwell (e.g., fever, chills, coughing, diarrhea, etc.) - Testing positive for a communicable disease - Directed to isolate or quarantine • If you develop symptoms of a communicable disease, notify your supervisor and follow applicable local jurisdictional and WSP quarantine and self isolation requirements . - Complete required pre-entrance forms, where required.	L
	2B) Damage to eyes	M	• Support employees who are seeking guidance on self-screening to the local public health guidance to self-evaluate: • Canada: **AB**, **BC**, **MB**, **NB**, **NL**, **NWT/NU**, **NS**, **ON**, **PEI**, **QC**, **SK**, **YK** - **US: CDC** COVID-19 Quarantine and Isolation calculator	L
3. Quarantine and Self-Isolation	Failure to isolate and subsequent potential or actual illness and subsequent business continuity impacts.	M	- **Self-Isolate:** Individuals who test positive and/or are symptomatic with COVID -19, must not attend WSP's offices or worksites.	L
	Failure to quarantine and subsequent potential or actual illness and subsequent business continuity impacts.	M	Self-Quarantine: Individuals who are identified as close contacts must follow the jurisdictional quarantine requirements. This may vary according to vaccination status. Where close contacts are not required to quarantine, then WSP requirements recommend testing on day 2 and 5. Individuals who are identified as close contacts must wear a surgical grade mask or above if attending the worksite or office.	L
4. Hygiene Protocols	Failure to apply controls measures and prevent spread of communicable disease due to transfer of infectious material from the hands or other parts of the body (eyes, nose and mouth), or transmission of droplets or airborne routes.	M	• Provide running water with handwashing soap and/or hand sanitizer and encourgage their use through use of signage, reminders in HSE meetings, etc. • Avoid touching face, especially nose, eyes. • Wash hands frequently; before and after eating; after you have been in a public place; after using the washroom; after coughing and sneezing; after touching surfaces that other people also touch - Use a tissue if experiencing runny nose and dispose. Alternatively cough and/or sneeze into the crook of arm.	L

AHA – Communicable Disease Prevention

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
5. Cleaning	Failure to apply controls measures and prevent spread of communicable disease due to transfer via high touch surfaces	M	• Provide disinfecting wipes/cleaners and encourage their use through use of signage, reminders in HSE meetings, etc. - Continue to clean high touch surfaces regularly.	L
6. Ventilation	Failure to apply controls measures and prevent spread of communicable disease due to poor air circulation.	M	- Increase airflow and avoid recircualtion by opening windows, purge indoor areas frequently, and increase air filtration (i.e. buildings, vehicles, site trailers, etc.)	L
7. Physical distancing	Failure to apply control measures and prevent spread of communicable disease due to close contact	M	• Recommend and encourage employees to avoid crowded areas. • Try to maintain 6 feet / 2 meters spacing. Consider installation of barriers if risk level is high or space is limited. - If a crowded area is not avoidable (physical distancing not possible), a face covering is recommended (refer to 'Mask Use').	L
8. Mask Use	Failure to apply control measures and prevent spread of communicable disease due to close contact	M	• Mask use is not required except in accordance with any jurisdictional or site requirements. • Mask use is recommended when in enclosed and crowded spaces. - If a close contact within the last 10 days and past minimum quarantine requirements, wear a surgical grade mask or above.	L
9. Mental Health Stress, Fear, Anxiety	**Unexpected Reactions** • Anger • Violence • Breakdown	M	• Understand that all people are individuals and we all react differently to situations of high stress and change to normal routine in our lives. • Watch out for each other's wellbeing. • Don't be a downer affecting morale - keep a good attitude and stay positive to encourage a positive atmosphere at home and work. • Think before you speak – don't spread false news or gossip; stick to the facts. • If you are feeling stress/anxiety that overwhelms you, seek out assistance (e.g., Employee Assistance Program (EAP)). • Be prepared for an unexpected reaction to a comment or interaction. - Protect yourself and others but be respectful of peoples choices (e.g., to be vaccinated, etc.)	L

AHA – Communicable Disease Prevention

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Communicable Disease Prevention

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Monitoring Well Installation

Activity/Work Task:	**Monitoring Well Installation and Abandonment**	Overall Risk Assessment Code (RAC-Residual) Use highest code:	**M**
Project Location:	**Anacortes, WA**		
Contract Number:	**US0041081.0037-US-Whitmarsh Landfill**		
Date Prepared:	**10/16/2025**		
Date Accepted:			
Prepared by (Name/Title):	**Kyle Hanley, Environmental Scientist**		
Reviewed by (Name/Title):			

Risk Assessment Code (RAC) Matrix

Probability / Severity	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	E	E	E	H	M
Major	E	H	H	M	L
Serious	H	H	M	L	VL
Minor	M	M	L	L	VL
Negligible	L	VL	VL	VL	VL

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:•Establishing site specific measures for the specified activity
•BOLD hazards corresponding to Substantial or High Risk.

Establishing site specific measures for Monitoring Well Installation - this AHA is to be used in conjunction with the Utility Clear and and Drilling Operations and Drilling Oversight AHAs.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Step 1: Review each "Hazard" to identify Probability and Severity (Refer to Risk Register)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Major, Serious, Minor or Negligible

Step 2: Identify the RAC-Inherent as E, H, M, L or VL for each "Hazard" on AHA, **before controls are applied.**

Step 3: Identify the RAC-Residual as E, H, M, L or VL for each "Hazard" on AHA, **after controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

VL = Very Low Risk

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Check all Life Saving Rules that apply:

- ☑ Plant/People Interaction
- ☑ Lone or Remote work
- ☑ Driving
- ☑ Energy Sources
- ☑ Hazardous Substances
- ☐ Suspended Loads
- ☐ Working On or Near Water
- ☑ Ground Stability
- ☐ Working at Height

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Clearing Utilities Prior to Monitoring Well Installation	1A) Utility Strikes can cause physical or environmental hazards.	H	~ Follow the utility clearance procedures in the Utility Clearance AHA and the WSP Overhead and Underground Utilities SA 313 prior to beginning any drilling activities. ~ Provide sufficient time and budget to ensure that utilities have been adequately located, prior to the start of work. ~ Subcontractor to contract Dig Safe / One call Utility identifier organization at least 6 days prior to the project start date ~ Cite or have subcontractor cite a start date of at least 3 working days prior to actual planned start date (provides window to inspect locations prior to job start-up). ~ Document all phone communications with driller about utility clearance issues and requests on the Utility Clearance Form. ~ Call any member utilities that have not responded indicating they have cleared or marked-out utilities and document the phone conversations on the Utility Clearance Form. ~ Walk all planned locations with the subcontractor, prior to start of excavation/drilling to identify marked utilities and note any uncertainties. Field Lead should call PM and relay any issues. Document this inspection in the field book and on the Utility Clearance From. Noe the subcontractor's responses to any WSP concerns. ~ If live utilities are known to be present near drilling location, if possible, move drilling to another location. ~ Use non-destructive means to drill until safe to proceed.	M
2.Subcontractor Drill Rig mobilization and downhole equipment operations and monitoring well construction - with WSP observation and documentation of monitoring well installation and abandonment by the contractor.	2A) Struck by, swing radius, or collision hazards.	H	~ Equipment operated near energized power lines must maintain th appropriate distances as specified by regulations, client requirements, and based on power rating of lines. ~ Operators should be qualified for the equipment in use. ~ Drivers shall conduct a pre-operation equipment safety check. ~ Establish communication protocols with drill crew. ~Be aware of location of stop switches. Verify that all employees know the location of all emergency stop switches, and that the emergency stop switches are active and working properly. ~ Stay clear of drill rig and equipment, but within line-of-sight of drill operator and other crew members. ~ Be attentive during drilling. Personnel should position themselves such that, in the event of equipment failure, they can quickly remove themselves from harm's way. ~ Park company vehicles and unused equipment outside of the work zone. ~ If a skid steer or ancillary equipment is being used to handle cuttings, develop a path for the equipment and keep the path clear of employees and objects. Maintain line of sight for all moving equipment. ~ Do not leave the equipment running while unattended.	M

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2B) Working around heavy machinery	H	~ Maintain a safe distance while machinery is in operation. Be aware of swing radius, lines under tension, and movement of the equipment. ~ Maintain line-of-sight of drill operator and other crew members. ~ Receive affirmative operator approval, and ensure equipment is stationary and not in operation prior to approaching the equipment. ~ Hearing protection may be required if exposed to machinery for extended periods of time. ~ Maintain proper positioning while around the drill rig in the established exclusion zone. Never walk behind the equipment, or between the equipment and a stationary object. ~ Remain alert at all times; listen and identify backup alarms, periodically scan the area for moving equipment	M
	2C) Material under stress and suspended loads can cause crush, energy release, or strike hazards.	H	~ Before use, inspect cable, chain or wire for wear and replace if necessary. ~ Observe OSHA guidelines for use of cable clamps, safety latches, chains and slings. ~ Know rated capacity of chain, cable or wire rope being used and never exceed the rating. ~ Avoid overloading and sudden jerks. ~ Check loads to be lifted for balance and have the rigging inspected to ensure a safe and balanced condition exists. ~ Do not allow employees to stand or work under suspended loads. ~ Awkward loads shall have taglines attached to control the load. ~ Review signals and operator communications with crew. Only one person shall direct the operator.	M
	2D) Moving parts may cause hazards to employees or operators.	H	~Maintain distance from moving parts. ~ If working with tooling is required during downhole operations (handling augers, adding more rods, etc.), verify all parts have come to a stop before handing them. Have the operator keep good communication and line of sight with the crew during any tooling handling operations. ~ Be aware of hand placement and maintain awareness of equipment operations. Only employees or operators should be near the equipment while it is in operation. ~ Avoid loose clothing, jewelry, and hair as they may be caught in moving parts.	M
	2E) Stabilize the equipment with hydraulic jacks/pads to prevent a possible crushing hazard.	M	~ Ensure jack is rated for weight/operation with safe limits. ~ Assure that area is clear of personnel and obstacles. ~ Place pads under jacks to prevent them from sinking into the ground.	L
	2F) Mounting and dismounting the equipment.	M	~When mounting and dismounting equipment, use steps and handhold. Do not jump from vehicle. ~ Use 3 points of contact while mounting or dismounting equipment. ~ Verify that footwear has proper traction and that the equipment is dry when possible.	L

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2G) Sharp edges, tools, or equipment may cause injury.	M	~ Be aware of hand and body placement while the equipment is in operation. ~ Check that tools are sound and only use the proper tool for the job. ~ Wear PPE (scratch and pierce resistant gloves, hard hat, steel toe boots, pants).	L
	2H) Hearing or Eye Damage.	M	~ Maintain a safe working distance from the equipment that is out of reach of potential splash or spray, and to help reduce the decibel level. ~ Wear appropriate PPE (safety glasses or goggles if there is a splash hazard, hearing protection). Multiple types of hearing protection may be necessary depending on the decibel level. ~ Setup away from noisy operations. Don't be near the rig when hammering. Wear hearing protection during drilling activities. ~ Follow procedures outlined in the WSP Hearing Conservation Program (HS-EE-PRO-SA216)	L
3. Handling drill cores, sleeves, and soil bags or cuttings.	3A) Exposure to contaminants	M	~ During drilling operations, always be aware of the possibility of encountering potentially hazardous materials, such as Site-related contaminants in soil or groundwater (herbicides, pesticides, chemical manufacturing by-products or solid waste materials). ~ Perform air monitoring, as outlined in the HASP, to monitor for potential airborne exposures to Site-related contaminants. ~ Wear appropriate PPE (chemical resistant gloves, safety glasses or goggles). ~ Use the proper tools for handing cuttings, or splitting bags, liners, spoons or any other tools use for inspecting the soil core. ~ Apply appropriate labels to any waste storage container.	L
	3B) Lifting may cause back or knee strain. There is an increased risk of slips, trips, and falls while lifting.	M	~ Do not lift objects more than 40lbs alone. If an object is too heavy to lift alone (i.e., drums, materials, tooling, coolers) use equipment, multiple employees, or move in smaller sections. ~ Lift with the legs and not the back. ~ Make sure to keep good housekeeping and to have good footing when living or moving objects. Lines, extension cords, and tools may become trip hazards. ~ Use the appropriate tool for the task to reduce strain. ~ Whenever possible, repetitive tasks should be combined with non-repetitive tasks.	L

AHA – Monitoring Well Installation

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: Minimum PPE Requirements: Safety Glasses, Leather Work Boots with Nonslick Soles and 8-inch ankle support, Long-Sleeve Work Clothes and Pants, Reflective Vest.	**Competent / Qualified Personnel:** Name – Position/Employer Koorus Tahghighi - Assistant Vice President, Civil Engineering/Project Manager/WSP Kyle Hanley - Field Lead/WSP **Training requirements:** List specific certification (as applicable) 40-Hour HAZWOPER Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting	Inspect all PPE prior to use Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service.

AHA – Monitoring Well Installation

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

NAME(S):		SIGNED:		DATE:	
SITE SUPERVISOR:		SIGNED:		DATE:	

Note: For tasks/activities that extend beyond a single day, use attached DAILY RENEWAL form or FLRA.

AHA – Monitoring Well Installation

AHA DAILY RENEWAL

Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

APPENDIX C

SAFETY DATA SHEETS

APPENDIX D

INCIDENT REPORTING

E&E Incident flow chart

If there is a life threatening injury, immediately call 911

For non-emergency work related injuries and illnesses such as sprains, strains, minor cuts and abrasions, follow the steps below:

Step 1:	Incident: notify Supervisors / Project Manager / HSE Manager within two hours of incident	Step 4:	Self-care / first-aid or referral
Step 2:	Call WorkCare within one hour of the incident (844) 268-1852 and before receiving any treatment	Step 5:	Recovery and return to work
Step 3:	Receive confidential care guidance from WorkCare	Step 6:	Enter incident into iSMS within 24 hours

WorkCare™
WORK MATTERS. HEALTH COUNTS.
(844) 268-1852

Enter all incidents into iSMS within 24hours

https://zeroharm.wspis.com/fieldforms

Download on the App Store

Get it on Google Play

Safety Manager Name/E-Mail	Earth & Environment Region	Contact Information
Jonathan Olsen jonathan.olsen@wsp.com	E&E USA	(512) 987-6209 (cell)
Greg Ertel gregory.ertel@wsp.com	Applied Solutions, Mining (interim)	(585) 465-0557 (cell)
Don Semon don.semon@wsp.com	Oil & Gas	(718) 496.83.21 (cell)
Kevin Dunsmore kevin.dunsmore@wsp.com	Southeast, Mid-Atlantic, CRS	(856) 373-6576 (cell)
Jeff Tweeddale jeff.tweeddale@wsp.com	Northeast, Midwest	(860) 805-5883 (cell)
Tré Wilson trevon.wilson@wsp.com	Mountain Pacific, California, Texas/Louisiana, Mining (interim)	(316) 202-9030 (cell)
Tom Bemrich Tom.Bemrich@wsp.com	Radiation Safety	(602) 315-2647 (cell)
Zach Manthey Zach.Manthey@wsp.com	Lab Safety	(602) 616-7703 (cell)

Incidents requiring reporting include, but not limited to: injuries, illnesses, near misses, observed hazards, positive observations, workplace violence / harassment, security incidents, subcontractor incidents, regulatory inspections, spills, and property damage. The Supervisor/PM is responsible for Local/Client Notifications and Drug/Alcohol Testing coordination as per client requirements.

APPENDIX E

INTRODUCTION TO WSP HEALTH, SAFETY AND ENVIRONMENT MANAGEMENT SYSTEMS

1 OVERVIEW OF THE WSP HSE MANAGEMENT SYSTEM

1.1 WSP OVERARCHING REQUIREMENTS

- To be competent, authorised, and physically and mentally fit.
- To conduct a pre-job risk assessment, and establish appropriate mitigating measures.
- To wear suitable PPE.
- To stop work and re-assess the risk before proceeding when there is a change.
- To have a suitable emergency response plan in place.
- To have equipment and tools available, fit for purpose, and in working condition.
- Obligation and authority to stop unsafe work.

1.2 STOP WORK AUTHORITY

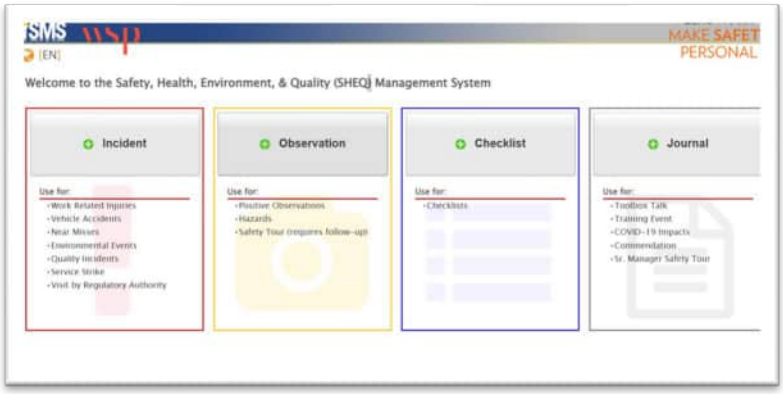
All workers have Stop Work Authority. If work assigned or observed is deemed to be unsafe, they should stop work and notify their supervisor.

1.3 WSP HSE MANAGEMENT SYSTEM MANUAL AND INJURY AND ILLNESS PREVENTION PLAN (IIPP)

The WSP Health, Safety, Security and Environment (HSE) Global Health, Safety, Environment and Quality Management System Manual describes the HSE system and tools developed & implemented at WSP. The manual addresses HSE requirements for offices, laboratories and projects, including those of various duration, scale, location, and jurisdiction. A copy of the HSEQ Manual Manual can be found here: (LINK)

1.4 ISMS

E&I uses WSP's iSMS system to report incidents and observations. iSMS takes the place of CAIRS (Incident Reporting) and HEART (Observation Reporting).



1.5 HSEQ VISION AND VALUES

Our HSEQ Vision and Values are a commitment shared by WSP and all employees to consider and effectively reduce or mitigate health, safety and wellbeing risks from our activities.

Our goal is to ensure that our activities result in:



By Actively Caring for your personal safety, and for those around you, we can prevent accidents and injury.

WSP Nine Life Saving Actions



PLANT/PEOPLE INTERFACE

I will

- Position myself to be visible to the equipment operator and to avoid interactions with moving equipment.
- Establish and obey signage, pedestrian paths, barriers and exclusion zones.
- Obtain authorisation from the equipment operator prior to entering the zone of influence of mobile plant/equipment.



DRIVING

I will

- Only use a vehicle that is fit for purpose and checked prior to use.
- Drive at a speed appropriate to the conditions and adhere to the road rules.
- Not use personal devices while driving except for hands-free navigation.
- Plan my journey to include regular breaks and fatigue checks.



SUSPENDED LOADS

I will

- Confirm that the equipment and load have been inspected and are fit for purpose.
- Establish and obey barriers and exclusion zones.
- Observe the instructions given by the rigger/signaler.
- Not place myself under a suspended load.



HAZARDOUS ATMOSPHERES / SUBSTANCES

I will

- Identify and control exposure to hazardous substances/atmospheres before starting work.
- Understand and follow the required procedures for entering a confined/restricted space.
- Test and monitor the atmosphere before entering and during work.
- Establish a rescue plan before entering a confined/restricted space.



WORKING ON OR NEAR WATER

I will

- Assess the weather and environmental conditions when working on or near water.
- Not work alone from a vessel or near fast-flowing or cold water.
- Wear appropriate Personal Flotation Devices where required.
- Establish a rescue plan before working on or near water.



LONE OR REMOTE WORK

I will

- Carry reliable means of communication for check-ins and emergency calls.
- Establish a communication plan with reporting times and escalation procedures.
- Develop and test an emergency response and rescue plan.
- Have appropriate survival gear and training including first aid.



GROUND STABILITY

I will

- Visually inspect all excavations, ground structures and ground support prior to working.
- Not enter areas of unsupported ground without appropriate ground stability measures in place.
- Place equipment and spoil at a safe distance from excavations.



ENERGY SOURCES

I will

- Identify all energy sources before work begins.
- Confirm that energy sources have been isolated and verify zero energy prior to undertaking work.
- Locate and control all buried and overhead services before starting work.



WORKING AT HEIGHTS

I will

- Implement appropriate fall prevention/protection measures when exposed to a fall from heights.
- Establish a rescue plan before commencing work at heights.
- Only work from or operate a mobile elevated work platform (MEWP) if trained, competent and authorised to do so.

APPENDIX L

CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

FINAL WHITMARSH LANDFILL CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

WHITMARSH LANDFILL REMEDIATION PROJECT, ANACORTES, WASHINGTON
ANACORTES, SKAGIT COUNTY, WASHINGTON, USA
US0041081.0037-US-WHITMARSH LANDFILL

Prepared for:

SKAGIT COUNTY

1800 Continental Pl, Mount Vernon, WA 98273

MARCH 5, 2026

FINAL WHITMARSH LANDFILL CONSTRUCTION QUALITY ASSURANCE PROJECT PLAN

WHITMARSH LANDFILL REMEDIATION PROJECT, ANACORTES, WASHINGTON
ANACORTES, SKAGIT COUNTY, WASHINGTON, USA
US0041081.0037-US-WHITMARSH LANDFILL

Prepared for:

Skagit County
1800 Continental Pl, Mount Vernon, WA 98273

Prepared by:

WSP USA Inc.
18300 Redmond Way, Ste 200
Redmond, WA 98052
USA
T: 425-883-0777

March 5, 2026

TABLE OF CONTENTS

1 Introduction 1
1.1 General 1
1.2 Project Team Organization and Responsibilities 1
2 Construction Quality Assurance 3
2.1 Limits of Excavation 3
2.2 temporary erosion control measures 4
2.3 On-Site Sand Salvage 4
2.4 excvation 4
2.5 Landfill Gas Collection and Venting System 4
2.6 Geosynthetic Clay Liner Installation 5
2.7 Import Material Compliance and Placement 5
2.8 Separation Geotextile 5
2.9 Groundwater Control 6
2.10 Groundwater Treatment 6
2.11 Heron Monitoring 6
2.12 Riparian Mitigation Plantings 7
2.13 Decontamination 7
2.14 Waste Management 7
2.15 Long-Term Monitoring Wells and Probes 7
2.16 Health and Safety 7
3 Project Documentation 8
3.1 Field Notes 8
3.2 Daily Safety Meeting 8
3.3 Meeting Summaries 8
3.4 Daily Activity Log 9
3.5 weekly Activity Log 9
3.6 Force Account Documentation 9
3.7 Photography 9
3.8 Weekly Heronry Monitoring Reports 9
3.9 Sampling and Analysis Tracking 9
3.10 Treated Water Discharge Tracking 10
3.11 Off-Site Waste Disposal Tracking 10
3.12 project change tracking 10
4 References 11

LIST OF FIGURES

Figure 1 Site Vicinity

LIST OF APPENDICES

Appendix A Field Forms

LIST OF ACRONYMS

CM	Construction Manager
County	Skagit County
CQAPP	Construction Quality Assurance Project Plan
Ecology	Washington State Department of Ecology
GCLL	geosynthetic clay Liner with lamination
LFG	Landfill Gas
MTCA	Model Toxics Control Act
QA/QC	Quality Control/Quality Assurance
Strider	Strider Construction Company Inc.
WAC	Washington Administrative Code
WSP	WSP USA Inc.

1 INTRODUCTION

1.1 GENERAL

This Construction Quality Assurance Project Plan (CQAPP) has been prepared by WSP USA Inc. (WSP) on behalf of Skagit County (County) for remedial efforts for the upland properties at the Whitmarsh Landfill Site (Site) at 9663 South March Point Road in Anacortes, Washington (Figure 1). The Site is listed on the Washington State Department of Ecology's (Ecology) Hazardous Sites List as Facility Site Identification (ID) 2662. This CQAPP is part of the Engineering Design Report following the requirements of a Consent Decree 21-2 00194 29 issued by Ecology on March 23, 2021, pursuant to the requirements of the Model Toxics Control Act (MTCA), Revised Code of Washington 70.105D, and its implementing regulations in Chapter 173-340 of the Washington Administrative Code (WAC).

The objective of this plan is to establish the following:

- Project management organization and roles
- The responsibilities and authorities of key personnel
- Quality assurance/quality control (QA/QC) activities, including procedures and methods to check performance and work quality
- Procedures to implement corrective actions if performance standards or design criteria are not met; and
- Documentation procedures and requirements

1.2 PROJECT TEAM ORGANIZATION AND RESPONSIBILITIES

The project team is comprised of four parties with general roles and responsibilities as described below.

Regulator: Ecology's Toxics Cleanup Program, represented by David Horne

Ecology will oversee all aspects of the project to ensure it is aligned with project goals and expectations. The project team will provide weekly progress reports to Ecology. Should any deviation from the project's design and expectations become necessary, it will be presented to Ecology for approval before implementation (except in case of an emergency).

Owner: Skagit County, represented by Margo Gillaspy

Skagit County is responsible for managing the contract, approving and issuing any change orders (such as changes to project costs or schedules), and payments. Skagit County will also need to approve any changes to the project design/implementation, if it deviates from the original design.

Construction Manager/Designer: WSP, represented by Koorus Tahghighi

WSP is responsible for the following: overall construction management (CM); inspecting and verifying all installations; collecting and analyzing all verification and characterization sampling, except as noted for the Contractor; developing changes that require County approval; verifying quantities and invoices; and all project communications and documentation, except as noted for the Contractor.

Project Engineer – Project engineer will serve as the lead in the field for field inspections and addressing questions and changes, and maintain daily and weekly activity logs.

Field Engineer – Field engineer will be responsible to visually verify installations, collect and ship characterization samples, maintain field documentation of the activities, and conduct noise monitoring. The field Engineer will also serve as the site safety officer for the WSP activities.

Archeologist – The project archeologist will be on site whenever excavation to the original shoreline is anticipated along the South March Point Road, and will be responsible to inspect excavated bay mud for the presence of archeological artifacts.

Biologist – The biologist will be on site during the start of each activity to monitor and document the herons' reactions to the construction activities.

Driller – Driller will be responsible to abandon all existing monitoring wells and probes, and install all post construction monitoring wells and probes, as well as developing the monitoring wells.

Contractor: Strider Construction Company, Inc. (Strider)

Strider is responsible for all on-site activities and installations; procuring and placing materials, including all plants and landscaping; characterizing imported Common Borrow; and Site surveying, including the final-record survey of the Site.

Project Director – Project Director will be responsible for the overall project progress, schedule, and cost. Project director will also finalize and sign the project change orders.

Project Manager – Project manager will be responsible for managing the activities and progress on regular basis and identify and resolve issues with the construction management team.

Site Superintendent – Site superintendent will be responsible for the daily activities throughout construction. Site superintendent may also serve as Strider's health and safety officer on site.

Field Surveyor – The Strider surveyor is responsible for all site surveying needs for the project, and preparing the final record drawing for the completed project.

2 CONSTRUCTION QUALITY ASSURANCE

Strider is responsible for all quality control of construction materials and installations, as well as surveying.

The CM team will be responsible for verifying that all activities and installations are in accordance with the project's design (and any agreed-upon changes to the design). The CM team's key tasks are related to the following:

- Limits of excavation
- Temporary erosion control measures
- On-site sand salvage
- Excavation
- Landfill gas collection (LFG) and venting system
- Geosynthetic clay liner installation
- Imported material compliance and placement
- Separation geotextile
- Groundwater control
- Groundwater treatment
- Heron monitoring
- Riparian mitigation plantings
- Decontamination
- Waste Management
- Long term monitoring wells and probes
- Health and safety

The CM team will follow the guidelines in this document and review and implement any relevant documents in the field. These could be the design drawings, project specifications, and other related documents, such as the stormwater pollution prevention plan and treated-water discharge permits. Additional inspections and checks may become necessary to verify overall project installation and compliance.

2.1 LIMITS OF EXCAVATION

The Contractor will use the digital excavation plan and excavators equipped with GPS units to complete excavations to the final grade. Exceptions are the extent of excavation outside the landfill entrance and the bottom of the excavations. The CM team will visually inspect the extent of excavation outside the landfill entrance to verify that all known waste is removed. While the approximate extent is shown on the design drawings, the actual extent will be field-verified.

The bottom of the landfill is the original bay mud from when the waste was placed. The actual depth will be visually verified by the CM team. The vertical extent of excavation may also penetrate the bay mud to remove any visual indicators of potential contamination, such as discoloration. The final depth of the excavation will be documented by the excavator's GPS unit.

Digital data from the excavators will be reviewed daily to verify its accuracy. Initially then periodically, the CM team will utilize their land surveyor to verify the digital information from the excavators. Before proceeding, any discrepancies will be discussed and resolved with the Contractor.

The CM's archaeologist will be present whenever excavation is expected to reach the mudflats along the original shoreline. The approximate location of the areas is shown on the design drawings. The archaeologist will inspect the material at the mudflats for the presence of artifacts. If any artifacts are noted, the area will be cordoned off until activities that are described in the Inadvertent Discovery Plan (Appendix G of the Engineering Design Report) have been implemented. The CM team will notify all appropriate parties noted in the Inadvertent Discovery Plan if artifacts are discovered.

2.2 TEMPORARY EROSION CONTROL MEASURES

Contractor will install and maintain all temporary erosion control measures. They will also provide a certified erosion and sediment control lead (CESCL) for inspections and changes to the temporary erosion control measures. The CM team will verify all installations and changes are in place prior to the start of earthwork in a related section. The CM team will conduct regular inspections, but primarily, the contractor CESCL will conduct inspections once a week and after a storm event to verify the erosion control measures are in good working order, and if not they are maintained, and of deemed appropriate modified to meet the intent, based on project conditions.

2.3 ON-SITE SAND SALVAGE

The existing on-site sand that was placed to cap the landfill during the original landfill closure, will be salvaged and placed over the graded and compacted waste. This material varies in thickness across the Site. The CM team will visually monitor the sand salvage to verify that no appreciable amount of refuse is mixed in.

The Contractor will place markers, such as wooden stakes, to identify the top of the salvaged, placed sand. The CM team will measure the depth of these markers and visually monitor for uniform thickness between markers. Also, the CM team will visually monitor placement and compaction, ensuring that the equipment makes adequate number of passes to achieve a firm layer. Further, the CM team will test the use of a metal rod to evaluate the backfill firmness. The final surface of the placed salvaged, sand will be inspected to verify a smooth surface that does not contain particles greater than 1 inch in diameter or any other debris that may damage the geosynthetic clay liner.

2.4 EXCVATION

Contractor is responsible for all site surveying and excavations and grading to the design limits. Contractor will utilize land surveying and GPS-guided excavator to meet the design grades. The CM team will verify the limits visually and may at times verify by a third-party surveyor. During excavation, any material or object suspected of not meeting solid waste definition will be segregated from the excavated material and set aside for characterization by the CM team. Examples are car batteries and drums with unknown content.

2.5 LANDFILL GAS COLLECTION AND VENTING SYSTEM

The Contractor will likely install LFG piping prior to placing the geosynthetic clay liner with lamination (GCLL), wherever possible. The CM team, along with the Contractor's surveyor, will visually verify the piping's alignment. Subsequently, the CM team will verify the depth of piping embedment and the mechanical connections (nailing) to connect separate pieces of pipe. The CM team will also visually verify the placement and sealing of the GCLL around the vents, to verify it is constructed in accordance with the design drawings.

2.6 GEOSYNTHETIC CLAY LINER INSTALLATION

The CM team will visually verify that the materials received are as specified and that storage and handling are in accordance with the manufacturer's recommendations.

There are two types of GCLL that will be placed on the landfill: regular GCLL and an enhanced version that is tolerant to the saline environment along the slopes. The delineation of elevation at which the switch occurs is shown in the design drawings and will be verified by the Contractor's surveyor and the CM team.

The CM team will work side by side with the installer to verify the subgrade is ready for placement of the GCLL, then subsequently visually verify the following: the lamination is placed facing up; the separate pieces are shingled from the bottom up; the minimum width of overlap is as specified by the manufacturer; and powder bentonite is placed on the overlap sections, before the overlapping piece is placed.

It is critical that the surface area of GCLL placement along the shoreline where it is exposed to tidal action should be small enough to place the GCLL and cover it up with at least the sand drainage layer in a single shift. The CM team, the installer, and the manufacturer will discuss the need for additional materials to be placed. The following day, the CM team and installer will verify that the installed section is acceptable and no undesired hydration has occurred. Any section or pieces of GCLL noted to have excessive hydration will be replaced with new pieces of GCLL.

2.7 IMPORT MATERIAL COMPLIANCE AND PLACEMENT

The CM team will verify that the imported material comes from the approved source by inspecting the weight ticket and visually verifying that the gradation matches the project specifications, (Technical Specifications, WSP 2024). Prior to importing, the Contractor is required to provide analytical test results on the imported Common Borrow to the CM team for approval. The Contractor will also provide the sieve analysis of the different material from the suppliers.

Imported topsoil that is placed on regraded landfill must be obtained from GrowSource and placed on the shoreline areas then higher elevation. If the material from GrowSource is exhausted, then topsoil may be imported from Sunland Bark and Topsoil, to be placed above the shoreline mitigation plantings.

Each layer of the cap system above the GCLL will be placed in one lift and track-compacted. The CM team will consult with the GCLL installer and visually verify the thickness placed, the number of passes of the dozer, the relative density of each layer, and that the dozer does not make sudden starts, stops, or turns, which can damage the underlying GCLL. The initial sand drainage layer must be placed by a low-contact pressure dozer. The CM team will verify each layer is placed and compacted in accordance with the specifications. The Contractor will mark the thickness of each layer, which will then be verified by the CM team during backfilling.

2.8 SEPARATION GEOTEXTILE

The specifications identify only one type of separation geotextile to be used on the project. The CM team will verify that the imported material is as specified and visually verify the placement and overlap, as required. Any changes to the product proposed by the Contractor will require approval by the CM team in consultation with Skagit County prior to import. Depending on the material and the change, Ecology may need to be consulted for approval. The geotextile will be stretched flat on a surface maintaining sufficient overlap and shingled in the uphill direction, the same as the GCLL.

2.9 GROUNDWATER CONTROL

Groundwater control is imperative to project success. The CM team will work with the Contractor to verify collection points, pumps used, and conveyance handling to ensure that there are no leaks into the bay or that newly installed components of the engineered cap do not become contaminated. Groundwater collection will likely require 24/7 operations to capture and maintain the outward flow of groundwater from the working face of the excavation. The CM team will visually monitor this process and, if any issues are noted, a solution will be identified mutually with the Contractor, then implemented and verified for effectiveness.

2.10 GROUNDWATER TREATMENT

The groundwater treatment system will be set up by the Contractor, and the CM team will verify that all components, including the outfall, are installed in the correct sequence and that all chemicals needed for the process are as specified. The CM team is responsible for collecting and analyzing all inline monitoring and confirmation samples, which will be communicated to the overseeing agency to obtain approval to discharge. Per project plans, treated water will be discharged to the surface water, which will require approval to discharge from Ecology's Surface Water group. When earthwork reaches the outfall, and the outfall is removed, it will be discharged to the sanitary sewer, which will require approval from the City of Anacortes Wastewater treatment facility. Additional requirements from the City may need to be completed by the CM team, such as delivering a sample of treated water to the Wastewater Treatment Plant.

Ecology's Water Quality Program will oversee the discharge to surface water. Ecology requires at least two passing results from confirmation tests prior to allowing discharge. The CM team will ensure at least two batches of groundwater are collected and treated while excavating outside the gate at the start of the earthwork. If needed, the system will be modified to achieve the required treatment level. The objective is to verify that the treatment system is operating as intended prior to the start of waste excavation along the railroad tracks.

The analytical testing requirements are specified in the Treatment Engineering Design Report. Any necessary changes to the system will be discussed with WSP's designers and the regulatory agency to obtain approval before proceeding.

2.11 HERON MONITORING

The heronry south of Site will be occupied by herons during their annual breeding season, which typically extends from mid-February to early August. Herons are susceptible to noises and visual changes. The CM team will have a thorough understanding of the project's Heron Management Plan (WSP, 2023) and all its recommendations and requirements and the team is responsible for verifying the implementation of these recommendations and requirements. These will include the noise abatement measures to be implemented by the Contractor.

The CM team will set up a stationary noise monitor next to the heronry to record the noise levels at the point of compliance. The CM team will also and use a handheld noise monitor to measure noise levels on site to verify noise levels are within the established range throughout the breeding season, when work is ongoing. The handheld monitor will be calibrated with the stationary noise monitor initially, then once a week to verify proper readings and function. Further, the CM team's biological monitors will conduct visual inspections of heron activity whenever the Contractor initiates a new task.

2.12 RIPARIAN MITIGATION PLANTINGS

The CM team's landscape architect will be on-site full-time when plantings are being installed. The landscape architect will inspect all plants that are received on-site to verify the plants are in accordance with the plant list on design drawings and planted in accordance with the specifications and design drawings, as well as the Wetland and Buffer Mitigation Plan (WSP 2024). The CM team will also inspect all components of the irrigation system that are brought on-site, as well as their installation. The system will be tested when completed.

2.13 DECONTAMINATION

The CM team will visually verify proper decontamination of construction equipment by the Contractor. The CM team will document the specific equipment decontaminated in the field log book. Decontamination of the treatment system components will be conducted both visually (for full coverage) and via sampling and analytical testing of the final rinsate. If the CM team deems it necessary, wipe samples could be analyzed for key contaminants of concern, such as polychlorinated biphenyls, or as required by the supplier. If any failures are noted, another cleaning and retesting will be required.

2.14 WASTE MANAGEMENT

The project will generate some waste that will require off-site disposal. This could include the following: used personal protective equipment; spent granular activated carbon and sludge from the groundwater treatment system; used sorbent material; and landfill waste that may not classify as solid waste, such as batteries or drums with unknown content. The CM team will ensure this material is segregated and stored on-site separately and collect and analyze characterization samples to determine appropriate off-site disposal. The analyses will be for likely contaminants and as may be required by a receiving facility, such as leachability.

The CM team will visually verify that any packaging and shipment is in accordance with applicable requirements for transport on public roads.

2.15 LONG-TERM MONITORING WELLS AND PROBES

The project requires the installation of long-term groundwater monitoring wells and LFG probes on-site. The design drawings show locations and construction information for these wells and probes. The requirements for installation and waste management are identified in Well Installation Work Plan.

2.16 HEALTH AND SAFETY

The Contractor will hold daily tailgate safety meeting, which will be attended by the CM team. The CM team will also conduct daily morning safety meetings where the activities of the CM team and safety concerns will be discussed in accordance with the WSP project health and safety plan.

The CM team will visually inspect all safety practices of the Contractor to verify compliance with their health and safety plan. The team will also monitor decontamination practices, with particular attention on the potential for cross contamination. The CM team will immediately discuss any identified issues with the Contractor and develop a remedy.

3 PROJECT DOCUMENTATION

The CM team will document the project's progress and overall installation. Project documentation will include the following:

- Field notes
- Daily safety meeting
- Meeting summaries
- Daily activity log
- Force account documentation
- Weekly activity summary log
- Photographic documentation
- Weekly heronry monitoring reports
- Sampling and analysis tracking
- Treated water discharge tracking
- Off-site waste shipment tracking

The project may require additional documentation from the CM team. The daily activity log will be submitted to Skagit County, and the weekly activity summary log will be distributed to all interested parties overseeing the project. Additional documentation will be distributed upon request.

3.1 FIELD NOTES

Each CM team member will have a waterproof field book to document daily work activities. For each day that work is conducted on-site, field notes will identify the date, hours of work, weather conditions, visitors, decisions made, and the equipment and personnel on-site. All notes will be written in indelible ink, and any errors will be crossed once, such that any deleted text remains visible. All field books will be maintained by the CM team in the project files.

3.2 DAILY SAFETY MEETING

The Contractor will maintain all sign-in sheets for daily tailgate safety meetings, and the CM team will maintain the sign-in sheet for WSP's daily safety meeting (in accordance with the project's health and safety plan). During project work, the sign-in sheets will be kept in a folder on-site (to be archived eventually with project closeout files).

3.3 MEETING SUMMARIES

The project team will conduct weekly progress meetings with the Contractor, the County, and other interested parties, such as Ecology. The meetings will include discussion of project status, project changes, the findings of noise and biological monitoring, schedule, and planned activities for the next week. Meeting summaries will be distributed to attendees, and the CM team will maintain digital copies.

3.4 DAILY ACTIVITY LOG

Daily activities will be digitally logged and submitted to the County and any other County-approved interested parties. These daily activity logs will include formal summaries of information documented by the CM team in field notes. An example daily activity log is included in Appendix A.

3.5 WEEKLY ACTIVITY LOG

A weekly activity log will be maintained that will summarize the project activities and progress for the week. This summary will contain the progress and estimated quantities of work completed for the week. An example daily activity log is included in Appendix A.

3.6 FORCE ACCOUNT DOCUMENTATION

The project has several tasks to be completed by the Contractor that will be based on time and materials (force account). For each task, the CM team will monitor the equipment utilized, duration, labor categories, and time. The Contractor will prepare a daily charge sheet and submit it to the CM team for review and approval. The CM team will verify the accuracy of its content, resolve any discrepancies with the Contractor, and submit the final document to the County for approval. The CM team will maintain a copy of the signed document in the field office and return the original to the Contractor. The County may choose to follow a different procedure based on specific circumstances in the field.

3.7 PHOTOGRAPHY

The CM team will sufficiently photograph all phases of project construction. All photographs will be maintained digitally in the field in addition to a log that lists a photograph's number, date, description, and direction of view. The photographs and the photograph log will be digitally included in the final construction report.

3.8 WEEKLY HERONRY MONITORING REPORTS

The Heron Management Plan identifies the project's heronry monitoring requirements and frequency. The CM team will follow these requirements and prepare two weekly heronry monitoring reports: one will be prepared by the field team monitoring noise levels, and the other by the project's biologist monitoring heron behavior during construction. These reports use the example forms in the Heron Management Plan (WSP, 2023) and will be submitted to all interested parties before weekly progress meetings, so the summaries can be discussed during the meetings. The CM team will conduct any necessary follow-up. If any construction changes are deemed necessary, the CM team will work with the Contractor to develop and implement a mitigation measure.

3.9 SAMPLING AND ANALYSIS TRACKING

The CM team will be responsible for planned sampling and analysis during construction. Three categories of samples are planned: operational samples, confirmation samples, and characterization samples.

Operational Samples will be obtained at different stages of water treatment to check on the system. This may include initial influent, and samples before/after the granular activated carbon vessels. The treatment system operator and WSP designers will determine the location and frequency of such samples and evaluate the results.

Confirmation Samples will be obtained from the treatment system to verify the discharge water meets the allowable standard for all constituents. The first two batches of the treated water will be sampled and the reports will be submitted to Ecology's Surface Water group to obtain approval to discharge the treated water. Subsequently, the sampling will be inline grab samples. Laboratory reports will be submitted to Ecology's stormwater group when discharging to surface water, and to the City of Anacortes treatment facility manager when discharging to the sanitary sewer. If any failures are noted, the discharge will stop and the water treated gain and re-sampled. The CM team will review and comply with the Amended Administrative Order and the Sanitary Sewer Discharge Permit for full compliance.

The Contractor will be responsible for collecting and analyzing confirmation samples from equipment decontamination prior to equipment demobilization. The CM team will review the test results and keep digital copies of lab reports.

Characterization Samples will be collected from waste segregated for off-site disposal. The samples will be analyzed for relevant contaminants of concerns, and any additional testing that may be required by the potential receiving facility to allow for waste profiling.

The CM team will prepare a tracking table for all samples and testing and maintain a copy in the field. The final construction report will include all laboratory test reports.

3.10 TREATED WATER DISCHARGE TRACKING

A table will be used to track agency approvals, dates, and quantities of treated water discharged. The final construction report will include this tracking table.

3.11 OFF-SITE WASTE DISPOSAL TRACKING

The CM team will maintain documentation of waste types, estimated quantities, and dates that any waste is shipped for off-site disposal. If any identified hazardous waste requires a shipping manifest, the Contractor will complete the manifest and the CM team will submit it to the County to sign as the waste generator (WSP is not authorized to sign a hazardous waste manifest on behalf of the County). Non-hazardous waste will not require the County's signature for off-site shipment; the Contractor may sign those to satisfy any such requirement from the receiving facility.

Copies of all waste manifests, weight tickets, or both will be kept in files and included in the final construction report.

3.12 PROJECT CHANGE TRACKING

The contractor will maintain the project "redline" drawings, showing actual installation and locations. The CM team will verify the actual installation and maintain a log of changes made to the project design throughout the construction. Depending on the change, the proposed changes will be submitted to Skagit County and Ecology prior to implementation.

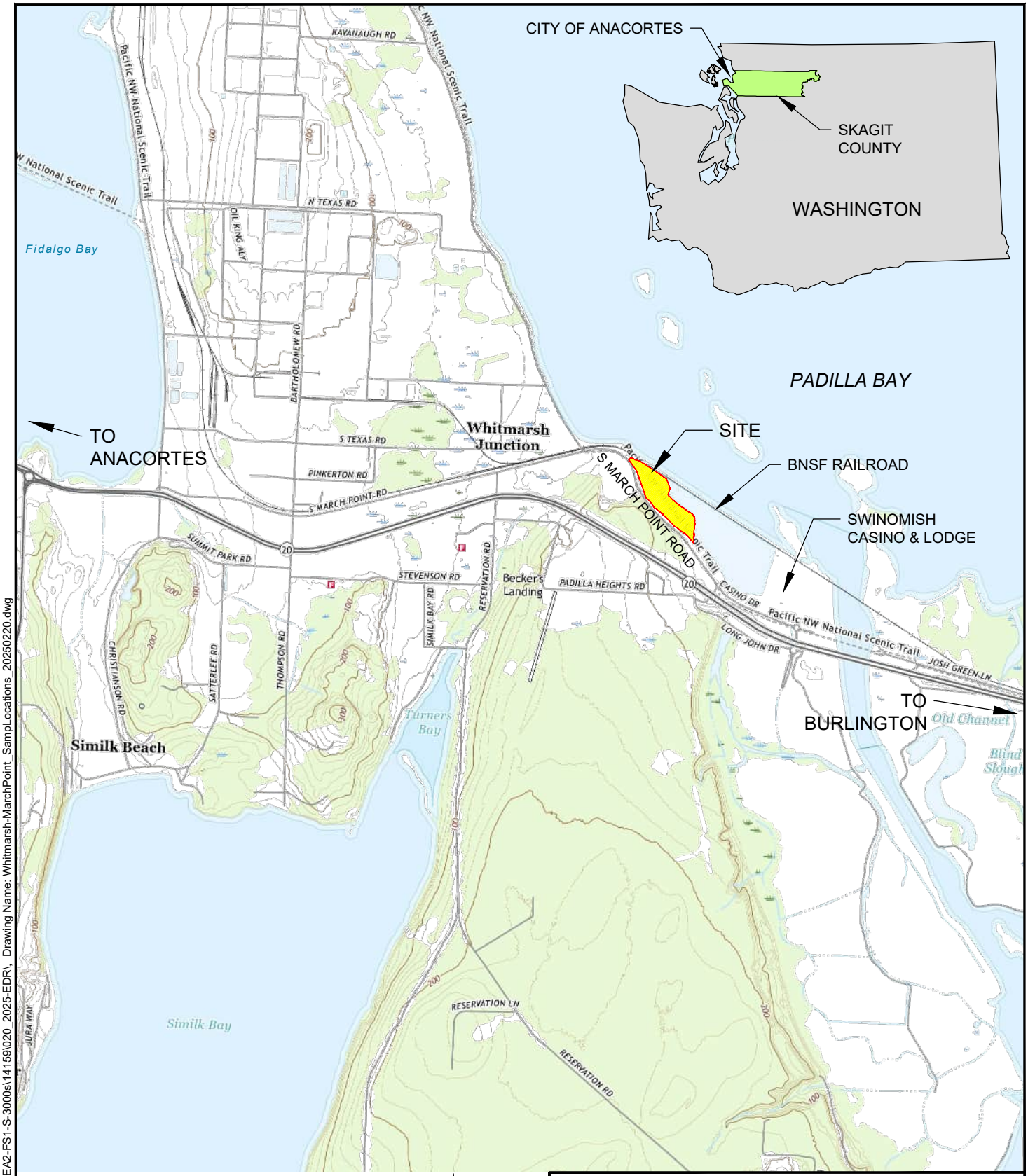
4 REFERENCES

WSP, 2023. Heron Management Plan.

WSP, 2024. Technical Specifications.

WSP, 2024. Wetland and Buffer Mitigation Plan.

FIGURE 1



Base map courtesy USGS, WA_Anacortes_South

0 1/4 1/2

SCALE: 1" = 1/2 MILE

SITE VICINITY
March Point (Whitmarsh) Landfill
Anacortes, Washington

By: APS	Date: 02/20/25	Project No. US0041081.0037
WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052		Figure 1

Plot Date: 02/20/25 - 6:09pm, Plotted by: USAS719374
Drawing Path: X:\US\USXHF100-SEA\SEA2-FS1-S-3000s\14159\020_2025-EDR\, Drawing Name: Whitmarsh-MarchPoint_SampLocations_20250220.dwg

APPENDIX A

FIELD FORMS

WSP USA Inc.

DAILY ACTIVITY LOG

PROJECT NAME **Whitmarsh Landfill Remediation Project**		PROJECT NO. **US0041081.0037**	FIELD REPORT NO.
ADDRESS 9663 South March Point Road		DATE	PAGE
CITY OR COUNTY **Anacortes, WA**	PERMIT NO.	ARRIVAL TIME	DEPARTURE TIME
CLIENT **Skagit County**	WSP PROJECT MANAGER/PHONE NO.		
GENERAL CONTRACTOR	WSP FIELD REPRESENTATIVE/ MOBILE NO.		
SUBCONTRACTOR	WEATHER		
TYPE OF WORK PERFORMED			
EQUIPMENT USED			

COMMENTS

☐ The contents of this field report were discussed with the contractor's on-site representative.

☐ A preliminary copy of this field report was left on site. All recommendations contained herein are subject to change pending review by the Wood project manager.

WSP FIELD REPRESENTATIVE

WSP PROJECT MANAGER

WSP USA Inc.

DAILY ACTIVITY LOG

PROJECT NAME	PROJECT NO.	FIELD REPORT NO.
	US0041081.0037	
ADDRESS	DATE	PAGE

COMMENTS

WSP FIELD REPRESENTATIVE

WSP PROJECT MANAGER

WEEKLY FIELD ACTIVITIES SUMMARY

Week No.: **Dates:** **To:**	**Project No.: US0041081.0037**
Project Name: Whitmarsh Landfill Remediation	**Date:**
Project Location: Anacortes, WA	**Field Representative:**

Prepared by: _____

Reviewed by: _____

APPENDIX M

WELL INSTALLATION WORK PLAN

FINAL MONITORING WELL INSTALLATION WORK PLAN

WHITMARSH LANDFILL
SKAGIT COUNTY, WASHINGTON

WSP PROJECT # US0041081.0037

Prepared for:

Skagit County, Washington

MARCH 5, 2026

FINAL MONITORING WELL INSTALLATION WORK PLAN

WHITMARSH LANDFILL
SKAGIT COUNTY, WASHINGTON

Prepared for:

Skagit County, Washington

Prepared by:

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18300 Redmond Way, Suite 200
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T: (425) 883-0777

WSP PROJECT # US0041081.0037

March 5, 2026

TABLE OF CONTENTS

1 Introduction 1
1.1 Background 1
1.2 Objectives and Scope 1
1.3 Health and Safety 1
2 Field Activities Methods 2
2.1 Site Preparation 2
2.2 Monitoring Well Construction 2
2.2.1 Groundwater Sampling 3
2.3 Landfill Gas Probe Installation 3
2.3.1 Landfill Gas Probe Construction 3
2.3.2 Landfill Gas Monitoring 4
3 Surveying 4
4 Management of Investigation-Derived Waste 4
5 Schedule and Deliverables 4
6 References 4

LIST OF FIGURES

Figure 1 Site Vicinity Map
Figure 2 Proposed Well and Landfill Gas Probe Locations
Figure 3 Proposed Well and Landfill Gas Probe Details

LIST OF TABLES

Table 1 Exploration Points Information

LIST OF APPENDICES

Appendix A Health and Safety Plan
Appendix B Field Forms

LIST OF ACRONYMS

GCLL	Geosynthetic Clay Laminated Liner
HASP	Health and Safety Plan
IDW	investigation-derived waste
LFG	landfill gas
mL	milliliter
POTW	Publicly Owned Treatment Works
PVC	polyvinyl chloride
WAC	Washington Administrative Code
WP	Monitoring Well Installation Work Plan
WSP	WSP USA Inc.

1 INTRODUCTION

WSP USA Inc. (WSP) has prepared this Monitoring Well Installation Work Plan (WP) for Skagit County for the Whitmarsh Landfill, located at 9663 South March Point Road in Anacortes, Washington (Figure 1). This WP describes the process for the construction and development of groundwater monitoring wells and landfill gas (LFG) probes, and sampling. The WP outlines the necessary steps for installation of the monitoring wells and LFG probes, ensuring environmental safety and compliance with regulatory standards. It also details procedures for site preparation, drilling, well development, probe installation, investigation-derived waste (IDW) management, and sampling and monitoring.

1.1 BACKGROUND

The landfill (Site) is an irregularly-shaped parcel consisting of approximately 16.7 acres of fill covering tidelands of the Inner lagoon of Padilla Bay (Bay). The landfill is bounded by South March Point Road to the south and southwest, BNSF railroad right-of-way and tracks to the north, the Bay to the northeast, and the Bay and the Swinomish Indian Reservation to the east.

The landfill developed when waste was illegally dumped onto the Bay mud in 1950s. The Site was later operated by Skagit County as a solid waste landfill. The landfill was closed and capped in 1973. The original Bay mud serves as an aquitard, separating the shallow groundwater from the deep aquifer.

Contaminated seeps in the inner lagoon were noted in early 2000s, and the Site was identified on Washington State Department of Ecology's (Ecology's) Hazardous Waste Site list as Facility ID 2662. Ecology and Skagit County signed a Consent Decree in March 2021 to remediate the Site. The remediation will include regrading the Site to a central mound and capping the mound with a low-permeability, engineered cap. The proposed groundwater monitoring wells and LFG probes will be installed at the end of construction/remediation.

1.2 OBJECTIVES AND SCOPE

The monitoring wells will be used to monitor the following: groundwater levels, the vertical gradient between the shallow and deep aquifers, and water quality in the deep aquifer. The LFG probes will be used to monitor the potential for migration of LFG off-site after Site capping. This WP also serves as the Sampling and Analysis Plan, outlining the procedures for collecting groundwater samples and monitoring of LFG probes.

The scope of work includes the following:

- Installation of six pairs of shallow (above the aquitard) and deep (below the aquitard) monitoring wells on the landfill
- Installation of two shallow monitoring wells outside the landfill entrance
- Installation of three LFG probes off-site
- Survey of the final locations and elevations of the wells and probes and their casings
- Management and disposal of IDW
- Collection of one round of groundwater levels and samples, as well as one set of LFG readings

Approximate locations of the groundwater monitoring wells and LFG probes are shown in Figure 2, and their coordinates and approximate screened intervals are presented in Table 1.

1.3 HEALTH AND SAFETY

The proposed field activities will be conducted in accordance with the construction project's site-specific health and safety plan (HASP) and established procedures, included as Appendix A.

2 FIELD ACTIVITIES METHODS

This section describes methods that will be used for field tasks to be performed during the 2026 field work. Sample forms to be used in the field are included in Appendix B.

2.1 SITE PREPARATION

Prior to the commencement of drilling, the following procedures will be followed for site preparation:

- Identify the locations of the proposed groundwater monitoring wells and LFG probes.
- Call the One-Call center and contract an independent service to locate underground utilities in the vicinity of the exploration locations. It may be necessary to relocate an exploration point based on the outcome of the search for underground obstructions.
- Excavate the low-permeability cap and restore after installation of the wells/probes. Well installations will commence after substantial completion of the cap construction, if possible. The cap removal and restoration will be completed by either the construction contractor or the drilling contractor, depending on schedule and availability.
- Obtain a Right-of-Way Permit from the City of Anacortes for installation of LFG probes to the south of South March Point Road.

All drilling and well installations will be performed by a driller licensed in the State of Washington, in compliance with Washington Administrative Code (WAC) 173-160, Minimum Standards for Construction and Maintenance of Wells. The details of the wells and probes installation and engineered landfill cap restoration are shown in Figure 3.

2.2 MONITORING WELL CONSTRUCTION

Two shallow monitoring wells (26-MW-1S and 26-MW-2S) will be constructed outside the landfill entrance. A total of six pairs of shallow (26-MW-3S through 26-MW-8S) and deep monitoring wells (26-MW-3D through 26-MW-8D) will be installed on the landfill.

Shallow monitoring wells will be drilled using the hollow stem auger technique in the top of the Bay mud. The deep monitoring wells will be drilled using sonic drilling technique to the deep aquifer, through the existing Bay mud.

Shallow wells will be constructed using 4-inch diameter, schedule 80, polyvinyl chloride (PVC) casing to allow their use for potential future groundwater extraction. Deep wells will be constructed using 2-inch diameter, schedule 80, PVC casing. The bottom 5 to 10 feet of the wells will be screened using schedule-80 PVC, Johnson Vee-Wire Screen with a 0.020-inch slots.

The completed cap at the location of the well pairs will be excavated in layers down to the geosynthetic clay liner (GCLL). Excavated material will be stored separately on plastic sheeting for restoration of the cap. The GCLL will be sufficiently removed to allow drilling, and the exposed area covered with plastic sheeting to prevent cross contamination from the drill cuttings. The GCLL repair and seal will be in accordance with the design drawings, as shown in Figure 3. Following completion of GCLL repairs, the excavated cap materials will be restored to the original construction.

The total depth of each borehole will be verified using a weighted measuring tape. A 6-inch-thick base layer of 10/20 silica-sand will be placed at the base of the borehole. The depth of the top of the sand base will be verified using a weighted measuring tape. The well will be assembled within the hollow-stem auger by adding sections to the top of the riser until the screened section is set at the desired depth.

The filter pack (Colorado Silica 10/20) will be placed gradually around the annular space and the depth constantly verified by dropping a weighted tape (2-person activity). The constant raising and lowering of the weighted tape

will ensure no bridging of the filter pack sand occurs. The filter pack sand will extend a minimum of 24 inches above the top of the screen. An annular sealant of hydrated bentonite chips will be placed directly above the filter pack while the augers or casing are removed in 2-foot increments. The bentonite chips will be hydrated with potable water every 2 feet when placed in the unsaturated zone. The bentonite will be placed within the auger as the auger is withdrawn, and the bentonite chips will be extended to 3 inches below the bottom of the GCLL. A cement grout seal will be extended from the top of the bentonite chips to near the surface, where a flush monument will be encased in concrete. A lockable well casing cap will be placed on the casing, inside the monument. Detail 1 on Figure 3 shows the monitoring wells' construction.

Drill cuttings generated will be transferred in bulk to the on-site staging area and will be shipped off-site for disposal. If the work is completed when shipment in bulk is not possible, then the cuttings will be stored in US Department of Transportation-approved, 55-gallon drums, for off-site shipment and disposal.

All drilling equipment will be decontaminated by the driller in between wells and prior to leaving the site with a pressure washer. The decontamination rinsate will be contained by the driller. The monitoring wells will be developed by extracting at least three well volumes or until the water parameters stabilize. The well water and decontamination rinsate will be processed through the on-site water treatment system, if still operational. If the timing does not allow on-site treatment, then the water will be stored in drums and shipped off-site for recycling/disposal at an appropriate facility.

2.2.1 GROUNDWATER SAMPLING

All groundwater monitoring wells will be fitted with a dedicated data logger to record water elevations. All the deep groundwater monitoring wells will have dedicated bladder pumps for sampling. One round of groundwater samples will be collected from the shallow monitoring wells (using a bailer or peristaltic pump) to serve as the baseline of the water chemistry in the shallow water table, after completion of construction. The deep groundwater monitoring wells will be sampled using low-flow sampling techniques to collect samples representative of actual site conditions and to reduce the possibility of mobilizing colloids that are immobile during normal groundwater flow conditions. The sampling protocol will follow the previously approved Uplands Phase II Remedial Investigation Sampling and Analysis Plan (Amec Geomatrix March 2010). An updated sampling and analysis plan and quality control project plan (SAP/QAPP) will be submitted separately, prior to any sampling activities.

2.3 LANDFILL GAS PROBE INSTALLATION

Three LFG probes will be constructed to above the water table. The probe locations are shown in Figure 2 and installation detail is shown as Detail 4 on Figure 3. All drilling and well installations will be performed by a licensed well drilling contractor.

2.3.1 LANDFILL GAS PROBE CONSTRUCTION

The borehole will be advanced to the desired depth using a push probe or hollow-stem auger technique. Before LFG probe installation, the total depth of the borehole will be verified using a weighted measuring tape. A 6-inch-thick base layer of 10/20 silica-sand will be placed at the base of the borehole. The depth of the top of the sand base will be verified using a weighted measuring tape. If push probe technique is used, then pre-pack screen may be installed. The specifics of the LFG probes installation will be determined by driller and the CM team in the field during construction.

The LFG probes will be installed using 1-inch-diameter, schedule 40, PVC casing. The bottom 2 to 5 feet will be screened using 1-inch diameter PVC with a 0.020-inch slot. The screen interval will be determined in the field based on the depth of ground water. The bottom of the screen will be placed approximately 1 foot above the highest anticipated water table, or a depth of seven feet below ground surface, whichever is higher. If groundwater is encountered before reaching the depth of seven below ground surface, enough bentonite chips will be placed in the hole to raise the bottom of the borehole to 1 foot above the groundwater, when using a hollow stem auger technique. When using push probe technique to install the LFG probes, if groundwater is

encountered at a higher elevation, then the hole may be abandoned with bentonite slurry and a new the LFG probe will be installed at a different location nearby. Care will be taken to prevent any materials from entering the well during down-hole assembly. The probes will be fitted with a locking cap to prevent unauthorized access, inside a flush monument. The LFG probes installation and IDW management will be the same as those described for the groundwater monitoring wells.

2.3.2 LANDFILL GAS MONITORING

LFG concentrations will be monitored using an LFG meter, such as a GEM2000 4-gas monitor with optional Gas Pod. The readings will be recorded for comparison with future readings

The LFG probes will be installed offsite to monitor the potential for presence of LFG. Therefore, no actual detections may be made. Following completion of the construction, the LFG probes will be allowed to vent to the atmosphere for at least one hour before a locking cap is placed on the casing. The procedures for landfill gas readings will be included with the long-term monitoring plan, to be updated and submitted at a later date. an operations and maintenance plan will be developed.

3 SURVEYING

The locations of the proposed monitoring wells and gas probes will be surveyed by a land surveyor licensed in the state of Washington. After completion of installations, the surveyor will obtain the exact location and ground surface elevation, as well as top of casing elevation at each location.

4 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Drill cuttings will be transferred to an on-site staging area and shipped off-site in bulk to a permitted solid waste facility. All wastewater generated will be processed through the on-site water treatment system. If the work is completed after remediation contractor demobilization from the site, then all IDW will be stored in 55-gallon drums and staged on-site, characterized, and disposed/recycled off-site at an appropriate, permitted facility.

5 SCHEDULE AND DELIVERABLES

The drilling is planned to be completed in October 2026, while the remediation contractor is on-site to assist with the engineered cap penetrations/restoration and IDW management. The wells and probes installation activities will be summarized in the Final Construction Report. The analytical test results will be submitted separately as the first long-term monitoring report.

6 REFERENCES

Amec Geomatrix, Inc. (Amec Geomatrix), 2010. Uplands Phase II Remedial Investigation Sampling and Analysis Plan, March Point (Whitmarsh) Landfill, Skagit County, Washington, April.

FIGURES



EXPLANATION

- FORMER SNOW MOUNTAIN LOG MILL
- APPROXIMATE EXTENT OF SOLID WASTE
- PARCEL LINES FROM SKAGIT COUNTY

N

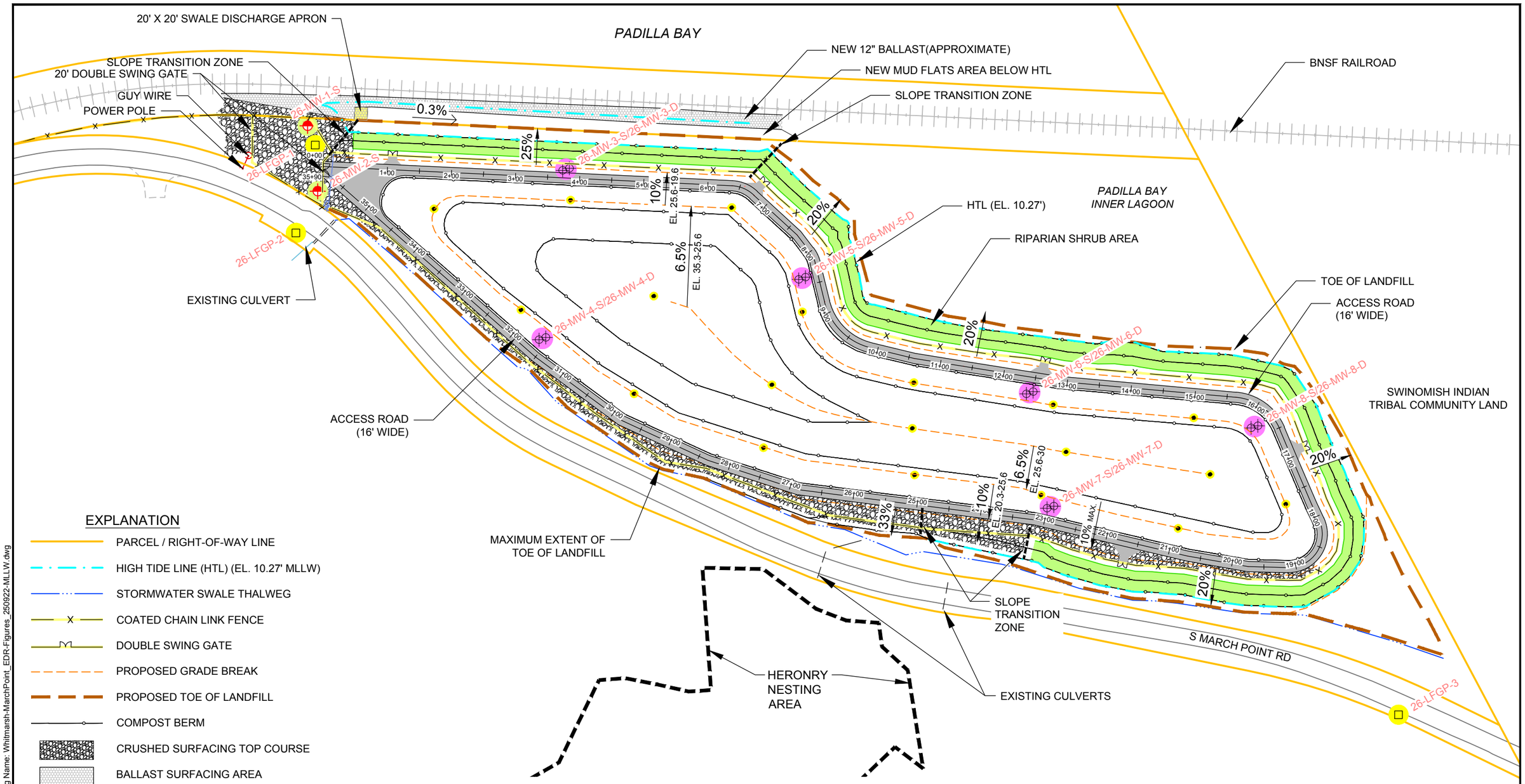
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APPROXIMATE SCALE IN FEET

SKAGIT COUNTY WASHINGTON — Serving With Pride

CLIENT	SKAGIT COUNTY
	WSP USA Inc. 18300 Redmond Way, Suite 200 Redmond, Washington 98052
PROJECT	MARCH POINT (WHITMARSH) LANDFILL Anacortes, Washington
TITLE	SITE VICINITY MAP
DATE	OCTOBER 2025
SCALE	AS SHOWN
PROJECT NO.	US0041081.0037
FIGURE	1

Plot Date: 10/10/25 - 12:25pm, Plotted by: USAS719374
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EXPLANATION

- PARCEL / RIGHT-OF-WAY LINE
- HIGH TIDE LINE (HTL) (EL. 10.27' MLLW)
- STORMWATER SWALE THALWEG
- COATED CHAIN LINK FENCE
- DOUBLE SWING GATE
- PROPOSED GRADE BREAK
- PROPOSED TOE OF LANDFILL
- COMPOST BERM
- CRUSHED SURFACING TOP COURSE
- BALLAST SURFACING AREA
- RIPARIAN SHRUB AREA
- PROPOSED PASSIVE LANDFILL GAS VENT LOCATION (SEE DETAIL 3 FIGURE 3)
- PROPOSED GROUNDWATER MONITORING WELL CLUSTER LOCATION (SEE DETAIL 1 FIGURE 3)
- PROPOSED SHALLOW GROUNDWATER MONITORING WELL LOCATION (SEE DETAIL 1 FIGURE 3)
- PROPOSED LANDFILL GAS PROBE LOCATION (SEE DETAIL 4 FIGURE 3)

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APPROXIMATE SCALE IN FEET

CLIENT
SKAGIT COUNTY

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

PROJECT
MARCH POINT (WHITMARSH) LANDFILL
Anacortes, Washington

TITLE
PROPOSED WELL AND LANDFILL GAS PROBE LOCATIONS

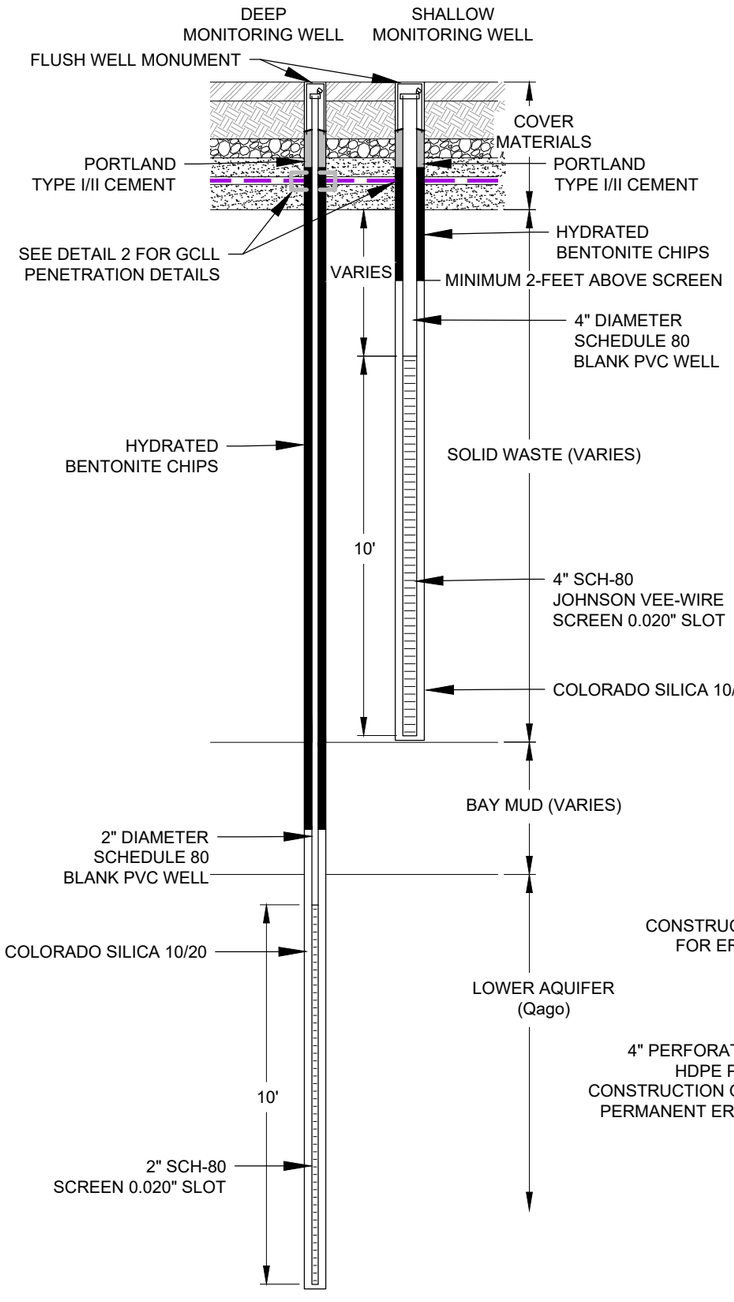
DATE
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SCALE
AS SHOWN

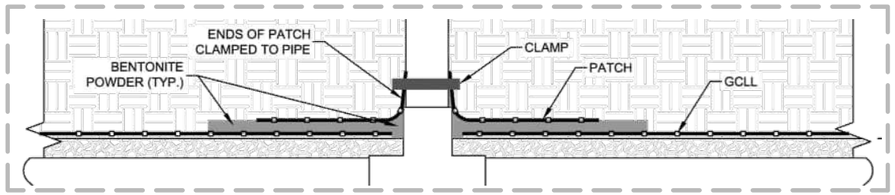
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FIGURE
2

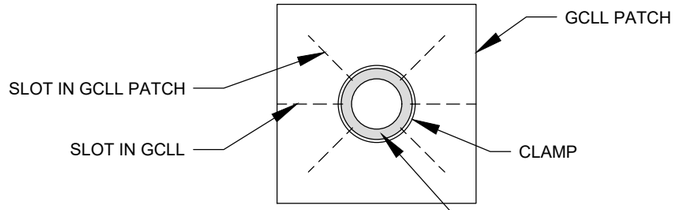
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1 GROUNDWATER MONITORING WELL PAIR
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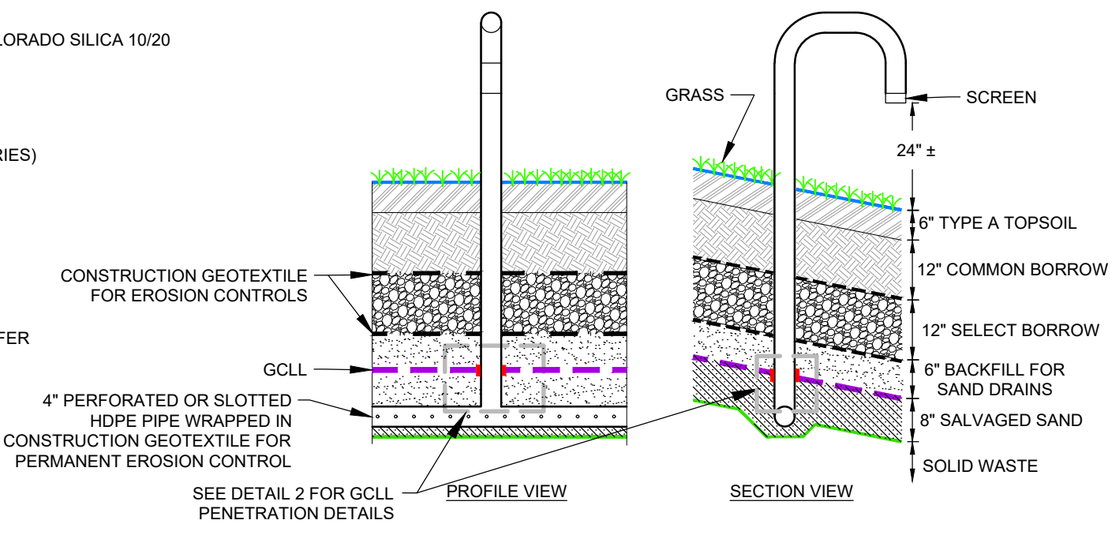


PATCH PROFILE VIEW

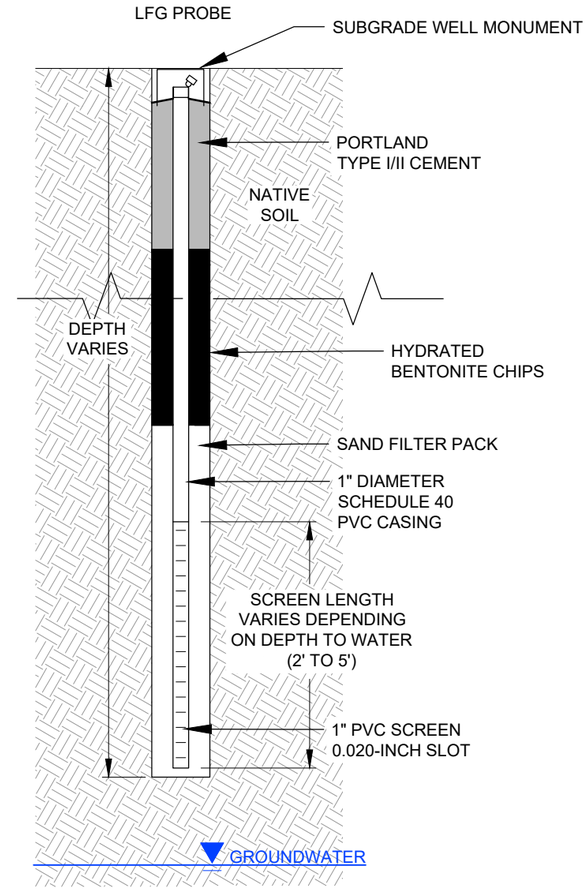


TOP VIEW

2 GCLL PENETRATION DETAIL
NOT TO SCALE



3 PASSIVE LANDFILL GAS VENT DETAIL
(BY THE CONTRACTOR) NOT TO SCALE



4 LFG PROBE DETAIL
(BY THE ENGINEER) NOT TO SCALE

CLIENT
SKAGIT COUNTY

WSP USA Inc.
18300 Redmond Way, Suite 200
Redmond, Washington 98052

PROJECT
MARCH POINT (WHITMARSH) LANDFILL
Anacortes, Washington

TITLE
PROPOSED WELL AND LANDFILL GAS PROBE DETAILS

DATE
OCTOBER 2025

SCALE
AS SHOWN

PROJECT NO.
US0041081.0037

FIGURE
3

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TABLES

Table 1 - Exploration Points Information

Whitmarsh Landfill
Anacortes, Washington

Location ID	Easting	Northing	Longitude	Latitude	Existing Ground Surface Elevation (ft)	Final Ground Surface Elevation (ft)	Proposed Well Depth (ft)	Proposed Screen Interval Depth (ft)
GW-MW-1-S	1228194.51	539023.17	W122° 31' 57.19"	N48° 27' 54.73"	21.37	20.66	14	4-14
GW-MW-2-S	1228156.98	538926.95	W122° 31' 57.72"	N48° 27' 53.77"	21.96	20.92	14	4-14
26-MW-3-S/ 26-MW-3-D[1]	1228509.26	538763.33	W122° 31' 52.44"	N48° 27' 52.24"	24.17	20.58	S: 15 D: 41	S: 5-15 D: 31-41
26-MW-4-S/ 26-MW-4-D[1]	1228345.50	538553.21	W122° 31' 54.80"	N48° 27' 50.13"	22.68	23.97	S: 16 D: 46	S: 6-16 D: 36-46
26-MW-5-S/ 26-MW-5-D[1]	1228743.07	538432.23	W122° 31' 48.86"	N48° 27' 49.02"	19.32	24.41	S: 20 D: 50	S: 10-20 D: 40-50
26-MW-6-S/ 26-MW-6-D[1]	1228960.91	538100.27	W122° 31' 45.52"	N48° 27' 45.79"	16.48	24.46	S: 23 D: 53	S: 13-23 D: 43-53
26-MW-7-S/ 26-MW-7-D[1]	1228899.65	537929.66	W122° 31' 46.38"	N48° 27' 44.10"	17	24.08	S: 22 D: 52	S: 12-22 D: 42-52
26-MW-8-S/ 26-MW-8-D[1]	1229237.83	537879.10	W122° 31' 41.34"	N48° 27' 43.67"	17.78	24.58	S: 22 D: 52	S: 12-22 D: 42-52
26-LFGP-1	1228189.78	538991.19	W122° 31' 57.25"	N48° 27' 54.41"	21.15	20.81	7	2-7
26-LFGP-2	1228095.22	538887.67	W122° 31' 58.62"	N48° 27' 53.37"	21.38	21.38	7	2-7
26-LFGP-3	1229206.92	537376.80	W122° 31' 41.64"	N48° 27' 38.71"	19.98	19.98	7	2-7

Notes:

1. Wells are paired to be installed 3 feet apart. Final location of each well will be surveyed.
2. Elevations are in Mean Lower Low Water (MLLW) datum.

Key: D = deep; FG = finished grade; ft = feet; ID = identifier; LFGP = landfill gas probe; MLLW = mean lower low water; S = shallow

APPENDIX A

HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

MARCH POINT (WHITMARSH) LANDFILL
9663 SOUTH MARCH POINT ROAD,
ANACORTES, WASHINGTON
PROJECT US0041081.0037

Prepared by:

WSP USA Inc.
18300 Redmond Way, Ste 200
Redmond, WA 98052
USA

February 23, 2026

SITE-SPECIFIC HEALTH AND SAFETY PLAN

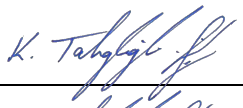
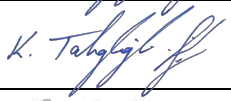
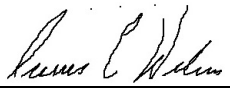
Project Name: March Point (Whitmarsh) Landfill

Project Location: 9663 South March Point Road, Anacortes, Washington

Project No.: US0041081.0037 Task No: 4

This Health and Safety Plan (HASP) addresses the health and safety hazards of each task conducted by WSP Inc. (WSP) employees for this project, including the requirements and procedures for worker protection (per Washington Administrative Code Chapter 296-843, the WSP Hazardous Waste Operations and Emergency Response Program, and the Integrated Health, Safety, and Environment [HSE] Manual). The HASP was developed based on the hazards known or suspected to be present at the site, specifically as they relate to the work to be conducted by WSP employees. The hazards and controls within this HASP do not necessarily address all the hazards associated with subcontractor personnel. Subcontractors may use this document as a template for their own HASP; however, they will be responsible for reviewing and revising/amending the HASP to ensure that it addresses hazards unique to their operations.

The Site Health and Safety Officer (SHSO) can change or amend this document only with agreement from the Group Health, Safety, Security, and Environment Manager. The SHSO must initial any change made to the HASP at the relevant section and document the amendment date below. This document must be kept on site.

Prepared by:	Laurie Gneiding	WSP Managing Office:	Redmond WA
Approved by:	Koorus Tahghighi		February 23, 2026
	Project Manager		Date
Reviewed by:	Koorus Tahghighi		February 23, 2026
	Site Manager		Date
	Kyle Hanley		February 27, 2026
	SHSO		Date
Concurrence by:	Tré Wilson		February 23, 2026
	E&E HSE Director		Date
			Date

Amendment(s):

Prior to starting fieldwork, personnel (e.g., field personnel, subcontractors, authorized visitors, etc.) shall attend the pre-entry briefing covering the contents of this HASP. The briefing shall be conducted by the SHSO or designated representative and training documented by completing and signing the Site Orientation Form (**Appendix A**) and signing off on the WSP Field Team Review page of this HASP. By signing the Site Orientation Form and the WSP Field Team Review page, personnel acknowledge that they have attended the briefing, understand the potential safety and health hazards, and agree to perform work according to the requirements outlined in this HASP.

The SHSO will review the information covered in the pre-entry briefing meeting with any worker not in attendance at the initial meeting before beginning work. Brief meetings will be held at the beginning of each

workday to discuss important safety and health issues concerning tasks performed on that day and documented on the activity hazard analyses in **Appendix B**.

WSP Field Team Review: I acknowledge that I have read the requirements of this HASP and agree to abide by the procedures and limitations specified herein. I also acknowledge that I have been given an opportunity to have my questions answered regarding the HASP and its requirements prior to performing field activities. Health and safety training and medical surveillance requirements applicable to my field activities at this site are current and will not expire during on-site activities.

Name	Date	Name	Date

WHITMARSH LANDFILL HASP SUMMARY SHEET

Table S-1. Anticipated Hazards

Task	Chemical	Slip/Trip/Fall	Excavation-related	Nuisance dust	Biological	Heavy Equipment	Underground Utilities	Working on/near Water	Noise	Heat Stress	Cold Stress	Sunburn	Flying debris
Oversight of Building Demolition (Completed)	X	X		X	X	X			X	X	X	X	X
Oversight of landfill slope modification	X	X	X	X	X	X	X	X	X	X	X	X	
Oversight of sediment curtain placement	X	X			X	X		X	X	X	X	X	
Oversight of landfill grading	X	X	X	X	X	X	X		X	X	X	X	
Oversight of landfill capping/seeding		X		X	X	X			X	X	X	X	
Oversight of dewatering/water treatment.	X	X			X				X	X	X	X	
Oversight of well and gas probe installation		X				X	X		X	X	X	X	

Level D is the basic ensemble for this site. personal protective equipment may be upgraded or downgraded by the Health, Safety, and Environment Coordinator after discussion with SHSO/Project Manager based on site conditions and air monitoring results.

Table S-2. PPE Requirements – Technical Oversight

PPE (Level D)	Task 1: Building Demolition	Task 2: Landfill slope modifications	Task 3: Sediment curtain placement	Task 4: Landfill grading	Task 5: Landfill capping/seeding	Task 6: Dewatering/ water treatment
Gloves	Cut-resistant outer	Cut-resistant outer(+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil/mud contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in groundwater or soil contact)
Feet	Safety-toe and shank boots	Safety-toe and shank boots	Hip waders, safety-toe & shank boots, plus mudders	Safety-toe and shank boots	Safety-toe and shank boots	Safety-toe and shank boots
Head	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat
Eye	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses
Ear1	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25	Hearing protection with an NRR >25
Other (PFD, waders, etc.)2	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest; ring buoy	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest

Notes:
1. Wear hearing protection around loud operating equipment (if a normal conversation is hard to make out at a distance of 3 feet).
2. Life jacket and ring buoy in accordance with WAC 296-155-235 *et seq*, as necessary.

Abbreviations:
NRR = noise reduction ratio
PFD = personal flotation device
PPE = personal protective equipment
WAC = Washington Administrative Code

Table S-3. Action Levels for Air Monitoring.

Hazard	Tasks	Action Level	Response
Explosive Atmosphere	2–5	<10% LEL (in occupied work area) 10–20% LEL>20% LEL	Work with caution. Continue monitoring. Work with caution. Continuous monitoring required. Explosion hazard. Withdraw from area immediately. Note: Combustible gas readings may not be accurate in atmospheres with <19.5% oxygen.
Oxygen	2–5	<19.5% (in occupied work area) 19.5–21.5% >22%	Oxygen deficient. Exit area. Continue work. Exit area, identify source, and contact safety management.
Nuisance dust/ lead-contaminated soil	1, 2, and 4	Total dust action level: appreciable visible dust (1 mg/m^3) for more than 15 minutes	Control dust w/ engineering controls (e.g., water spray). If unable to control dust, consult project manager.

Abbreviations:
LEL = lower explosive limit
mg/m^3 = milligrams per cubic meter

Table S-4. Emergency Contacts

Agency	Telephone Numbers	
Fire Department:	911	
Hospital: Island Hospital, Anacortes	360-299-1300	
Police Department:	911	
TriageNow (early injury case management)	877-311-0038	
Name	**Office**	**Cell/Home**
Project Health and Safety Officer: Tim Reinhardt, CIH	206-838-8464	425-241-5816
Client Contact: Margo Gillaspy	360-416-1578	NA
Project Manager: Koorus Tahghighi	NA	206-641-6301
Principal in Charge: Dave Haddock	NA	425-246-7409
Group HSE Manager: Trevon Wilson (See Incident Flow Chart in Appendix D)	NA	316-202-9030
Poison Control Center	800-732-6985	NA
Ecology Northwest Regional Office	425-649-7000	NA
Oil Spill Hotline	800-645-7911	NA
Washington Division of Emergency Management	253-512-8031	NA

TABLE OF CONTENTS

Site-Specific Health and Safety Plan ii
Whitmarsh Landfill HASP Summary Sheet iv
1 Site Background 1
2 Key Personnel and Health and Safety Responsibilities 2
3 Site Activities 5
3.1 Hazard Assessment 5
3.1.1 Project Applicable Life Saving Actions 6
3.2 Physical Hazards 6
3.2.1 Cold Stress 6
3.2.2 Heat Stress 7
3.2.3 Heavy Equipment 9
3.2.4 Oversight Of Drilling Activities 9
3.2.5 Underground Utilities 10
3.2.6 Noise 11
3.2.7 Slip, Trip, And Fall Hazards 11
3.2.8 Working on or Near Water 12
3.3 Biological Hazards 12
3.3.1 Flying Insects 12
3.3.2 Ticks/Spiders 12
3.3.3 Irritating Vegetation 13
3.3.4 Snakes, Vermin, Feral Animals 13
3.4 Chemical Hazards 13
4 Personal Protective Equipment Requirements 17
4.1 Work Limitations 17
4.2 Monitoring Equipment Requirements 17
5 Work Zone Delineation 19
5.1 Support Zone 19
5.2 Contaminant Reduction Zone 19
5.2.1 Personnel 19
5.2.2 Samples and Sampling Equipment 20
5.2.3 Heavy Equipment and Vehicles (as applicable) 20
5.3 Work Zone (Hot Zone) 20
5.4 Decontamination Wastes 20
6 Site Operating Procedures 20
6.1 Initial Site Entry Procedures 20
6.2 Daily Operating Procedures 21
6.2.1 Tailgate Safety Meetings 21
6.2.2 Site Rules 21
6.2.3 Inspections 21
6.3 Confined Space Entry Procedures 22
6.4 Buddy System 22
6.5 Communications 22

7 Subcontractors/Third Parties/Suppliers – Interface Arrangements 22
7.1 Compliance 23
7.2 Subcontractor Safety Responsibilities 23
7.3 Reporting by the Subcontractors 23
7.4 Equipment Operators 23
8 Required Training 24
8.1 Hazard Communication Training 24
8.2 Hazardous Waste Operations Training 24
8.3 First Aid 24
8.4 Orientation Training and Daily Safety Meetings 24
8.5 BNSF Training 25
9 Medical Surveillance Requirements 25
10 Sanitation/Illumination 25
11 Site Emergency Action Plan 25
11.1 Emergency Contacts 25
11.2 Emergency Response Procedures 26
11.2.1 Earthquake 27
11.2.2 Communicable Diseases 28
11.2.3 Medical Incidents 28
12 Recordkeeping 30

LIST OF TABLES

Table S-1. Anticipated Hazards iv
Table S-2. PPE Requirements – Technical Oversight v
Table S-3. Action Levels for Air Monitoring. vi
Table S-4. Emergency Contacts vi
Table 1. Key Personnel Health and Safety Responsibilities 3
Table 2. Anticipated Hazards 5
Table 3. Wind Chill Factors 7
Table 4. Heat Indices 8
Table 5. Possible Heat Disorders Based on Heat Index 8
Table 6. Rest Periods for Temperatures Exceeding 72.5°F 8
Table 7. Chemical Hazards 14
Table 8. PPE Requirements – Technical Oversight 18
Table 9. Action Levels for Air Monitoring 19
Table 10. Subcontractors 23
Table 11. Emergency Contacts 26
Table 12 Emergency Case Management Procedures 30

LIST OF FIGURES

Figure 1. Site Location Map 1
Figure 2. Project Organizational Chart 2
Figure 3. Route to Hospital 29

LIST OF APPENDICES

Appendix A Forms and Checklists
Appendix B Activity Hazard Analyses
Appendix C Safety Data Sheets (TBD)
Appendix D Incident Reporting
Appendix E Introduction to WSP Health, Safety, Security, and Environment Management Systems

ACRONYMS AND ABBREVIATIONS

AHAs	activity hazard analyses
CPR	cardiopulmonary resuscitation
dBA	A-weighted decibels
DOSH	Washington Division of Occupational Safety and Health
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSE	health, safety, and environment
IDLH	Immediately Dangerous to Life and Health
mg/m^3	milligrams per cubic meter
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEL	permissible exposure limit
PID	photoionization detector
PPE	personal protective equipment
REL	recommended exposure limit
SDS	Safety Data Sheet
SHSO	Site Health and Safety Officer
TLV	threshold limit value
WAC	Washington Administrative Code

1 SITE BACKGROUND

The former March Point (Whitmarsh) Landfill is located north of South March Point Road at the base of a bluff in the tidelands area of Padilla Bay (Figure 1). The former landfill is bounded by South March Point Road to the south, a BNSF Railway Company line and Padilla Bay to the north and northeast, and the Swinomish Channel to the east and southeast. The property was originally undeveloped tidelands lying between the main Mount Vernon-Anacortes highway and the BNSF rail line, and it was originally owned by the state of Washington and managed by the Washington Department of Natural Resources.

Landfilling began in the 1950s, when the site was used by the public as an unregulated dump site. In 1961, Skagit County applied for and received a lease from the State to operate the landfill as a regulated solid waste disposal site. Skagit County operated the landfill as a "burn dump" and burned waste regularly until 1969. In 1969 or 1970, Skagit County stopped burning activities and converted the facility to a "sanitary landfill operation." From 1969 through 1973, the landfill was Skagit County's primary waste disposal facility. Skagit County Public Works records of waste accepted from 1970 to 1973 indicate that waste originated from the cities of Anacortes, Burlington, La Conner, Mt. Vernon, and Sedro-Woolley; rural Skagit County; Whidbey Island; and the Shell and Texaco refineries, among other sources.

Powdered vanadium catalysts have been reportedly dumped at the landfill. Other industrial wastes, including drummed wastes, are alleged to have been dumped at the landfill. In 1973 Skagit County opened the Inman Landfill and closed this facility. Closure consisted of grading the waste and capping it with 2 to 3 feet of soil.

The northern two-thirds of the former landfill was occupied by a cedar log mill, which operated in this location from the late 1980s to the 2000s. This portion of the former landfill contains several former buildings, equipment, and debris associated with the mill operations. The southern third of the former landfill is unoccupied and covered with light forest and grass (Figure 1).

Results of previous studies conducted at the site were summarized in the remedial investigation/feasibility study. Contaminants detected in water include metals, polychlorinated biphenyls (PCBs), and pesticides; contaminants detected in soil include metals, semivolatile organic compounds, PCBs, and pesticides. Both upland and offshore areas have been identified for further investigation due to potential exceedances of Model Toxics Control Act cleanup levels in soil, groundwater, and/or sediments.

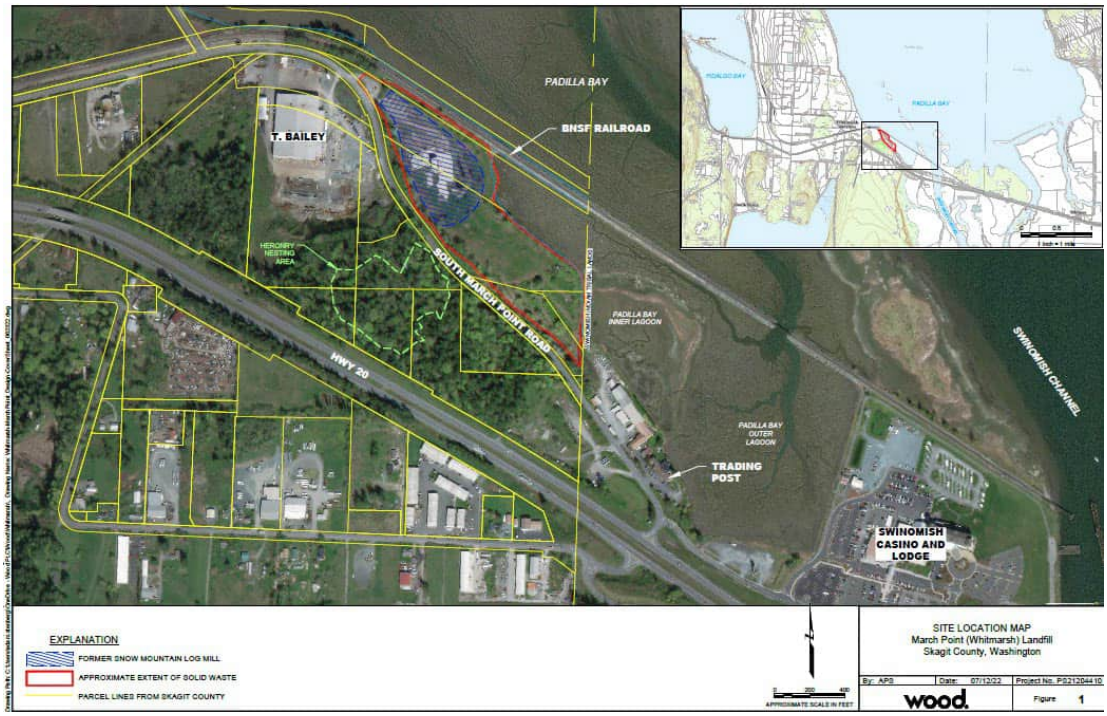
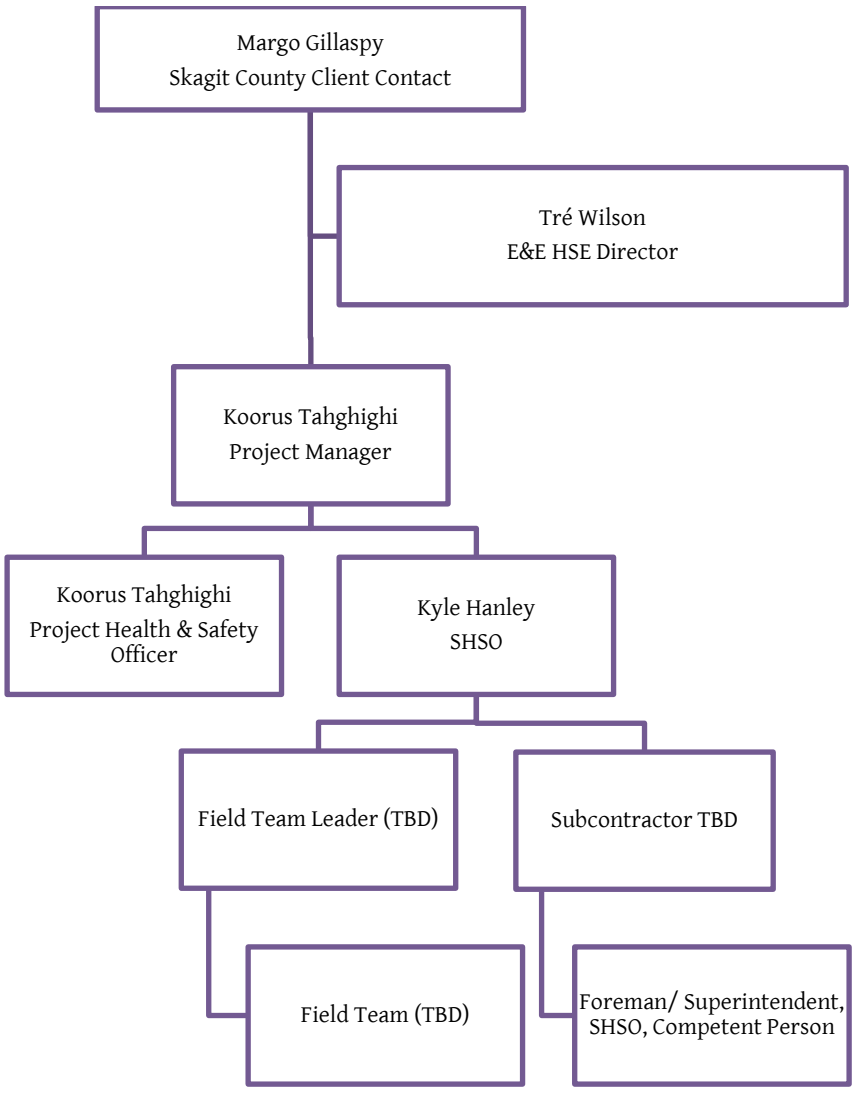


Figure 1. Site Location Map

2 KEY PERSONNEL AND HEALTH AND SAFETY RESPONSIBILITIES

The Project Manager has overall responsibility for health, safety and environment (HSE) on the project and is responsible for ensuring that the WSP HSE policy is communicated to site personnel, and that site personnel clearly understand their HSE roles and responsibilities on the project site.

Figure 2 shows the project organizational chart. **Table 1** describes health and safety responsibilities for key project personnel.



Abbreviations:
CIH = Certified Industrial Hygienist
HSE = health, safety, and environment
SHSO = Site Health and Safety Officer
TBD = to be determined

Figure 2. Project Organizational Chart

Table 1. Key Personnel Health and Safety Responsibilities

Position	Responsibilities
Group Senior HSE Manager	– Implement appropriate corporate health and safety policies, or environmental policies. – Approve HASP and amendments. – Notify E&E HSE Director of HSE in the event of an emergency situation. – Verify that corrective actions recommended on incident analysis forms (Appendix D) have been implemented. – Delegate project safety advisement as needed to a qualified project health and safety officer.
Project Manager	– Monitor that safety requirements of WSP, the client and relevant sections of OSHA regulations are applied and followed by employees, subcontractors, and visitors. – Ensure all project employees have the required training and are qualified to work in a safe manner. – Ensure employees are using the identified PPE and monitoring equipment. – Ensure HASP updates occur at least semi-annually or when conditions sufficient change or new hazards are observed. Communicate updates to site personnel. – Monitor organization of the work schedules and tasks to provide safe working conditions. – Verify that the safety meetings and inspections are performed as required. – Investigate all incidents fully, and coordinate with the SHSO regarding prevention of similar incidents in the future.
Site Manager	– Ensure HASP is read and understood by site personnel. Conduct and document tailgate safety meetings. – Use the Project Safety Readiness Review Checklist (Appendix A) to verify compliance with safety requirements. – Verify that appropriate monitoring equipment and PPE are available and used. – Manage any change by ensuring HSE risk assessments are conducted and AHAs developed for any new task. – Verify subcontractors have completed AHAs for their tasks. – Oversee subcontractor's compliance with safety regulations and contract requirements. – Ensure corrective actions identified on incident analysis forms (Appendix D) or from HSE inspections are implemented. – Enter reported or observed HSE hazard identifications and observations, into the iSMS database. – Report all incidents immediately and to arrange for medical treatment, as required, in case of injury or illness including transportation to a doctor or hospital.

Position	Responsibilities
Site Health and Safety Officer	– Implement project HASP. – Confirm site personnel meet proper medical requirements and have HAZWOPER training. – Ensure that subcontractor personnel have appropriate safety qualifications, training, certifications, that supervision and competent personnel are on site when the work is being conducted, subcontractors complete AHAs for their tasks, subcontractor inspections are being completed, and corrective actions are identified and closed. See the Project Safety Readiness Review Checklist (Appendix A). – Conduct pre-entry briefing and tailgate safety meetings. Document meetings on Tailgate Safety Meeting Form (Appendix A). – Verify that all monitoring equipment and PPE is operating correctly according to manufacturer's instructions and such equipment is used by on-site personnel. Calibrate or verify calibration of all monitoring equipment and record results. – Conduct weekly inspections of job site using the Site Safety and Health Checklist (Appendix A). – Implement site emergency and follow-up procedures, if necessary. – Enter reported or observed HSE hazard identifications and observations into the iSMS database.
Project Personnel	– Be familiar with and abide by the HASP. – Review AHAs before beginning tasks. – Wear required PPE. – Be aware of surroundings and perform a last-minute risk assessment before starting any task. – Notify the SHSO of any special medical conditions (e.g., allergies). – Immediately report any incidents and/or unsafe conditions or behavior observations to the SHSO. – Intervene and initiate your "Stop Work Authority" when hazardous conditions are identified.
Subcontractors	– Prepare and implement a HASP covering all job activities associated with the site. – Participate in HSE meetings (e.g., tailgates, safety committee, etc.). – Designate a subcontractor employee to act as a Competent Person, when required by regulation. – Understand and comply with WSP HSE policies and procedures and regulatory requirements applicable for their scope of work. – Do not direct or permit any employee to work under conditions that are not in compliance with any applicable OSHA standards. – Determine schedule and conduct inspections of their work area and equipment to ensure equipment is in good working order and work site hazards are identified and corrected. Schedule will be based on safe work practices and regulatory requirements. – Document any findings and will track corrective actions to closure. – Develop and provide WSP with a copy of their AHAs for each major phase of work prior to starting that work. – Follow emergency procedures outlined in their own HASP if they have been coordinated with the WSP HASP and follow regulatory requirements.

Abbreviations:
AHAs = activity hazard analyses
HASP = health and safety plan
HAZWOPER = Hazardous Waste Operations and Emergency Response
HSE = health, safety and environment
OSHA = Occupational Safety and Health Administration
PPE = personal protective equipment
SHSO = Site Health and Safety Officer

3 SITE ACTIVITIES

Tasks covered in this Health and Safety Plan (HASP) include oversight of the following:

- Building demolition;
- Landfill activities:
  - Modification of landfill slopes to consolidate buried waste into main portion of landfill,
  - Placement of clean fill,
  - Grading of top and perimeter of landfill,
  - Installation of groundwater monitoring wells and landfill gas probes,
  - Installation of landfill gas passive ventilation piping and compaction, and
  - Capping and seeding;
- Placement of temporary erosion control measures, including sediment curtain along water line; and
- On-site dewatering and water treatment prior to discharge to the sanitary sewer.

3.1 HAZARD ASSESSMENT

The scope of work to be performed and potential hazards to WSP personnel are provided in **Table 2.** Hazards to subcontractors will be covered in the subcontractors' HASP. Activity hazard analyses (AHAs) for each task or group of similar tasks are provided in **Appendix B**.

Table 2. Anticipated Hazards

Task	Chemical	Slip/Trip/Fall	Excavation-related	Nuisance dust	Biological	Heavy Equipment	Underground Utilities	Working on/near Water	Noise	Heat Stress	Cold Stress	Sunburn	Flying debris
1. Oversight of building demolition (completed)	X	X		X	X	X			X	X	X	X	X
2. Oversight of landfill slope modification	X	X	X	X	X	X	X	X	X	X	X	X	
3. Oversight of sediment curtain placement	X	X			X	X		X	X	X	X	X	
4. Oversight of landfill grading	X	X	X	X	X	X	X		X	X	X	X	
5. Oversight of landfill capping/seeding		X		X	X	X			X	X	X	X	
6. Oversight of dewatering/ water treatment	X	X			X				X	X	X	X	
7. Oversight of well and probe installation		X			X	X	X		X	X	X	X	

3.1.1 PROJECT APPLICABLE LIFE SAVING ACTIONS

The WSP Life Saving Actions checked in the list below potentially apply to the work being conducted at the site:

- Driving - Follow safe driving rules;
- Energy Sources - Verify isolation and zero energy before work begins;
- Ground stability – Inspect all excavations, ground structures and ground support prior to working;
- Hazardous Atmospheres – Test and monitor the atmosphere before entering and during work, obtain authorization before entering a confined space;
- Lone or Remote Work – Establish a communication plan with reporting times and escalation procedures.
- Suspended Loads - Plan lifting operations and control the area, keep yourself and others out of the line of fire;
- Work around heavy Mobile Equipment – Establish and obey signage, pedestrian paths, barriers and exclusion zones;
- Working at Height - Protect yourself against a fall when working at height; and
- Working On or Near Water – Assess weather and environmental conditions, wear proper PPE, and establish a rescue plan.

Expected start date:	April (end of March) 2026
Expected duration of project:	End December 2026
Expected average number of workers on site per day:	TBD

3.2 PHYSICAL HAZARDS

3.2.1 COLD STRESS

Weather conditions for workers outdoors during the winter months are conducive to producing cold stress. Two factors influence the development of a cold injury: ambient temperature and wind velocity. Wind chill is used to describe the chilling effects of moving air in combination with low temperature (**Table 3**). As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 miles per hour increases to 10 miles per hour. When using impermeable clothing (e.g., Saranex or Tyvek) and if the body is soaked with perspiration, the body is suddenly cooled when personal protective equipment (PPE) is removed. Because water conducts heat 240 times faster than air, the effects of cold are intensified if there is wind chill when the body is perspiration-soaked.

The areas of the body most susceptible to cold injury are those with high surface area to volume ratio (fingers, toes, nose, ears). Severe injury to these extremities may occur with extreme cold temperatures.

Table 3. Wind Chill Factors

Wind Speed (mph)	Local Temperature, ºF										
	32	23	14	5	-4	-13	-22	-31	-40	-49	-58
	Equivalent Temperature, °F										
Calm	32	23	14	5	-4	-13	-22	-31	-40	-49	-58
5	29	20	10	1	-9	-18	-28	-37	-47	-56	-65
10	18	7	-4	-15	-26	-37	-48	-59	-70	-81	-91
15	13	-1	-13	-25	-37	-49	-61	-73	-85	-97	-109
20	7	-6	-19	-32	-44	-57	-70	-83	-96	-109	-117
25	3	-10	-24	-37	-50	-64	-77	-90	-104	-117	-121
30	1	-13	-27	-41	-54	-68	-82	-97	-109	-123	-137
35	-1	-15	-29	-43	-57	-71	-85	-99	-113	-127	-142
40	-3	-17	-31	-45	-59	-74	-87	-102	-116	-131	-145
45	-3	-18	-32	-46	-61	-75	-89	-104	-118	-132	-147
50	-4	-18	-33	-47	-62	-76	-91	-105	-120	-134	-148
LITTLE DANGER FOR PROPERLY CLOTHED PERSONS Maximum danger of false sense of security				**CONSIDERABLE DANGER** Danger from freezing of exposed flesh within one minute		**VERY GREAT DANGER** Flesh may freeze within 30 seconds					

Note: Trench foot and immersion foot may occur at any point on this chart.
Abbreviations:
°F = degrees Fahrenheit

3.2.2 HEAT STRESS

Heat stress monitoring of workers and the environment will be initiated by the Site Health and Safety Officer (SHSO) when the ambient temperature exceeds 80 degrees Fahrenheit ˚F, or when the ambient temperature exceeds 52˚F if work is to occur in nonbreathable PPE, such as chemical resistant suits. Based on the heat index (**Table 4**) and potential dangers working at extreme temperatures and humidity (**Table 5**), field personnel will follow the work/rest periods listed in **Table 6**. It is important to note that elevated temperatures can significantly increase fatigue levels and negatively affect fitness for duty. Employees exposed to high heat conditions may experience quicker onset of fatigue. For activities that occur during high heat conditions, SA 217 Fit for Duty and Fatigue Management should be referenced to adjust work schedules.

Table 4. Heat Indices

Temp. (°F)	Relative Humidity									
	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
104	137									
102	130	137								
100	124	129	136							
98	117	123	128	134						
96	112	116	121	126	132					
94	106	110	114	119	124	129	135			
92	101	105	108	112	116	121	126	131		
90	97	100	103	106	109	113	117	122	127	132
88	93	95	98	100	103	106	110	113	117	121
86	89	91	96	95	97	100	102	105	108	112
84	86	88	89	90	92	94	96	98	100	103
82	84	84	85	86	88	89	90	91	93	95
80	81	82	82	83	84	84	85	86	86	87

Abbreviations:
°F = degrees Fahrenheit

Table 5. Possible Heat Disorders Based on Heat Index

Category	Heat Index (°F)	Possible Heat Disorders for People in High-Risk Groups
Extreme Danger	>130	Heat stroke and sunstroke likely.
Danger	105–129	Sunstroke, muscle cramps, heat exhaustion likely. Heatstroke likely w/prolonged exposure or physical activity.
Extreme Caution	90–105	Sunstroke, muscle cramps, heat exhaustion possible w/prolonged exposure or physical activity
Caution	80–90	Fatigue possible w/prolonged exposure or physical activity

Abbreviations:
°F = degrees Fahrenheit

Table 6. Rest Periods for Temperatures Exceeding 72.5°F

Temperature (°F)	Normal Work Clothing	Impermeable Work Clothing
>90	After each 45 minutes of work	After each 15 minutes of work
87.5–90	After each 60 minutes of work	After each 30 minutes of work
82.5–87.5	After each 90 minutes of work	After each 60 minutes of work
77.5–82.5	After each 120 minutes of work	After each 90 minutes of work
72.5–77.5	After each 150 minutes of work	After each 120 minutes of work

Abbreviations:
°F = degrees Fahrenheit

The warning symptoms of heat stress include fatigue; loss of strength; reduced accuracy; comprehension and retention; and reduced alertness and mental capacity. Heat stress is a collection of six heat-related illnesses:

1. *Heat edema,* which is characterized by swollen feet.
2. *Heat rash (prickly heat),* which is caused by tight clothing and aggravated by heat and humidity.
3. *Heat syncope,* which is a brief and sudden loss of consciousness brought on by dehydration, venous pooling (lack of movement), and/or isometric straining. It occurs more in sunlight, even w/o elevated temperatures.

4. *Heat cramps* in the hands, feet, or abdomen, which is caused by profuse sweating, inadequate salt intake, and/or inadequate fluid intake.
5. *Heat exhaustion*, also known as *heat toxemia* or *sunstroke*, which results from dehydration caused by decreased blood circulation. The symptoms include pallor, cool moist skin, nausea, headache, dizziness, "chills," sweating, and body temperature greater than 98.6°F but less than 104°F.
6. *Heat stroke,* which is the most severe form of heat stress whereby the body's normal regulatory mechanisms are overcome. The individual exhibits an altered mental state; red, hot usually dry skin (stopped sweating); nausea; strong rapid pulse; and a body temperature above 104°F (proteins denature at 107°F). If left untreated, the individual may exhibit delirium, convulsions, lapse into a coma, and possible death. *PERSONS EXHIBITING THESE SYMPTOMS SHOULD BE TRANSPORTED IMMEDIATELY TO HOSPITAL.*

Personnel shall monitor themselves for heat stress as instructed by the SHSO. Self-monitoring shall include checking of pulse rate within two to five minutes into the work break. A pulse rate greater than 110 beats per minute shall require shortening of the next work period by one-third the time. A pulse rate greater than 110 beats per minute the next rest period shall warrant the same action, etc. Heat stress monitoring will be coordinated and documented by the SHSO. The SHSO will also ensure that a sufficient quantity of suitably cool drinking water and access to shade is available to field personnel as required by WAC 296-307-97 Outdoor Heat Exposure and SA 309 Heat Illness Prevention.

3.2.3 HEAVY EQUIPMENT

During demolition and earth-moving operations, working components of heavy equipment (e.g., excavators) are periodically raised overhead and moved laterally. Thus, workers may be exposed to swinging equipment during operations, or may be exposed to crushing hazards if equipment falls or is carelessly lowered. Loose clothing may become entangled in cables/hydraulics used to raise and lower equipment or on the equipment itself. Lowered buckets may further pose a crushing hazard to hands or feet. Rough edges on buckets may cause cuts and abrasions. In accordance with SA 310 Mobile and Heavy Equipment, controls for equipment hazards include the following:

- Operate excavators, dump trucks, and other construction equipment in a safe manner. Equipment shall be operated by experienced operators.
- Inspect heavy equipment and components prior to bringing equipment on site, as well as on a daily basis, for unsafe conditions and/or faulty components, such as worn hydraulic hoses, excessive broken strands on wire cables, fuel line leaks, missing pins/bolt attachments, etc.
- Equip heavy equipment shall be equipped with a night-time backup alarm to alert workers.
- Establish a work zone around construction equipment and permit only those personnel and equipment required for the task within the zone.
- Make acknowledged eye contact with operator prior to approaching working equipment from the front and within view of the operator. The operator should put the bucket on the ground and remove hands from controls before personnel come within the swing radius.
- Wear appropriate clothing and equipment (site workers). Avoid wearing loose clothing.
- Wear work gloves to prevent cuts and abrasions from exposed spurs, wires, and edges on construction equipment. Operators should not have exposed jewelry.
- Train equipment operators in the operational hazards associated with the equipment, including safety features built into the equipment.
- Wear hearing protection when working around operating equipment.
- Do not get off or on any equipment while it is in motion.

- Operate machinery or equipment in a manner that will protect persons or property, including the operation of equipment at safe speeds and weight limits to be enforced.
- Wear PPE necessary to complete the task in a safe manner at all appropriate times.
- Employ good housekeeping principles:
- Store ancillary equipment in appropriate locations when not in use.
- DO NOT store/transport equipment on the excavator/backhoe.
- Keep work areas and controls free of materials, debris, & obstructions. Do not throw or drop tools.
- Heavy equipment shall possess adequate fire suppression equipment.

General safety procedures for construction equipment include:

- Operate construction equipment only from position of controls. Place in neutral before leaving control area.
- Do not smoke on any construction equipment.
- Do not operate construction equipment in icy/wet conditions or during electrical storms.
- Operate equipment within the rate capacity of hooks, rings, links, swivels, shackles, and other lifting aids.
- Keep excavator/backhoe buckets and dump truck beds lowered if the truck is unattended. Do not leave a suspended load unattended.
- Maintain excavator/backhoe on level ground with no distraction or disturbances for the operator.
- Stay clear of rotating parts.
- Maintain a distance of at least 15 feet from wires for heavy equipment.
- Operators shall not engage in any activity that would distract attention from the proper operation of the equipment.

3.2.4 OVERSIGHT OF DRILLING ACTIVITIES

Staff will stay clear and uphill of rig when moving the rig. When working on a slope, position personal and equipment uphill of the rig and keep a safe distance (30 feet min) from the drill rig when moving from boring to boring. A spotter should be used when reversing or navigating in tight spaces. Avoid standing in blind spots, engage in communication (verbal or signal) with drill rig operator and wait for the rig to be disengaged before approaching. Set and maintain a safe working distance from the rig prior to beginning drilling. WSP staff will keep away from the drill rig when in operation and make sure the operator knows where support staff are located at all times. It is important to be cautious of flying debris and liquids during auger drilling and rock coring. Sample tables and work areas should be set up at a distance equal to or greater than the fully extended mast plus 5 feet.

3.2.5 UNDERGROUND UTILITIES

Utilities may include utility lines, such as water, electric, gas, or telephone, as well as tanks, process piping, and sewers. If equipment is contacted or damaged, it can result in injury or death to workers, interruption of service, contamination of water, disruption of processes, and other costly delays.

WSP will ensure that the requirements of the WSP's Excavation, Trenching and Shoring procedure S.2.2.13 and Overhead and Underground Utility procedures SA 313 are adhered to prior to ground disturbance, including completion of the Excavation Checklist (**Appendix A**) by the competent person. If conflicting information exists on the location of utilities, if for any other reason the project manager, field manager, or site workers are uncertain as to the location of the utilities, or if gravel or other fill material is encountered, excavations will be conducted by hand digging.

3.2.6 NOISE

Activities conducted around noise-generating machinery, construction activities, demolition, and heavy equipment may expose workers to noise exceeding the DOSH exposure limit 85 A-weighted decibels (dBA) 8 hour-time weight average. The following effects can result from this noise:

- ***Psychological effects:*** workers being startled, annoyed, or distracted;
- ***Physiological effects:*** pain, temporary and/or permanent hearing loss, reduced muscular control (when exposure is severe); and
- ***Communication interference:*** increase in potential hazards due to the inability to warn of danger or properly issue instructions.

The hierarchy of controls listed in HS-EE-PRO-SA 216 Hearing Conservation Program dictates that elimination of the noise is most effective, followed by replacement of the noise, such as using quieter equipment or tools. The next recommended control is to isolate staff from the noise hazard, followed by limiting time exposure. If all of the above controls have been implemented to the maximum extent, only PPE remains at the bottom of the hierarchy as the least effective control.

It is anticipated that situations may arise when workers may be exposed to noise levels in excess of the 85 dBA, at which time each person will be provided with hearing protection, including during drilling operations and sampling operations when a generator is in use. The SHSO will require the use of hearing protection any time noise levels are high enough that a conversational tone of voice is difficult to hear at a distance of 3 feet.

Hearing protection maintenance includes the following practices:

- Do not reuse disposable ear plugs,
- Wash reusable plugs and canal caps to guard against dirt and bacteria,
- Wash and disinfect earmuffs,
- Discard reusable plugs or canal caps if they become hard or discolored,
- Replace worn cushion on earmuffs, and
- Store hearing protection in a clean plastic bag.

3.2.7 SLIP, TRIP, AND FALL HAZARDS

Slips, trips, and falls are the number one reason for injury on hazardous waste sites due to the combination of the large amount of equipment and the potential for PPE that restricts sight. Slips, trips, and falls will be minimized through implementation of the following housekeeping practices at all work sites:

- Store loose or light material and debris in designated areas and/or containers.
- Ensure tools, materials, extension cords, hoses, or debris are located so as not to cause tripping or other hazards. Adequately secure tools, materials, and equipment subject to displacement or falling.
- Secure all excavations, trenches, ditches, etc. and post as necessary.
- If possible, work on level ground. Work zones may have to be altered to ensure a safe, reasonably level area. Examine the work zones before work commences to select the safest areas to set up.
- Immediately clean any incidental fuel or fuel oil spills with absorbent material, and covered with sand or soil to preclude slipping.
- Avoid areas covered in ice/snow or remove the ice and snow, if possible.
- Clean any spills immediately.
- Remove obstacles from walkways and always keeping them free of clutter. When on site, ensure your work area is free of clutter (tripping on drill stems, tools, coolers, bottles etc.)

3.2.8 WORKING ON OR NEAR WATER

During placement of the sediment curtain, it will be necessary to work in or near water bodies. The banks of the bay in these areas may be soft and care should be taken to ensure safe entry and exit without getting stuck. "Mudder" high-flotation mud boots will be donned prior to walking into muddy intertidal areas on the site. Employees should be familiar with depth, tides, currents, and bottom conditions prior to working near water. No employee shall be permitted to work alone if there is a danger of drowning. Additionally, a personal flotation device is required for persons working over or within 6 feet of a large body of water. The AHA for sediment curtain placement oversight addresses these hazards and is included in **Appendix B**.

3.3 BIOLOGICAL HAZARDS

Biological hazards are represented by potential exposure to poison vegetation (e.g., poison oak and poison ivy) and insects (e.g., mosquitoes, ticks, wasps, bees, deer flies) and spiders.

3.3.1 FLYING INSECTS

Mosquitoes are flying insects that feed on the blood of warm-blooded animals in order to reproduce. Preventive measures include covering exposed skin and wearing a repellent that contains DEET. Personnel should be screened for allergic reactions to DEET before applying DEET to their skin. Stinging insects such as bees and wasps are common outdoor hazards prevalent in spring-fall seasons. Managing hazards from flying insects is included in the general site work AHA in **Appendix B**.

3.3.2 TICKS/SPIDERS

Spiders vary in size and are found in brush, woods, and vegetation. Western Washington has few spiders of medical concern, only yellow sac spiders and occasionally female black widow spiders. Hobo spider venom is not as toxic as once thought and they are not aggressive. Brown recluse spiders do not live in the state. Preventive measures to avoid spider bites are wearing gloves, avoiding touching spider webs, and checking clothing after being in the field.

Ticks are tiny and are found in brush, woods, and tall grass. May and June are the worst months for potential exposure, but the ticks are active in all months when the temperature exceeds 45°F. Preventative measures to avoid exposure to ticks include the following:

- Field personnel should wear long pants and long-sleeved shirts. It is recommended that pant cuffs be tucked inside the work boots or socks. Shirts should be tucked in. The use of light colored clothing may make it easier to spot ticks.
- Tick repellent should be applied to clothing and skin during the peak season. Permethrin containing repellent may be sprayed near the openings on work clothes (pant bottoms and waistband); permethrins should not be used on skin. On skin, DEET-containing repellent (< 33% DEET) should be applied. DEET should not be used on the face.
- All personnel should check for the presence of ticks or tick bites every day. Skin and hair should be checked for ticks. Many people get a spot on their skin in three to 30 days following a tick bite; the spot looks like a small red bullseye that is spreading out.
- If a tick is observed on the skin, it should be removed immediately: hold a tweezer on the tick as close to the skin as possible and pull. Kill the tick and retain for examination by a physician. WSP employees must report the incident to WorkCare and follow the WorkCare tick bite protocol.
- Performance of a blood test is appropriate following exposure to a tick bite. The Lyme blood test may not indicate positive results until two weeks or more after a tick bite. (Note: Ticks should not be killed with or stored in any liquid as this makes testing for Lyme disease impossible).

3.3.3 IRRITATING VEGETATION

To reduce the chances of dermatitis caused by poison oak, poison ivy or stinging nettle, personnel should wear long sleeves and long pants. Any exposed skin should be wiped downed several times a day with baby wipes or apply a blocking product (e.g., "Ivy Block").

3.3.4 SNAKES, VERMIN, FERAL ANIMALS

Snakes, vermin, and other animals may be present at the sites, particularly in vegetated areas, adjacent to stream/wetlands, or in/around non-occupied buildings. Personnel should check for the presence of these animals every day and avoid contact. There are no poisonous snakes resident in Western Washington.

3.4 CHEMICAL HAZARDS

Chemical hazards previously detected at the site are provided in **Table 7** along with their respective PELs. Based on their maximum detected concentrations in site soil samples, an inhalation hazard from site contaminants is not likely from exposure to airborne site dust. Incorporating a health-conservative safety factor of four, only lead would contribute appreciably to an inhalation hazard to site workers, and the airborne dust level would have to exceed 33 milligrams per cubic meter (mg/m^3), more than double the nuisance dust exposure limit of 15 mg/m^3.

The listed potential health effects are for exposure to high concentrations of these chemicals. There is no appreciable likelihood of encountering such concentrations from contact with soil, groundwater or airborne dusts that could be created on site, based on existing site characterization data.

Pursuant to section 5.0 of SA303 Hazard Communication Planning, an SDS (Safety Data Sheet) for any chemical brought onsite will be available to all staff onsite. All contractors shall provide an SDS for any applicable chemical hazards required onsite to the SSO .

Table 7. Chemical Hazards

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Arsenic	21 µg/L 14 mg/kg	0.002 mg/m^3	NIOSH POC: 5 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Ulceration of nasal septum, dermatitis	Respiratory irritation
Cadmium	2.7 mg/kg	0.005 mg/m^3	NIOSH POC: 5 mg/m^3	Strong oxidizers, elemental sulfur, selenium, tellurium	Inhalation, dermal contact	Chest pain, cough with bloody sputum, irritability, weakness, nausea, diarrhea, abdominal pain, burning sensation, salivation, cramps	difficulty breathing, sore throat, “metal fume fever” (shivering, sweating, body pains, headache), dizziness
Copper	38 µg/L 373 mg/kg	1 mg/m^3	100 mg/m^3	Oxidizers, alkalis	Inhalation, dermal contact	Eye irritation, dermatitis	Nose irritation, nasal septum perforation
Lead	24 µg/L 238 mg/kg	0.05 mg/m^3	1,000 mg/m^3	Strong oxidizers, hydrogen peroxide, acids	Inhalation, dermal contact	Eye irritation	Weakness, exhaustion, insomnia, anorexia, malnutrition, kidney disease
Manganese	782 µg/L	5 mg/m^3	500 mg/m^3	Oxidizers; reacts with water/ steam to product hydrogen gas	Inhalation	NA	Respiratory irritation, chest tightness, cough, dry throat
Mercury	6.9 mg/kg	0.1 mg/m^3	10 mg/m^3	Acetylene, ammonia, bleach, copper	Inhalation, dermal contact	Eye/skin irritation	Cough, chest pain, difficulty breathing, bronchitis, pneumonitis, irritability, headache
Molybdenum	40 µg/L 6 mg/kg	10 mg/m^3	5,000 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Eye irritation	Respiratory irritation
Nickel	72.2 µg/L 99 mg/kg	1 mg/m^3	10 mg/m^3	Strong acids, sulfur, wood & other combustibles	Inhalation, dermal contact	Contact dermatitis or hypersensitivity	Respiratory and nasal irritation, dizziness, giddiness, weakness
Strontium	72 mg/kg	NA	NA	NA	Inhalation, dermal contact	Skin/eye irritation	NA
Zinc	150 µg/L 381 mg/kg	5 mg/m^3	NA	Strong oxidizers	Inhalation (dust)	Skin lesions	Coughing, irritation
Benzo-(a)anthracene[5]	270 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation; dermal contact	Dermatitis	Bronchitis (potential occupational carcinogen)

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Benzo-(a)pyrene[5]	240 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation; dermal contact	Dermatitis	
Bis(2-ethylhexyl) phthalate	6,000 mg/kg	5 mg/m^3	5,000 mg/m^3	Nitrates, strong oxidizers, acids, alkalis	Inhalation; dermal contact	Skin/eye irritation	Mucous membrane irritation
Chrysene[5]	320 mg/kg	0.2 mg/m^3	80 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Dermatitis	Bronchitis (potential occupational carcinogen)
TPH-G	310 mg/kg	NA	NA	Strong oxidizers	Inhalation, dermal contact	Irritation of eyes, skin, mucous membrane; dermatitis	headache, lassitude (weakness, exhaustion), blurred vision, dizziness, slurred speech, confusion, possible liver, kidney damage (potential occupational carcinogen)
Aroclor 1254	240 mg/kg	0.5 mg/m^3	5 mg/m^3	Strong oxidizers	Inhalation, dermal contact	Chloracne, eye irritation	Reproductive effects, liver damager
Total PCBs	0.14 µg/L 690 mg/kg	NA	NA	NA			
Aldrin	390 mg/kg	0.25 mg/m^3	25 mg/m^3	Acids, oxidizers, phenol	Inhalation, dermal contact	Headache, dizziness, nausea, vomiting (potential carcinogen)	
Alpha-BHC	0.41 µg/L	0.5 mg/m^3	50 mg/m^3	Corrosive to metals	Inhalation, dermal contact	Eye/skin irritation	Nose throat irritation, headache, respiratory difficulty
Delta-BHC	120 mg/kg						
4,4'-DDD[6]	0.0082 µg/L	1 mg/m^3	500 mg/m^3	Strong oxidizers, alkalis	Inhalation, dermal contact	Eye/skin irritation	Parasthesia tongue, lips, face; tremors, anxiety, dizziness, confusion
Dieldrin	210 mg/kg	0.25 mg/m^3	50 mg/m^3	Strong oxidizers, sodium, strong acids, phenols	Inhalation, dermal contact	Headache, dizziness, nausea, vomiting, sweating; coma	
Methoxychlor	71 mg/kg	15 mg/m^3	5,000 mg/m^3	Oxidizers	Inhalation; dermal contact	NA	NA

Chemical	Concen-tration[1]	PEL[2]/REL[3]	IDLH[4]	Incompatible Materials	Relevant Potential Exposure Pathways[5]	Potential Dermal Health Effects	Potential Inhalation Health Effects
Nuisance dusts	NA	PEL: 10 mg/m^3 total particulates, 5 mg/m^3 respirable particulates	NA	varies	Incidental ingestion, inhalation, dermal contact	Skin irritation	Irritation eyes, throat, upper respiratory system

Notes:

1. Concentration based on the highest single soil sample.
2. Represents the maximum allowable 8-hour time-weighted average exposure concentration.
3. Based on a 10-hour time-weighted exposure.
4. The concentration to which a person could be exposed for 30 minutes without experiencing escape-impairing or irreversible health effects.
5. Based on coal tar pitch volatiles.
6. Based on 4,4-DDT.

Abbreviations:

µg/L = micrograms per liter
4,4'-DDD = 4,4′-Dichlorodiphenyldichloroethane
4,4'-DDT = 4,4′-Dichlorodiphenyltrichloroethane
IDLH = immediately dangerous to life and health
mg/kg = milligrams per kilogram
mg/m^3 = milligrams per cubic meter
NA = not applicable
NIOSH = National Institute for Occupational Safety and Health
PCB = polychlorinated biphenyl
PEL = permissible exposure limit
POC = potential occupational carcinogen
REL = recommended exposure limit

4 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Level D is the basic ensemble for this site. PPE may be upgraded or downgraded by the Health, Safety, and Environment (HSE) Coordinator after discussion with SHSO/Project Manager based on site conditions and air monitoring results. The PPE required for each task is listed in **Table 8**.

4.1 WORK LIMITATIONS

All work will be conducted during daylight hours unless proper lighting is provided in accordance with DOSH and OSHA regulations.

4.2 MONITORING EQUIPMENT REQUIREMENTS

The SHSO or designee will conduct air monitoring as necessary. Existing data do not warrant daily air monitoring for site contaminants, as there are no appreciable volatile organic compounds in the site contaminants. Airborne dusts air the only likely pathway for inhalation exposure to nonvolatile and semivolatile organic compounds. Modeling using the maximum reported concentration in site soil samples results in a mixture exposure limit of 1.0 (unitless ratio) for site contaminants only after disturbed soils reached an 8-hour average concentration above 30 $mg/m^3$of air. This is with a safety factor of four, which is a health-conservative assumption. Because the nuisance dust PEL is 15 mg/m^3, occupational dust exposures should never reach such high levels. Dust is readily visible at a concentration of 1.0 mg/m^3. The SHSO will observe activities that disturb site soils and require dust controls if visible dust levels are sustained for more than five minutes.

Site wells in the vicinity of the former sawmill have substantial methane concentrations at the wellhead upon initial opening, but these levels quickly dissipate. The SHSO will screen work area concentrations close to any newly-opened ground penetration, such as a monitoring well, using a four-gas meter to check oxygen and lower explosive limit, in that order. Monitoring readings will be logged in the field notebook. Direct reading instrumentation shall be calibrated in accordance with manufacturing requirements, (at least daily), and results of the calibration shall be documented in the field notebook. Action levels for each hazard are provided listed for each task in **Table 9**.

Table 8. PPE Requirements – Technical Oversight

PPE (Level D)	Task 1: Building Demolition	Task 2: Landfill slope modifications	Task 3: Sediment curtain placement	Task 4: Landfill grading	Task 5: Landfill capping/seeding	Task 6: Dewatering/ water treatment
Gloves	Cut-resistant outer	Cut-resistant outer(+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil/mud contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in soil contact)	Cut-resistant outer (+nitrile inner if in groundwater or soil contact)
Feet	Safety-toe and shank boots	Safety-toe and shank boots	Hip waders, safety-toe & shank boots, plus mudders	Safety-toe and shank boots	Safety-toe and shank boots	Safety-toe and shank boots
Head	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat	Hard hat
Eye	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses	Safety glasses
Ear[1]	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25	Hearing protection with an NRR ≥25
Other (PFD, waders, etc.)[2]	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest; ring buoy	Hi visibility safety vest	Hi visibility safety vest	Hi visibility safety vest

Notes:
1. Wear hearing protection around loud operating equipment (if a normal conversation is hard to make out at a distance of 3 feet).
2. Life jacket and ring buoy in accordance with WAC 296-155-235 *et seq*, as necessary.

Abbreviations:
PFD = personal flotation device
PPE = personal protective equipment
NRR = noise reduction ratio
WAC = Code of Federal Regulations

Table 9. Action Levels for Air Monitoring

Hazard	Tasks	Action Level	Response
Explosive Atmosphere	2–5	<10% LEL (in occupied work area) 10–20% LEL>20% LEL	Work with caution. Continue monitoring. Work with caution. Continuous monitoring required. Explosion hazard. Withdraw from area immediately. Note: Combustible gas readings may not be accurate in atmospheres with <19.5% oxygen.
Oxygen	2–5	<19.5% (in occupied work area) 19.5–21.5% >22%	Oxygen deficient. Exit area. Continue work. Exit area, identify source, and contact safety management.
Nuisance dust/ lead-contaminated soil	1, 2, and 4	Total dust action level: appreciable visible dust (1 mg/m^3) for more than 15 minutes	Control dust w/ engineering controls (e.g., water spray). If unable to control dust, consult project manager.

Abbreviations:
LEL = lower explosive limit
mg/m^3 = milligrams per cubic meter

5 WORK ZONE DELINEATION

Personnel will establish three zones at the work site: the support zone, the contaminant reduction zone, and the work zone or "hot" zone.

5.1 SUPPORT ZONE

The support zone will be situated in an upwind area that is free of contamination and will include:

- A storage area for clean safety and work equipment, and
- An area for rest breaks and the consumption of food and beverage, after washing of hands and face.

5.2 CONTAMINANT REDUCTION ZONE

Depending on the specific job task, personnel, sampling equipment, and/or heavy equipment may require decontamination. Sections 5.2.1 through 5.2.3 summarize general decontamination protocols.

5.2.1 PERSONNEL

Use steps and procedures outlined below as guidelines for personnel decontamination:

- Brush loose soil from body,
- Remove boots (where appropriate),
- Remove suit (where appropriate),
- Change outer gloves (if returning to sampling),
- Remove gloves, and
- Field wash hands.

5.2.2 SAMPLES AND SAMPLING EQUIPMENT

Separate decontamination lines will be used for decontamination of sampling equipment and for personnel. At a minimum, the following protocols will be followed for equipment decontamination:

- Hand augers and buckets will be washed in an Alconox and water solution or equivalent and rinsed in distilled water;
- Sampling equipment will be brushed clean and rinsed with distilled water or other appropriate cleaning material; and
- Samples will be dry-wiped prior to packaging.

5.2.3 HEAVY EQUIPMENT AND VEHICLES (AS APPLICABLE)

It is the responsibility of subcontractors to decontaminate heavy equipment in accordance with U.S. Environmental Protection Agency guidance.

WSP or personal/rental vehicles that become contaminated will be cleaned prior to leaving the site. The wheel wells, tires, sides of vehicles, etc. will be broom swept clean of dust and if muddy, undergo high-pressure washing at a location to be determined by the SHSO.

5.3 WORK ZONE (HOT ZONE)

This area is where hazardous chemicals are or may be present. The required job-specific PPE will be worn (Table 8). Any personal or rental vehicles in the work (hot) zone should have floorboards and seats protected by a drop cloth or other easily cleanable surface, and these interior surfaces must be cleaned upon leaving the hot zone.

5.4 DECONTAMINATION WASTES

Spent decontamination solutions will be disposed of in accordance with State of Washington requirements.

Decontamination shall be performed in a manner that minimizes the amount of waste generated.

6 SITE OPERATING PROCEDURES

6.1 INITIAL SITE ENTRY PROCEDURES

Site entry procedures shall be as follows:

- Ensure at least one WSP employee has a cell phone;
- Prior to working on-site, conduct an inspection for physical, chemical, and biological hazards;
- Conduct or review utility clearance prior to start of underground work; and
- Note any specialized protocols particular to work tasks associated with the project.

6.2 DAILY OPERATING PROCEDURES

6.2.1 TAILGATE SAFETY MEETINGS

Tailgate safety meetings must be held daily prior to work start or changes in task or type of activity and documented (**Appendix A**). Meetings must include the following information:

- Review and modify task-specific health and safety analys306is as necessary for all work activities; and
- Establish daily support, contaminant reduction, and work zones, as necessary. Employees will not enter the work zone unless proper PPE is used.

6.2.2 SITE RULES

Worker shall observe the following site rules:

- Employees shall not jeopardize their safety or health for any reason
- Employees will avoid unnecessary contact with contaminated materials. Do not sit down, kneel, or lay equipment on contaminated surfaces.
- Use monitoring instruments and follow designated protocol and contaminant action levels.
- Use PPE as specified.
- The DOSH 8-hour exposure limit for noise is 85 dBA averaged over an 8 hour time period; however, use hearing protection when noise levels exceed the action level of 85 dBA with a noise reduction ratio sufficient to reduce noise levels below the exposure limit. Noise can be estimated using smart phone apps such as the National Institute for Occupational Safety and Health app for Apple phones (www.cdc.gov/niosh/topics/noise/app.html) or other apps for Android phones.
- Remain upwind of operations and airborne contaminants, if possible.
- Establish a work/rest regime appropriate for ambient temperatures.
- Limit personal lifting to 40lbs whenever reasonably possible. For lifting of heavy, awkward, or bulky items, employees shall use mechanical aids or team lifting methods.
- Do not use smoke, chew gum or tobacco, or consume food in contaminated areas.
- Refer to SHSO for specific safety concerns for each individual site task.
- Be alert to your own physical condition.
- **All accidents and near misses, no matter how minor**, must be reported immediately to the SHSO and the Regional Health and Safety Manager.
- Refer to SA306 Employee Field Safety Work Rules for WSP standards for field safety.

6.2.3 INSPECTIONS

WSP personnel will be responsible for the following inspections:

- Daily HSE visual inspections will be conducted by the Field Manager;
- Weekly HSE inspections will be conducted by the SHSO; and
- Monthly inspections will be conducted by the Project Health and Safety Officer and/or the Project Manager.

Weekly and monthly inspections will be documented on the Site Safety and Health checklist (**Appendix A**). Corrective actions will be established for all findings and will be tracked to closure.

If applicable, subcontractors will inspect their equipment (i.e., drill rigs, heavy equipment, tools, etc.) and document the inspection in a log.

6.3 CONFINED SPACE ENTRY PROCEDURES

Site workers shall not enter permit-required confined spaces. Contact the HSE Coordinator.

6.4 BUDDY SYSTEM

Work will be conducted using the buddy system such that a line of sight will be maintained while in the work zone.

6.5 COMMUNICATIONS

Site personnel will carry cell phones. Numbers are listed in the chart below.

Name	Affiliation	Cell Phone
Koorus Tahghighi	WSP	(206) 641-6301
Kyle Hanley	WSP	1 (716) 392-8681
	WSP	
	WSP	

7 SUBCONTRACTORS/THIRD PARTIES/SUPPLIERS – INTERFACE ARRANGEMENTS

WSP will provide oversight and coordinate on-site/field activities to ensure the successful execution of tasks described within this HASP. Each subcontractor is responsible for providing supervision and a safe work place for its employees, as defined by the Washington State Department of Labor and Industries, Division of Occupational Safety and Health (DOSH) in Washington Administrative Code (WAC) Chapter 296-800, and will provide qualified personnel and/or competent persons as, and where, required by law or regulation. Each subcontractor will be responsible for managing and recording any injury or incident involving its employees as required by OSHA, DOSH, or other applicable laws and regulations on their own OSHA 300 forms. WSP will collect and enter subcontractor incidents into the WSP Incident database.

Subcontractors currently known and anticipated to work on the project are in identified in Table 10.

Table 10. Subcontractors

Subcontractor	Contact Information
Subcontractor Name: TBD	Name: Telephone #: Email:
Subcontractor Name:	Name: Telephone #: Email:
Subcontractor Name:	Name: Telephone #: Email:

7.1 COMPLIANCE

Each teaming partner and/or subcontractor is responsible for compliance with applicable federal, state, local, and WSP safety requirements, including but not limited to:

- Completion of their own site-specific HASP;
- Supplying PPE (boots, gloves, etc.) as required by site conditions and DOSH under WAC 296-800-160;
- Complying with WAC 296-155 (DOSH Construction Standards) and WAC 296-24 (DOSH General Safety and Health Standards);
- Providing and enforcing the requirements of individual subcontractor corporate safety programs and procedures as they relate to the project specific work contemplated; and
- Evaluating task-specific AHAs for construction activities performed.

7.2 SUBCONTRACTOR SAFETY RESPONSIBILITIES

Subcontractors will provide company- and site-specific health and safety procedures/safe work plans and AHAs to WSP for inclusion in the HASP, if requested. All subcontractors will be provided with a copy of this HASP and applicable AHAs (developed by either WSP and/or the subcontractor[s]). Subcontractors will develop AHAs for the work they perform and provide them to WSP for concurrence at least one week prior to commencement of site operations. WSP utilizes the U.S. Army Corps of Engineering form EM 385-1-1 f for the AHA. Work shall not begin until the AHA for the work activity has been accepted by WSP and discussed with all engaged in the activity, including WSP, subcontractor(s), and client on-site representatives at preparatory meetings. Subcontractors will review the HASP and AHAs with their employees and supervisors. Each worker is expected to sign the signature sheet, certifying that they understand and will comply with the requirements of this plan.

7.3 REPORTING BY THE SUBCONTRACTORS

Subcontractors will complete the Project Safety Readiness Review Checklist (**Appendix A**) and submit it to the WSP SHSO to document compliance with site HSE requirements.

7.4 EQUIPMENT OPERATORS

Operators of construction equipment shall be qualified by training or experience, meet the requirements of state, provincial, and local laws and regulations, and be authorized by the subcontractor. The subcontractor shall submit copies of certifications of competency to WSP from the employer or third party for equipment requiring

such certificates. Training shall be accomplished on the specific manufacturer and model of equipment to be used.

- The subcontractor shall certify that each operator has been trained and evaluated as required by OSHA, DOSH, or other applicable regulation. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.
- Proof of qualifications shall be kept on the project site for review.

Prior to digging, the appropriate digging permit must be obtained. All underground utilities in the work area must be positively identified by a private utility locating service in addition to any station locating service and coordinated with the station utility department. Any markings made during the utility investigation must be maintained throughout the contract.

8 REQUIRED TRAINING

8.1 HAZARD COMMUNICATION TRAINING

All site personnel (WSP and its subcontractors) shall be advised of the physical and chemical hazards associated with this project prior to commencement of work activities. Safety Data Sheets (SDSs) for chemicals used on site shall be kept on site and available to all workers at all times (**Appendix C**). WSP shall be responsible for acquiring all pertinent SDSs and the SHSO shall be responsible for upkeep of the SDSs at the job site.

8.2 HAZARDOUS WASTE OPERATIONS TRAINING

All site staff will have completed the OSHA 40-hour Hazardous Waste Operations Training, 24-hour on-site supervised training, and appropriate annual updates. In addition, Site Supervisors will have completed the required OSHA 8-hour supervisory training. Personnel trained in first aid and cardiopulmonary resuscitation (CPR) will also have bloodborne pathogen training as mandated by WAC 296-823. Occasional site workers that do not have the potential for exposure to contaminant concentrations exceeding PELs require, at a minimum, 24 hours of OSHA Hazardous Waste Operations Training and one day of on-site training and supervision. Personnel will be required to provide training certificates prior to site entry.

8.3 FIRST AID

The site supervisor or site health and safety officer will be current in CPR and first aid, and will ensure an equivalently trained person is in charge anytime more than one person is working on site. A first aid kit and emergency eyewash with an on-off valve that delivers at least 0.4 gals of water per minute for at least 15 minutes will be available at all times that work is in progress. These will be stored in a field vehicle during upland soil sampling or on board the boat during sediment/surface water/biota sampling. All on-site personnel will be advised of its location.

8.4 ORIENTATION TRAINING AND DAILY SAFETY MEETINGS

An on-site orientation session will be required for all site personnel, including subcontractors, prior to commencement of work and will include the following:

- Site layout;
- Health effects and hazards of the chemicals identified or suspected to be on site;
- Personnel protection, including the use, care, and fitting of PPE and its effectiveness and limitations;

- Decontamination procedures;
- Safe work practices; and
- Emergency procedures, including emergency contacts, instructions for implementing the emergency plan, and the route-to-hospital.

A daily safety meeting will be conducted and documented at the beginning of each workday or work shift. Health and safety considerations for the day's activities will be discussed and protective equipment necessary will be outlined. Problems related to personal protection, inclement weather, or the interpretation of newly available environmental monitoring data will be topics typically covered during these briefings. The Point of Work Risk Assessment form (**Appendix A**) will be used to supplement daily tailgate safety meetings, such when as a new task begins or conditions have changed that introduce new hazards.

8.5 BNSF TRAINING

All staff and subcontractors working within the BNSF right-of-waymust obtain online safety training from BNSF, prior to mobilization. The tracks are active and one or two trains a day use the line. BNSF will provide a flagger until the temporary fencing is established. See the following links for required training: www.BNSFContractor.com. www.everifile.com

9 MEDICAL SURVEILLANCE REQUIREMENTS

Personnel working on site shall participate in a medical surveillance program is consistent with the requirements of WAC 296-843 for hazardous waste site operations. The purpose of the program is to assess and monitor employee health prior to employment, during the course of, and at the termination of employment. Subcontractor employees are required to have been certified by their employer that they are in compliance with this requirement.

Copies of medical clearances and training records shall be made available to, and copies kept by, the SHSO prior to each individual on-site worker beginning site duties. Medical records and exposure records clearance for each on-site worker will be maintained in their individual personnel file at their respective office of employment.

10 SANITATION/ILLUMINATION

Restroom and washing facilities (potable water, soap, and disposable towels) will be available on site for use by field personnel.

Work will only be conducted during daylight hours.

11 SITE EMERGENCY ACTION PLAN

The purpose of this section is to safeguard human health and the environment in the event of an emergency. This section also addresses the emergency actions to be taken in response to an emergency. The responsibility of the regular day-to-day implementation of this information primarily lies with the SHSO. During an actual response situation, the SHSO will serve as the Emergency Coordinator.

11.1 EMERGENCY CONTACTS

A list of contacts and telephone numbers for the applicable local off-site emergency responders is provided in **Table 11**. The nature of the site work and constituents of concern should be reviewed and the ability of off-site

responders to respond to reasonably anticipated emergencies should be confirmed. Contact the off-site responders directly if there are any concerns about their responsibilities.

Table 11. Emergency Contacts

Agency	Telephone Numbers	
Fire Department:	911	
Hospital: Island Hospital, Anacortes	360-299-1300	
Police Department:	911	
TriageNow (early injury case management)	1-877-311-0038	
Name	**Office**	**Cell/Home**
Project Health and Safety Officer: Koorus Tahghighi		206-641-6301
Client Contact: Margo Gillaspy	360-416-1578	360-770-4213
Project Manager: Koorus Tahghighi	NA	206-641-6301
Principal in Charge: Dave Haddock	NA	425-246-7409
E&E HSE Manager: Tré Wilson (See Incident Flow Chart in Appendix D)	~~316-370-9678~~	316-202-9030
Poison Control Center	800-732-6985	NA
Ecology Northwest Regional Office	425-649-7000	NA
Oil Spill Hotline	800-645-7911	NA
Washington Division of Emergency Management	253-512-8031	NA

Abbreviations:
CIH = Certified Industrial Hygienist
HSE = health, safety and environment
NA = not available

11.2 EMERGENCY RESPONSE PROCEDURES

The following are potential emergencies that could occur on the project:

- Chemical spill
- Civil disturbance
- Earthquake
- Explosion
- Fire
- Hurricane
- Medical emergencies
- Severe storm
- Other: seiche (plan route to high ground)

In the event of an on-site emergency, The procedures general emergency procedures are delineated below. Additional specific procedures follow.

- The SHSO (or alternate) should be immediately notified via the on-site communication system. The SHSO will assume control of the emergency response.
- The SHSO will notify the Project Manager and the client contact of the emergency. The SHSO will then contact the Western Group Senior HSE Manager, who will contact the Senior Vice President of HSE.

- If applicable, the SHSO will contact off-site emergency responders (e.g., fire department, hospital, police department) and will inform the response team as to the nature and location of the emergency on site.
- If applicable, the SHSO will evacuate the Site. Site workers should move to the predetermined evacuation point (see Figure 2).
- For small fires, flames should be extinguished using the fire extinguisher, if safe to do so and workers are trained (within the past year). Large fires should be only handled by the local fire department.
- If chemicals are accidentally spilled or splashed into eyes or on skin, use eyewash and/or shower (if available).
- If a worker is injured, first aid should be administered by a certified first aid provider.
- An injured worker must be decontaminated appropriately.

After the response, the SHSO will follow up with the required company reporting procedures, including the Incident Analysis Forms (**Appendix D**).

11.2.1 EARTHQUAKE

The following shall be evaluated prior to an earthquake event:

11.2.1.1 Storage

Consider the following when storing materials:

- Large and heavy objects should be stored on lower shelves to prevent them from falling on employees.
- Shelving over 4½ feet in height should be fastened to the wall to prevent tipping over and blocking exits or causing traumatic injuries. Velcro™ restraints for computers and printers have been proven effective at preserving this costly equipment.
- Bottled goods, glass, and chemicals should not be stored in high places or left where they can freely slide on shelves. Chemicals should not be stored near places of potential ignition.
- Restraining hardware and secondary containment are recommended where chemicals are stored on open shelves. Lips can be installed at the edge of open shelving to help prevent items from sliding off. Care must be taken to ensure that incompatible hazardous materials are not stored in close proximity to each other.

11.2.1.2 During an Earthquake

if inside the building, **Drop, Cover, then Hold On**. Drop to your hands and knees. Cover your head and neck with your arms. Crawl only as far as needed to reach cover from falling materials. Hold on to any sturdy furniture until the shaking stops. If outside the building, move away from the structure and utility wires. The greatest danger from falling debris is just outside doorways and close to outer walls. Once in the open, stay there until the shaking stops.

11.2.1.3 After the Earthquake

- Be prepared for additional earthquake shocks (aftershocks). Although most of these are smaller than the main shock, some may be large enough to cause additional damage.
- Check for injuries. Do not attempt to move seriously injured persons unless they are in immediate danger of further injury.
- Listen to the radio (search the web if available) for the latest emergency bulletins and instructions from local authorities.
- Check utilities. If the odor of gas is detected, shut off the main gas valve and, if possible, open windows and exterior doors. Evacuate the facility and report the leakage to the fire department (dial 9-1-1). Do NOT re-enter the building until it is safe to do so. If electrical wiring is shorting out, shut off the current at the main box.

- Check the facility for structural damage and evacuate the facility if significant damage is detected.
- Clean up any spilled hazardous materials such as gasoline, oil, cleaning solvents, etc. in accordance with WSP policies and procedures, environmental regulations, and approved methods.
- Ensure that no one eats or drinks from open containers near shattered glass.
- Contact the fire department or police department only if a life-threatening emergency exists.

After resolution of the immediate emergency or as soon as practicable, the SHSO will notify the Group HSE Manager and complete the appropriate paperwork.

11.2.2 COMMUNICABLE DISEASES

The AHA for communicable disease prevention is provided in **Appendix B**.

11.2.3 MEDICAL INCIDENTS

In the event of any medical incident, immediately notify the WSP SHSO via cellular phone. If an incident requires more than first aid, the WSP SHSO, or designee will determine whether emergency services are needed or whether the employee can be safely transported to a medical service provider. If emergency services are needed, such as a life-threatening emergency, the WSP SHSO or designee shall contact emergency services by calling 911. Support from first aid/CPR/AED-trained site personnel may be provided at this time. Subsequent notifications to Project Management personnel should be made, as described in **Table 11**.

Depending on the type of medical incident, the employee may be transported by on-site first aid trained personnel to one of the facilities listed in Section 11.2.2.3 (for a non-life-threatening emergency) or as directed by the dispatcher/emergency response personnel (for a life-threatening emergency). Minor medical issues may be treated on site. Upon arrival of the appropriate emergency response personnel, field personnel shall defer authority and provide assistance as needed.

11.2.3.1 Medical Care for Non-Life-Threatening Incidents

Examples of medical care for non-life-threatening incidents that may be performed on site include care for minor cuts, minor bruises, minor abrasion, splinters, and insect bites. In case of a non-life-threatening medical incident, medical care may be self-administered or administered on site by a qualified person.

If an injury is not a life-threatening medical emergency, but the injured person(s) needs to seek medical attention, initial care may be administered on site by a qualified person, upon consent. Examples of this include twisted ankles, possible broken bones, and muscle strains. After initial care has been administrated, for WSP employees the WSP SHSO or designee will contact Work Care for instructions on where to transport the injured person. If instructed, the WSP SHSO or designee can transport the injured person to one of the identified clinic or hospitals in the area. For non-WSP employees, follow the injured person's company workplace injury case management program. If the SHSO is unable to transport the injured person themselves, they will call 911.

WorkCare 24/7 Hotline: (844) 268-1852

11.2.3.2 Life-Threatening Medical Emergency

Examples of life-threatening medical emergencies include unconsciousness; difficulty breathing or abnormal breathing; persistent chest pain; severe bleeding that does not stop; chemical or thermal burns; vomiting or passing blood; seizures; possible head, neck, back injuries; poisoning; and compound fractures (i.e., bone sticking through the skin). In case of a life-threatening medical emergency that occurs on site, personnel shall immediately contact emergency services by dialing 911.

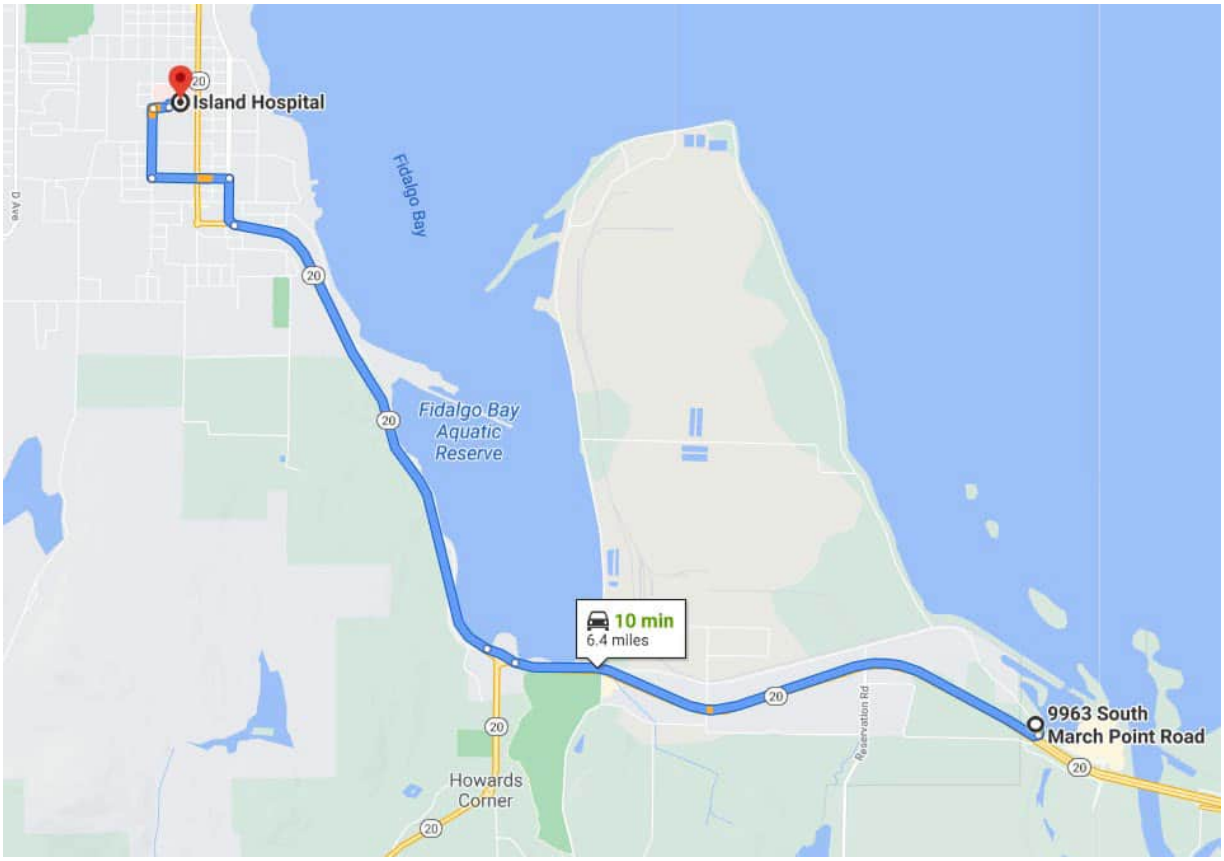
An emergency response transport vehicle or medical evacuation helicopter will be dispatched to the site. Personnel trained in first aid and CPR should assist the injured person until medical professionals arrive on site.

11.2.3.3 Hospitals/Clinics

A nearby hospital (for emergency injuries needing immediate treatment) and a clinic (for non-emergency injuries) have been identified.

The hospital to be used for emergency treatment is **Island Hospital, located at 1211 24th Street, Anacortes, Washington** (see Figure 3 for route to hospital).

Emergency: 911 **Non-Emergency: 360-299-1300**



9963 S March Point Rd
Anacortes, WA 98221, USA

1. Head south-east on S March Point Rd towards Casino Dr — 18 s (285 ft)

Follow WA-20 W and WA-20 Spur W to R Ave in Anacortes — 6 min (5.3 mi)

2. Turn right onto WA-20 W — 2.6 mi
3. Keep right — 0.2 mi
4. Continue straight onto WA-20 Spur W — 2.5 mi

Continue on R Ave to your destination — 4 min (1.1 mi)

5. Turn right onto R Ave — 0.2 mi
6. Turn left onto 32nd St — 0.4 mi
7. Turn right onto M Ave — 0.3 mi
8. Turn right onto 26th St — 410 ft
9. Turn left — 341 ft
   Destination will be on the left

Island Hospital
1211 24th St, Anacortes, WA 98221, United States

Figure 3. Route to Hospital

11.2.3.4 WSP Early Injury Case Management Program

If the emergency involves an injury to a WSP employee, the HSE Coordinator or Site Manager will implement the WSP Early Injury Case Management Program. The procedures are shown in **Table 12**.

Table 12 Emergency Case Management Procedures

Non-Emergency Incident	Emergency incident
Steps 1 & 2 must be completed before seeking medical attention other than local first aid. 1. Provide first aid as necessary. Report the situation to your immediate supervisor and HSE Coordinator (all incidents with the apparent starting event should be reported within 1 hour of occurrence). 2. Injured employee: **Call WorkCare 24/7 Hotline*** **(844) 268-1852**	1. Provide emergency first aid. Supervisor on duty must immediately call 911 or local emergency number; no employee may respond to outside queries without prior authorization. Any outside media calls concerning this incident must be referred immediately to Lauren Gallagher at 602-757-3211. 2. Once medical attention is sought and provided, the supervisor must: **Call WorkCare 24/7 Hotline*** **(844) 268-1852**
WorkCare will assess the situation and determine whether the incident requires further medical attention. During this process, WorkCare will perform the following: • Explain the process to the caller. • Determine the nature of the concern. • Provide appropriate medical advice to the caller. • Determine appropriate path forward with the caller. • Maintain appropriate medical confidentiality. • Help caller to execute path forward, including referral to the appropriate local medical facility. • Send an email notification to the Corporate HSE Department.	WorkCare will be responsible for performing the following: • Contact the treating physician. • Request copies of all medical records from clinic. • Send an email update to the corporate HSE department.
3. IMMEDIATELY after contacting WorkCare, send a brief email notification and inform verbally (direct contact is required) one of the HSE corporate representatives. See Appendix D for the incident flow chart. 4. Make all other local notifications and client notifications. 5. Local Supervisor, HSE Coordinator, SHSO, and any applicable safety committees must complete the preliminary investigation, along with the initial Incident Report entered into iSMS within 24 hours. 6. Corporate Loss Prevention Manager to complete Worker's Compensation Insurance notifications as needed. 7. Corporate HSE to conduct further incident notifications, investigation, include in statistics, classify, and develop lessons-learned materials.	

Note:
1. Step 2 is applicable only to the North American operations and to incidents involving WSP personnel. High-potential near misses, subcontractors' incidents, regulatory inspections, spills, and property damages above $1,000 should be reported immediately, following the directions in Step 3.

Abbreviations:
HSE = health, safety and environment
SHSO = Site Health and Safety Officer

12 RECORDKEEPING

At the end of the project, the following items should be maintained in the project file:

- HASP,
- Incident Analysis/Vehicle Incident Forms/Ground Disturbance Report (if applicable),
- Industrial Hygiene/Air Monitoring information, and
- Log notebooks.

APPENDIX A

FORMS AND CHECKLISTS

Site Safety Orientation Training Form

Project: _____ **Date:** _____

All applicable items listed below are to be reviewed on the first day of site activities and when new workers arrive on site.

Topic to Review:	Covered	N/A
1. Identity of Site Manager and the Site Health and Safety Officer (SHSO)	☐	☐
2. Contents of HASP	☐	☐
3. Review WSP Safety initiatives:	☐	☐
a. Life Saving Actions	☐	☐
b. iSMS Observations	☐	☐
4. Review HSE Objectives and Targets for Project	☐	☐
5. Contents of AHAs applicable to the work being conducted	☐	☐
6. Location of HASP and SDSs on site	☐	☐
7. HAZCOM labeling system if different from local operation	☐	☐
8. Site-specific medical surveillance requirements	☐	☐
9. Safety and health hazards on site	☐	☐
10. Site control measures and safety rules	☐	☐
11. Review monitoring instruments and action limits	☐	☐
12. Verify workers have documentation of training identified in Table 7-1	☐	☐
13. Site Specific/Client Specific training	☐	☐
14. The level of protection and specific PPE to be used	☐	☐
15. Work practices to be used on site to minimize exposure	☐	☐
16. Decontamination procedures	☐	☐
17. How to effectively use site/task engineering controls	☐	☐
18. Emergency communication (signals, codes, posted telephone numbers):	☐	☐
19. Emergency procedures (injuries, fires, hazardous materials incidents, etc.)	☐	☐
20. Location of Rally Point	☐	☐
21. Reporting incidents, near misses and HSE concerns	☐	☐
22. Any other site-specific health and safety-related requirements:	☐	☐

Trainee Name and Signature:

_____ _____

_____ _____

_____ _____

_____ _____

JOB SAFETY & ENVIRONMENT ANALYSIS

Date: **Time:**

Project and No.:

Site:

Supervisor: **Completed by:**

1 STOP

Stop and Assess:	Y	NA
Planning		
PSP/HASP communicated to Employees?	☐	☐
Employees sign review of PSP/HASP? Required	☐	☐
Permits to Work issued?	☐	☐
Preparation		
Employees fit for duty and not showing signs of fatigue?	☐	☐
Work not expected to exceed the fatigue requirements?	☐	☐
Required site inductions completed?	☐	☐
Employees hold the necessary competencies?	☐	☐
Employees have the required PPE?	☐	☐
Plant/equip/tools in good repair (incl. guarding & E stop)?	☐	☐
Site		
Emergency Response Plan in place &communicated?	☐	☐
Service clearance completed?	☐	☐
Current hardcopy digging clearance plans available on site?	☐	☐
Pre-work photographs taken?	☐	☐
Work area adequately delineated / protected?	☐	☐
Traffic control plan implemented (if applicable)? Emergency	☐	☐
and spill response equipment accessible?	☐	☐
Environment & Heritage		
Equipment free of visible weeds and pests?	☐	☐
Waste / substances stored away from sensitive receptors?	☐	☐
Secondary containment for substances / liquid waste?	☐	☐
Erosion and sediment controls installed?	☐	☐
Sensitive receptors protected from damage / disturbance?	☐	☐
Heritage items / artefacts protected from disturbance?	☐	☐
Plant inspected for evidence of fluid leaks & excess exhaust?	☐	☐

Notes:

2 THINK

DISCUSS THE TASK AND THE WORK ENVIRONMENT:

- Weather Forecast
- Site Conditions
- Daily Tasks
- Equipment, Material & Logistical Issues
- Interfacing Works / simultaneous operations

NO JOB IS SO URGENT THAT WE CANNOT MEET OUR HSE RESPONSIBILITIES.

You have the right to refuse, and authority to stop, work if you:

- Believe a HSE risk is not adequately controlled.
- Are unsure of the way to manage risk.
- Do not hold the necessary competency to manage the risk.

3 IDENTIFY

LIFE SAVING ACTIONS -I WILL... Y N



Plant / People Interaction ☐ ☐
- Position myself to be visible to the equipment operator and to avoid interactions with moving equipment.
- Establish and obey signage, pedestrian paths, barriers, and exclusion zones.
- Obtain authorisation from equipment operator prior to entering the zone of influence of mobile plant/equipment.



Driving ☐ ☐
- Only use a vehicle that is fit for purpose and checked prior to driving.
- Drive at a speed appropriate to the conditions and adhering to the road rules.
- Not use personal devices while driving except for hands-free navigation.
- Plan my journey to include regular breaks and fatigue checks.



Suspended Loads ☐ ☐
- Confirm that the equipment and load have been inspected and are fit for purpose
- Establish and obey barriers and exclusion zones
- Observe the instructions given by the banksman / flagman.
- Not place myself under a suspended load.



Lone or Remote Work ☐ ☐
- Carry reliable means of communication for check-ins and emergency calls.
- Establish a communication plan with reporting times and escalation procedure.
- Develop and test an emergency response and rescue plan.
- Have appropriate survival gear and training including first aid.



Working At Heights ☐ ☐
- Implement appropriate fall prevention / protection measures when exposed to a fall risk.
- Establish a rescue plan before commencing work at heights.
- Only work from or operating a mobile elevated work platform (MEWP) if trained, competent and authorised to do so.



Hazardous Substances/Atmospheres ☐ ☐
- Identify and control exposure to hazardous substances / atmospheres before starting work.
- Understand and follow the required procedures for entering a confined/restricted space.
- Test and monitor the atmosphere before entering and during work.
- Establish a rescue plan before entering a confined/restricted space.



Energy Sources ☐ ☐
- Identify all energy sources before work begins.
- Confirm that energy sources have been isolated and zero energy verified prior to undertaking work.
- Locate and control all buried and overhead services before starting work.



Working on/near Water ☐ ☐
- Assess the weather and environmental conditions when working on/around water.
- Not work alone from a vessel or near fast flowing or cold.
- Wear appropriate Personal Flotation Devices where required.
- Establish a rescue plan before working on/near water.



Ground Stability ☐ ☐
- Visually inspect all excavations, ground structures and ground support prior to working.
- Not enter areas of unsupported ground without appropriate ground stability measures in place.
- Place equipment and spoil at a safe distance from excavations.

Are there any other factors (not already covered) that could result in injury, illness, environmental harm, or property damage? ☐ ☐

If yes, record hazard & controls in Section 4

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

4 PLAN – plan what needs to be done to manage the risk

Hazards List any key hazards not in Section 3 or those not identified in the PSP/HASP	Risk Control Measures List the control measures required to eliminate or minimise the risk arising from the identified hazards. If risks cannot be controlled STOP and notify your Project Manager. Update the PSP/HASP if necessary.

Attendee	Signature

Attendee	Signature

Attendee	Signature

5 PROCEED – communicate and implement risk controls

Site Closure Checklist

- Equipment and materials removed or secured? ☐
- Waste collected and removed or securely stored and labelled? ☐
- Site restored to original condition, if required? ☐
- Area free from hazards created by the works? ☐
- Photographs taken of site on completion of works? ☐

Supervisor: **Time:**

Incidents/observations:

Record in iSMS as soon as possible.

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

PROJECT SAFETY READINESS REVIEW CHECKLIST

All information marked "✔" are to be completed by WSP and/or completed/submitted by all subcontractors.

Project Name: _____

WSP Site Manager Name: _____

WSP SHSO Name: _____

WSP E&E Staff (check box to the left if required and box to the right when submitted / done)	Submitted / Done	Date
Check if required:		
☑ Establish Safety Bulletin Board in common area, accessible by all. Post (as applicable):	☐	
☑ Emergency contacts	☐	
☑ Location of hard copy of HASP	☐	
☑ Map to emergency care	☐	
☑ OSHA Poster (US Only)	☐	
☑ Life Saving Actions Poster	☐	
☑ Install first aid kit & fire extinguisher in staff common area	☐	
☑ Provide initial site-specific job hazard training using AHAs.	☐	
☑ Verify employees have the required training (view documents) and that training is current	☐	
☑ Verify current medical monitoring	☐	
☑ Verify employees have PPE, as required in the HASP	☐	
☑ Verify all required air monitoring equipment is available and in good working condition.	☐	
☑ Hold a Pre-Construction Site Meeting with subs	☐	
☑ Hold an initial Mobilization (Kick-Off) Safety Meeting	☐	
☑ Provide WSP Project Safety Orientation training to all WSP employees and subs. Orientation training to include review of E&E HASP, AHAs, Life Saving Rules, etc.	☐	
☑ Establish emergency procedures for the project (e.g., communication methods, rally point, notifications, roles, responses)	☐	
☑ Establish subcontractor HSE interface arrangements (WSP's roles and responsibilities vs. subcontractor's, who conducts orientation training, inspections, meet schedules, etc.)	☐	
☐	☐	
☐	☐	

PROJECT SAFETY READINESS REVIEW CHECKLIST

Subcontractor (Box checked to the left is required. Check the box to the right when submitted / done)			Sub / Done	Date
Project Name:				
Subcontractor Company Name:				
Subcontractor Supervisor Name:		Phone #		
☑ Designate On-Site Safety Representative and OSHA Competent Person(s) (when required by OSHA regulations); provide emergency contact numbers.			☐	
Name of Safety Representative:		Phone #:		
Name of Competent Person:		Phone #:		
Name of Competent Person:		Phone #:		
☑ Subcontractor employees participate in WSP Project Safety Orientation.			☐	
☑ Subcontractor agrees to comply with WSP's HSE standards, procedures, processes and rules for the site.			☐	
☑ Subcontractor submitted relevant Standard Operating Procedures for the work to be conducted at the site (for medium to extreme hazards tasks).			☐	
☑ Subcontractor submitted an Inventory for chemicals brought to the site.			☐	
☑ Subcontractor submitted Safety Data Sheets for chemicals brought to the site.			☐	
☑ Subcontractor submitted initial site-specific Activity Hazard Analysis (AHA). (AHA's will be required to be submitted when a new operation or procedure is initiated.)			☐	
☑ Subcontractor provided initial site-specific Job Hazard Training using AHA's. Obtained signatures at the start of work. Provide periodic refreshers			☐	
☑ Subcontractor provided documentation of required training (e.g., HAZWOPER, HAZCOM, PPE, Fall Protection, Confined Space Entry, Respiratory Protection and fit testing, etc.), as applicable _____			☐	
☑ Subcontractor provided documentation of medical surveillance, if applicable			☐	
☑ Subcontractor verified employees have minimum PPE as identified in HASP and in the AHAs for the work to be conducted (e.g., hard hats, safety glasses, high visibility vests, safety toed boots, gloves).			☐	
☑ Subcontractor posted Project Emergency Procedures and phone numbers in trailers and by telephones.			☐	
☑ Subcontractor conducted and documented equipment inspections, as required by regulation or manufacturers recommendations, and that identified deficiencies are corrected, or the equipment is tagged out of service			☐	
☑ Subcontractor provided ground fault protection for all non-permanent wiring.			☐	

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Completion Checklist:

☐ Collect/review Site data for potential utilities
☐ Public underground utility locates (complete below)
☐ Private underground utility locates (complete below)
☐ Complete Site Plan (proposed boring locations, identified utilities)
☐ Conduct site reconciliation
☐ Deviation approval (as needed) (documented below)
☐ Identify overhead utilities (hazard assessment below)
☐ Communicate Emergency Procedures to onsite workers

Project Information			
Project Name and Number		**Client**	**Site Location**
Project Manager	**Site Supervisor**	**Subcontractor (s)**	**Date(s) of Work**
Description of ground disturbance activities (including who will be conducting the activities (WSP? Sub?))			
Project Manager Notified of any conflicts, changes to boring locations, issues, etc.? Describe			

Emergency Response	
Stop Work and follow the project Emergency Response Plan. -Take measures to protect the health and safety of others. -If risk to life, health, or property, Notify emergency responders and 811 -Notify the Project Manager and facility owner -Do not resume work until authorized -Enter incident in iSMS	**Additional Instructions:**

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Underground Utilities

Public Utility One - Call

Service name/contact info		Notification Made By (Name, Title and Company)		Date & Time of Call/Web Notification
Ticket No.	Legal Dig Date	Ticket Expiration Date		Ticket Renewal Date
Utilities Notified	Responded?	Utilities Present?	Emergency Number	Tolerance Zone Distance/other special instructions (e.g., daylighting required)

Private Utility Locator Information

Locator Company/Contact info	Contracted by	Date of service	Type of locate conducted (EM-Tracing, High-Resolution GPR)
Utilities Identified	Tolerance Zone	Other special instructions (e.g., daylighting required)	

Notes

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Underground Utilities Verification			
Onsite Visual Confirmation of Utilities			
Marking Color	**Utility Type and Potential Visual Clues**	**Cleared/ marked?**	**No markings - comments**
Blue	Potable water: fire hydrant, manholes; water meter, AST, interior connections, hose bib, valve box		
Yellow	Gas, oil steam, petroleum: gas meter, manholes; yellow bollards, interior connections, valve box		
Red	Electric power lines, lighting cables, parking lot lights, overhead lines (telephone poles), conduits: interior connections, underground vaults, manholes, transformers/switchgear, conduit on buildings		
Green	Sewer and drain lines: underground vaults, manholes, drain grates, leach field, sand mound, no evidence of sanitary sewer (for septic system)		
Orange	Communication, alarm or signal lines, cables or conduits: red/orange bollards, telephone poles, interior connections; manholes; conduit on buildings		
Purple	Reclaimed water, irrigation, and slurry lines: sprinkler heads, hose bibs		
Pink	Survey markings		
White/ Black	Proposed locations for excavation and drilling (black can be used for snow conditions)		

Deviation	
If any activities deviate from this procedure, obtain approval from the Project Manager and District Business Leader (or designee) before the work commences. Deviations may include, but not limited to: - When working with subcontractors, the company assumes subcontractor's (or Client's) utility clearance responsibilities established in the agreement -Not conducting public and/or private locates -Not conducting daylighting when required or there are unresolved inconsistencies	**Describe any deviations:**
Deviation Approval:	**Date:**

Verification	
Ground Disturbance Plan verified by:	**Date:**

Ground Disturbance Plan (GDP)/Utility Locates Form

This form is for all intrusive work, regardless of who is responsible for the public and/or private locates
HS-EE&EG-PRO-Overhead and Underground Utilities SA 313

Overhead Utilities

Survey your work area and identify any overhead utilities within 20ft (50ft for transmission lines)

Overhead Utilities Identified (type/voltage)	**Location**	**Required clearance distance (varies for type of equipment operated)**	**Controls** (e.g., move/change the activity, isolate, use barrier protection (insulated sleeves), use a competent line spotter/safety watch, have the utility de-energize or move power line, use warning lines with flags/post warning sign, use non-conductive tools)

Notes

Job Hazard Analysis (JHA)

This Job Hazard Analysis (JHA) is to be used with the Field Level Risk Assessment (FLRA)/Job Safety Analysis (JSA) and Project Safety Plan (PSP)

Monitoring

- Employees and subcontractors are required read and sign the JHA to verify they are aware of the necessary controls and responsibilities.
- Conduct a tailgate meeting/toolbox talk to manage situational risk at the beginning of, and or during, each shift.
- Employees to review risk control measures and practice situational awareness.
- Ongoing supervision by Supervisors.
- Senior Site visits conducted by senior leaders.

Review

JHA should be reviewed and updated, in consultation with employees and subcontractors, periodically

- For changes to the tasks, processes, systems of work, plant/equipment, substances, and work conditions that may affect HSE.
- As a result of a workplace incident occurring relating to the current JHA.
- When there is a change in legal or other requirements.

Project Name		**Client Name**	
Project Number		**Completed by**	
Project Location		**Date**	

Supervisors Persons responsible for ensuring compliance with JHA	**NAME**	**POSITION**	**ORGANIZATION**

Task Description	
Adjacent Sites / Ops	

Life Saving Actions		
	☐ Working around heavy and mobile equipment	☐ Working alone or in a remote area
	☐ Driving	☐ Working in areas of ground instability
	☐ Working around suspended loads	☐ Work around energy sources (incl. underground utilities)
	☐ Working in an area with hazardous atmosphere(s) or with hazardous substances	☐ Working at heights
	☐ Working on or near water	

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

Site Emergency	☐ Site emergency procedures available (If emergency procedures area not available or are insufficient, a project specific procedure must be created) ☐ Site owner will provide emergency procedures induction /Site induction Additional Information:

Competency/Training Requirements	COMPETENCY/TRAINING	ROLE / TASKS REQUIRING COMPETENCY
	▪	▪
	▪	▪
	▪	▪

Personal Protective Equipment Provide specifications and/or guidance for use			
	 ☐	 ☐	 ☐
	 ☐	 ☐	 ☐
	 ☐	 ☐	 ☐
	Other		

Associated Procedures			

Permits, Licenses, and Approvals	TYPE	ISSUED BY	ACTIVITY REQUIRING PERMIT, LICENSE, OR APPROVAL

Legal/other Requirements	
Additional Information	

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

Chemicals of Concern		Action Levels	
	▪		▪
	▪		▪
	▪		▪

Hazard Analysis

#	TASK STEPS	HAZARDS	INITIAL RISK			RISK CONTROL MEASURES	CONTROLLED RISK			RESPONSIBILITY
			S	L	RR		S	L	RR	
1.						▪				
2.						▪				
3.						▪				
4.						▪				
5.						▪				
6.						▪				
7.						▪				
8.						▪				
9.						▪				
10.						▪				

S – Severity | L – Likelihood | RR - Risk Rating)
S = (1) No injury/illness (2) Injury/illness first aid only (3) Injury/illness medical treatment (4) Disabling injury (5) Long-term disability or major disabling injury (6) fatal
L = (1) Very remote (2) Remote (3) Possible (4) Probable (5) Likely (6) Almost certain

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

On Site Changes and Review

Use this section to document additional hazards identified on site or during consultation with personnel undertaking the task.

#	TASK STEPS	HAZARDS	INITIAL RISK			RISK CONTROL MEASURES	CONTROLLED RISK			RESPONSIBILITY
			S	L	RR		S	L	RR	
A.						▪				
B.						▪				
C.						▪				

Employees and Subcontractor Acknowledgement

By signing this record, I acknowledge I have I have been provided instruction in these work methods and will comply with the requirements of the JHA.

NAME	ORGANIZATION	SIGNATURE	DATE

Supervisor Acknowledgement

By signing this, I agree with the work methods described herein.

Project Manager / Supervisor		**Signature**		**Date**

Where national and local statutory requirements and associated codes of practice prescribe a higher standard than those contained herein, the legislative requirements take precedence.

GENERAL DETAILS

A Journey Management Plan (JMP) is a critical control for your safety and for your team's safety. We strongly recommend that all travelers install and activate the free International SOS Assistance App on their mobile device.

1.0 INSTRUCTIONS

Please provide a copy of this Journey Management Plan to all check-in contacts listed in **Section 7.0**. If appropriate, include as part of the H&S plan.

2.0 TRAVELER DETAILS

Traveler's Name:

Cell/Mobile Number:

Secondary Device (satellite phone, etc.):

3.0 PURPOSE OF TRAVEL

☐ Field Work	☐ Office	☐ Other**:**

4.0 TRAVEL DETAILS (ITINERARY AND ACCOMMODATION) *

Segment (Departure/Arrival/Accommodation)	Travel Dates	Departure/Arrival Times
Additional Details: Exact times dependent on traffic and weather conditions		

* In lieu of completing the table, attach travel provider itinerary

5.0 MODES OF TRANSPORTATION*

☐ Air	☐ Rail	☐ Marine	☐ Fleet Vehicle
☐ Personal Vehicle			
☐ Rental Vehicle	Name:		
☐ Taxi/Shuttle	Name:		
☐ Client Transport	Name of Company & Driver (if known)		

*Identify all modes included in your travel and describe segment of travel (to/from airport, to/from destination country, to/from hotel, to/from site)

6.0 DESTINATION DETAILS

Contact/Client Name	Organisation	Address	Contact Number(s)
N/A			
N/A			

7.0 CHECK-IN CONTACTS/MONITORS

Contacts	Name	Phone/Email	Check-in Arrangement *(e.g. daily, upon arrival, etc. (include approximate time and time zones))*	Phone	Email	Text
Primary (WSP)			Daily, upon departure and arrival	☐	☐	☐
Other (if applicable)				☐	☐	☐

Please confirm with check-in contacts that they are available to fulfill this duty.

CHECK-IN DETAILS

Overdue interval to be agreed upon with Primary Contact: e.g. one hour after agreed upon check-in
Potential barrier(s) to check-in:
e.g. weather delays, travel delays, phone/internet connectivity, time zone, etc.
Plan to mitigate barrier(s):
e.g. travelers will advise primary contact if check-in arrangements change, traveler will ensure roaming is enabled on phone
Missed Check-in Procedure:
e.g. primary contact reaches out to traveler within 1 hr of missed check-in or primary contact reaches out to destination contact

8.0 DRIVING AND JOURNEY MANAGEMENT

If you intend to drive a vehicle on this journey, please complete this section:	
I am aware that I must not use a telephone whilst operating a vehicle, including hands free.	☒
I agree to follow the rules of the road in the country in which I am driving.	☒
I agree to use the safety devices of the vehicle in which I am driving.	☒
I agree to visually check the vehicle prior to use.	☒
I confirm that I am competent to operate a vehicle in the work location (valid license, appropriate driver training etc.)	☒
I confirm that my personal vehicle has the appropriate insurance and breakdown coverage in place.	☒
I confirm that I will review and assess the route prior to travel for additional hazards.	☒
I confirm that I will not operate a vehicle if fatigued (or legislative maximum of work and travel)	☒

9.0 TRAVEL RISK ASSESSMENT (IN ABSENCE OF FULL HSSE PLAN)

High Risk Hazards and Controls:	
Hazard	**Control**
COVID-19 Pandemic	Entry and departure testing arrangements: Entry COVID-19 documents: Vaccination requirements: Entry quarantine requirements: Face covering requirements for travel: Local curfews of destination:
Inclement Weather	*e.g., winter tires, slow driving speed, space between vehicles, emergency supplies*
Wildfires	*e.g., monitor conditions and air quality, PPE, evacuation routes, supplies*
Poor road conditions	*e.g., rough terrain, remote areas, lack of cell phone coverage*
Vehicle malfunction	*e.g., roadside assistance service*
Security threat	*e.g., avoid displaying jewelry or valuables such as laptop computers, do not carry large sums of cash, carry a charged phone and download the ISOS app, don't discuss your travel plans with strangers, confirm security of transport, in country emergency phone number*
Closed or delays at border crossing	*e.g., familiarize yourself with other border crossings in proximity, notify check in contacts of any delays, verify sufficient fuel in vehicle*
Loss of travel documents	*e.g., nearest US Consulate*

10.0 INTERNATIONAL TRAVEL ONLY*

Work in or travel to, or through, location(s)	Location Name	International SOS Travel (Security) Risk Rating	International SOS Medical Risk Rating	
Country:				
City:				
Have you downloaded the iSOS Assistance app to your phone, logged in, and reviewed the app settings? For instructions to download the International SOS Mobile Assistance App, visit International SOS here			Yes ☐	No ☐
Have you recorded relevant medical conditions on your International SOS Emergency Record? This information is available only to International SOS and used in the event of a medical incident while travelling.			Yes ☐	No ☐

Have you completed the iSOS training? (Required for High-Risk Countries) • Introduction to Membership • Travel risk awareness – security • Travel risk awareness - medical • Malaria awareness (if applicable) • Other (as needed)	Yes ☐	No ☐

*If travel requires work in, or travel to or through, High Risk Countries, you **must** be approved for travel. For more information, See WSP's International Travel guidance here.

11.0 EMERGENCY RESPONSE

International SOS can be contacted, at any of the numbers below at any time of day, for medical and / or security assistance and advice during travel. **Our WSP Corporate membership number is 02AABC000037.**

Philadelphia +1.215.942.8226	Singapore +65.6338.7800
London +44.20.8762.8008	Sydney +61.2.9372.2468

E&E Incident flow chart

If there is a life threatening injury, immediately call 911

For non-emergency work related injuries and illnesses such as sprains, strains, minor cuts and abrasions, follow the steps below:

Step 1:	Incident: notify Supervisors / Project Manager / HSE Manager within two hours of incident	Step 4:	Self-care / first-aid or referral
Step 2:	Call WorkCare within one hour of the incident (844) 268-1852 and before receiving any treatment	Step 5:	Recovery and return to work
Step 3:	Receive confidential care guidance from WorkCare	Step 6:	Enter incident into iSMS within 24 hours

WorkCare™
WORK MATTERS. HEALTH COUNTS.
(844) 268-1852

Enter all incidents into iSMS within 24hours

https://zeroharm.wspis.com/fieldforms

Download on the App Store

Get it on Google Play

Safety Manager Name/E-Mail	Earth & Environment Region	Contact Information
Jonathan Olsen jonathan.olsen@wsp.com	E&E USA	(512) 987-6209 (cell)
Greg Ertel gregory.ertel@wsp.com	Applied Solutions, Mining (interim)	(585) 465-0557 (cell)
Don Semon don.semon@wsp.com	Oil & Gas	(718) 496.83.21 (cell)
Kevin Dunsmore kevin.dunsmore@wsp.com	Southeast, Mid-Atlantic, CRS	(856) 373-6576 (cell)
Jeff Tweeddale jeff.tweeddale@wsp.com	Northeast, Midwest	(860) 805-5883 (cell)
Tré Wilson trevon.wilson@wsp.com	Mountain Pacific, California, Texas/Louisiana, Mining (interim)	(316) 202-9030 (cell)
Tom Bemrich Tom.Bemrich@wsp.com	Radiation Safety	(602) 315-2647 (cell)
Zach Manthey Zach.Manthey@wsp.com	Lab Safety	(602) 616-7703 (cell)

Incidents requiring reporting include, but not limited to: injuries, illnesses, near misses, observed hazards, positive observations, workplace violence / harassment, security incidents, subcontractor incidents, regulatory inspections, spills, and property damage.

The Supervisor/PM is responsible for Local/Client Notifications and Drug/Alcohol Testing coordination as per client requirements.

APPENDIX B

ACTIVITY HAZARD ANALYSES

AHA – Field Work General

Activity/Work Task:	**Field Work - General**	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/05/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Tim Reinhardt, CIH Senior Associate				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	H	H	S	S	M
Critical	H	S	S	M	L
Marginal	S	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability"** is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

- **H = High Risk**
- **S = Substantial Risk**
- **M = Moderate Risk**
- **L = Low Risk**

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Check all Life Saving Rules that apply:

	☐ Lone or Remote Work		☐ Ground Stability		☐ Hazardous Atmospheres - Substances		☑ Driving		☐ Energy Sources
			☐ Working Around Water		☑ Plant People Interface		☐ Suspended Loads		☐ Working at Height

AHA – Field Work General

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Mobilization	1A) Vehicular accident	M	Drive safely in accordance with company policies found in SA 209 Vehicle Safety and Incident Reporting. Do not use cell phone or portable electronic devices when driving. Ensure proper maintenance of the vehicle. Complete SA 209-01 Vehicle Safety Checklist. Carry required vehicle safety equipment while on project site.	L
2. Walking and working in the field	2A) Slips/trips/falls	M	Watch your footing. ▪ Site SHSO inspect the entire work area to identify and mark hazards. ▪ Do not talk on cell phone while walking. ▪ Slow down and use extra caution where items are on the ground or there are discontinuities (logs, rocks, and animal holes). ▪ Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. ▪ Wear laced boots with a minimum 8" high upper and non-skid Vibram-type soles for ankle support and traction. ▪ Maintain work areas safe and orderly; unloading areas should be on even terrain; mark or repair possible tripping hazards. ▪ Be aware of work area conditions that can cause slip hazards such as ponding of water on concrete surfaces. Ponding of water on smooth surfaces, such as concrete, coupled with freezing weather conditions has the potential to cause slippery conditions.	L

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2B) Damage to eyes	M	• Protect eyes by wearing safety glasses meeting ANSI Standard Z87 will be worn. ▪ Watch where you walk, especially around trees and brush with limbs sticking out. ▪ Exercise caution when clearing limbs from tree trunks. Use eye protection. ▪ Ultraviolet light from the sun can be damaging to the eyes; look for safety glasses that specify significant protection from UV-A and UV-B radiation.	L
	2C) Bee and wasp stings	M	▪ Inspect ground and vegetation for evidence of bee and wasp activity and avoid those areas if possible. Wear cut-resistant outer gloves, long-sleeve/pants and tuck into boots, and mosquito net if approaching a nest. ▪ Notify SHSO if allergic to stings and carry epinephrine injector as prescribed by a physician.	L
	2D) Ticks and infected mosquitos	M	Keep long sleeves and boots secured at ends and inspect clothing and body after working in tall vegetation. Apply insect repellent as necessary.	L
	2E) Lifting Injuries (e.g., Back Injuries)	S	Lifting Injuries (e.g., Back Injuries) ▪ Site personnel will be instructed on proper lifting techniques. Plan the lift and clear your path, stand close with feet shoulder-width apart, bend at the knees keeping your back straight, lift with the legs and not your back, and hold the load close while avoiding twisting motions. ▪ Perform warm-up excercises before starting work. ▪ Use two people to lift, lower, or carry equipment or materials heavier than 50 pound OR use mechanical devices to reduce manual handling of materials.	M

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2F) Vehicular Traffic and heavy equipment operation – Struck-by/Impaction	S	Struck by vehicle/equipment ▪ Spotters will be used when backing up trucks and heavy equipment and when moving equipment. ▪ Periodically scan for moving equipment. ▪ Back-up alarms must be functional on trucks such that the alarms are heard above ambient noise and at least 10 feet from the vehicle. ▪ Maintain a safe distance while machinery is in operation. Be aware of swing radius, lines under tension, and movement of the equipment. ▪ Drivers will keep workers on foot in their vision at all times, if you lose sight of someone, Stop ▪ Maintain line-of-sight of operators and drivers. ▪ Ground personnel in the vicinity of heavy equipment operations will be within the view of the operator at all times and will wear high visibility vests. ▪ Ground personnel will not stand directly behind heavy equipment when it is in operation. ▪ Maintain proper positioning while around heavy equipment in the established exclusion zone. Never walk behind the equipment, or between the equipment and a stationary object.	M
	2G) Overhead Hazards	S	Overhead Hazards ▪ Personnel will be required to wear hard hats that meet ANSI Standard Z89.1. ▪ All ground personnel will stay clear of suspended loads. ▪ All equipment will be provided with guards, canopies or grills to protect the operator from falling or flying objects. ▪ All overhead hazards will be identified prior to commencing work operations.	M
	2H) Dropped Objects	M	Dropped Objects ▪ Safety-toed boots with CR marking will be worn when handling heavy objects.	L

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Environmental health considerations	3A) Cold Extremes	S	Take precautions to prevent cold stress injuries ▪ Cover all exposed skin and be aware of frostbite. While cold air will not freeze the tissues of the lungs, slow down and use a mask or scarf to minimize the effect of cold air on air passages. ▪ Dress in layers with wicking garments (those that carry moisture away from the body – e.g., cotton) and a weatherproof slicker. A wool outer garment is recommended. ▪ Take layers off as you heat up; put them on as you cool down. ▪ Wear head protection that provides adequate insulation and protects the ears. ▪ Maintain your energy level. Avoid exhaustion and over-exertion which causes sweating, dampens clothing, and accelerates loss of body heat and increases the potential for hypothermia. ▪ Acclimate to the cold climate to minimize discomfort. ▪ Maintain adequate water/fluid intake to avoid dehydration.	M
	3B) Wind	S	▪ Wind chill greatly affects heat loss (see HASP). ▪ Take breaks in accordance HASP.	M
	3C) Thunderstorms	M	▪ Monitor weather channels to determine if electrical storms are forcased. ▪ Plan ahead and identify safe locations to be in the event of a storm. (e.g., sturdy building, vehicle, etc.) ▪ Suspend all field work at the first sound of thurnder. You should be in a safe place when the time between the lightning and thunder is less than 30 seconds. ▪ Only return to work 30 minutes after the after the last strike or sound of thunder	L
	3D) Wildlife	L	Avoid approaching any wildlife observed on site. Do not touch an ill or apparently dead animal.	VL

AHA – Field Work General

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
4. Cell phone/electronic device use in the field	4A) Distractions leading to innumerable hazards	M	Designate a safe location/distance away from the work area and traffic patterns for cell phone use. • All phone calls can wait until you have stopped work and moved to a safe location. • Never use a cell phone in an Exclusion Zone unless first moving to a safe location. Use of radios are recommended instead of cell phone use, • Remove chemically protective gloves before cell phone/electronic device handling, • Stand still when using cell phones and electronic devices, • Don't turn your back on traffic or heavy equipment movements, • Operating mobile equipment requires both hands. No cell phone use is allowed while operating mobile equipment including hands free.	L

AHA – Field Work General

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

AHA – Field Work General

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Activity/Work Task:	**Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping**	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025** **Date Accepted:**				
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	X	Plant/People Interface	X	Suspended Loads		Working on or Near Water	X	Ground Stability		Working at Heights
	X	Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Mobilization		M	See General Field Work AHA	L
2. Delivery and Off-loading/Re-loading of Excavator, Grader, Front-end Loader, etc.	2A) Struck by falling materials/equipment due to shifting during transport	S	▪ Prior to excavator delivery, assess area for uneven or soft ground, blind spots, tight quarters, etc. Direct truck driver to best location for off-loading. ▪ Ensure truck & trailer wheels are chocked and parking brakes are set prior to removal. ▪ Establish work zone. Ensure personnel do not enter during excavator off-loading.	M

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Excavator and other Equipment and Truck Operation	3A) Operational Safety	S	▪ Excavator shall be safety inspected before each shift. Inspection must be documented. ▪ Ensure operator is properly trained to operate the excavator or equipment. ▪ Operators and workers shall be familiar with proposed routes. ▪ Operator to familiarize themselves with terrain prior to entering work area. ▪ Ensure a clear path of travel to laydown area (check overhead hazards), discuss operability limits on steep slopes. ▪ Review hand signals with operator and ground crew. ▪ Ground crew will make eye contact with operator prior to approaching excavator. ▪ Ensure that operator will lower bucket when ground crew approaches.	M
	3B) Struck-by	S	▪ All ground personnel shall wear high visibility clothing per HASP ▪ Ground crew will make eye contact with operator prior to approaching equipment or truck and wait for operator to lower elevated components before approaching. ▪ Periodically scan environment to be aware of equipment. ▪ Be positioned to be visible to equipment operators and avoid interactions with moving equipment.	M
	3C) Noise	L	▪ Noise may be monitored using available noise measuring apps on a smartphone. If a normal conversation voice is hard to hear at 3 feet, assume the noise exceeds 85 dBA. ▪ Hearing protection shall be worn when noise levels exceed the OSHA action level of 85 dBA. Hearing protection minimum noise reduction rating (NRR) >25. ▪ Limit time spent near noise producing machines ▪ Increase distance from noise producing machines	L

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	3D) Exposure to soil contaminants/nuisance dust	S	▪ Wet down for dust suppression if visible dust is sustained per action levels in HASP. ▪ Wear safety glasses at all times in the exclusion zone. ▪ Do not eat or smoke within exclusion zone work areas. ▪ Avoid touching face/eyes with gloved hands while in contaminated work areas. ▪ Limit time spent in exclusion zone to time necessary to perofrm work activities. ▪ Follow all assigned personnel decontamination procedures as outlined in HASP (Section 5) and wash hands/face prior to taking breaks, eating, or using the restroom.	L
	3E) Possible slope collapse	S	▪ Keep unnecessary heavy equipment at least three feet away from unfinished cut slope edges. ▪ Keep spoils at least 3 feet from excavation edges ▪ Inspect excavation for cracks in the walls, slumping of soils or other hazards at the start of each shift or after any rain or water intrusion event.	M

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
SITE SUPERVISOR:	_____	SIGNED: _____	DATE: _____

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Oversight of Landfill Slope Modification, Landfill Grading, Landfill Seeding & Capping

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Sediment Curtain Placement Oversight

Activity/Work Task:	Sediment Curtain Placement Oversight	Substantial / High Risks:		Highest RAC: (residual)	**M**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	x	Plant/People Interface		Suspended Loads	X	Working on or Near Water	x	Ground Stability		Working at Heights
		Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Sediment Curtain Placement Oversight

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: • Work uniform or work clothes • Hard hat* • Safety glasses* • Safety-toed boots* • Gloves (per HASP) * • High-visibility reflective vests* • Hearing protection (as necessary)	**Competent / Qualified Personnel:** Name – Position/Employer **Training Requirements:** • HAZWOPER (40-hour, 8-hour Refresher, Supervisory, if applicable) • Site-Specific HASP Orientation • Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Field Work Over/Near Water	1A) Slips, trips, falls	S	▪ Familiarize self with site prior to visit. ▪ Complete appropriate training before going on site. ▪ Be aware of your surroundings including tide status and weather forecast. ▪ Always watch your footing: Slow down and use extra caution around logs, rocks, and in muddy areas. Extremely steep slopes (>50%) can be hazardous under wet or dry conditions; consider an alternate route. Wear work boots with a minimum 8" high upper and non-skid soles for ankle support and traction. ▪ Wear mudder overboots when in muddy intertidal areas. Use buddy system and stay within throwable flotation device range when venturing into these areas.	M

AHA – Sediment Curtain Placement Oversight

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	1B) Falling into water	S	▪ Use equipment that facilitates reaching the location from a safe distance (extensions, etc.). Assess safest access route in advance and in current weather and surface conditions. ▪ Whenever work will occur on a boat or within 6 feet of an unguarded edge near the water, a USCG-approved (for commercial use) personal flotation device shall be worn. It must be equipped with a whistle and a water-activated strobe beacon between dusk and dawn. Inspect PFD for defects prior to use. ▪ Work using the buddy system. Additional person within line of sight at all times when working on or adjacent to water. ▪ A throwable 30-inch flotation device with at least 90 feet of retrieval line must be available to the buddy within 75 feet of the operation. ▪ Avoid leaning over gunwales or edge of land to water, maintain three points of contact when at the water's edge or boarding a vessel. ▪ Avoid steep embankments with loose rip-rap. ▪ Be aware of depth, tides, currents, and bottom conditions	M
	1C) Pinch point/struck by	M	▪ Wear cut-resistant gloves. ▪ Do not place any body part between boat gunwale and another vessel, a fixed object or a line that may become taught.	L
	1D) Noise	L	▪ Noise may be monitored using available noise measuring apps on a smartphone. If a normal conversation voice is hard to hear at 3 feet, assume the noise exceeds 85 dBA. ▪ Hearing protection shall be worn when noise levels exceed the OSHA action level of 85 dBA. Hearing protection minimum noise reduction rating (NRR) >25. ▪ Limit time spent near noise producing machines ▪ Increase distance from noise producing machines	L

AHA – Sediment Curtain Placement Oversight

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Sediment Curtain Placement Oversight

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Oversight of Dewatering/Water Treatment

Activity/Work Task:	**Oversight of Dewatering/Water Treatment**		Substantial / High Risks:		Highest RAC: (residual) **L**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Scientist				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Associate				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	H	H	S	S	M
Critical	H	S	S	M	L
Marginal	S	M	M	L	L
Negligible	M	L	L	L	L

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

Think Different

Life Saving Actions	x	Plant/People Interface		Suspended Loads		Working on or Near Water		Ground Stability	x	Working at Heights
		Driving	X	Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Oversight of Dewatering/Water Treatment

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
The following PPE are necessary for the decontamination task: • Hard hat* • Safety glasses or goggles* • Face shield • Safety-toed boots* • Gloves (see HASP for type) * • Reflective vests* •	**Competent / Qualified Personnel:** See HASP – Name – Position/Employer **Training Requirements:** Site-Specific HASP Orientation Toolbox safety meeting • Task kick-off meeting	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Oversee deployment of tankage and hose lays	Strain and crush hazard from lifting and moving heavy items Slip, trip and fall	M	Materials Handling ▪ Use proper lifting techniques. Plan the lift and clear your path, stand close with feet shoulder-width apart, bend at the knees keeping your back straight, lift with the legs and not your back, and hold the load close while avoiding twisting motions. ▪ Use mechanical aids, if available, to move heavy items (over 40 lbs). Slip, trip and fall ▪ Avoid creation of trip hazards, flag hoses in path of travel.	L
2. Oversee pump and discharge operations	High-pressure hose whip strike or spray by wastewater Noise from pump operations. Fire from refueling hot pump.	M	▪ Wear safety glasses and hard hat. ▪ Ensure contractor secures all connections under pressure before charging lines. Use of cam-lock hook-and-loop straps is recommended. ▪ Wait for gas-powered pump to cool before refueling. Have portable ABC-rated fire extinguisher within 75 feet. ▪ **Wear hearing protection (see general field work AHA).**	L

AHA – Oversight of Dewatering/Water Treatment

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
3. Collect water quality samples	Chemical exposure when handling contaminated sample jars and equipment Fall from elevated tank locations.	**M**	Chemical exposure ▪ Wear safety glasses and PPE as outlined in the HASP. ▪ Refer to SDSs (Attachment H) for specific hazards associated with decontamination solutions. Check sample jars for preservative leaks. ▪ Limit exposure (time and distance) to chemicals to required work activities. Fall hazard ▪ **Ensure guardrail is in place on elevated tank perimeter, or use a safely installed and inspected portable ladder.** ▪ Maintain 3 points of contact ▪ Ladder should be insepcted for integrity, clean rungs, and stability prior to use.	**L**
4. Personal Decontamination	Exposure to contaminants	**M**	Exposure to contaminants ▪ Remove gross contamination (e.g., mud) before entering CRZ. ▪ Removal of PPE will be performed by the following tasks in the listed order: o Gross boot wash and rinse and removal o Outer glove removal o Suit removal o Respirator removal (if worn). o Inner glove removal ▪ Contaminated PPE is to be placed in the appropriate, provided receptacles. ▪ Respirators will be removed and decontaminated at a specified location within the CRZ by a designated technician, then placed in storage bag. ▪ Employees will wash hands, face, and any other exposed areas with soap and water. ▪ Portable eyewash stations and showers will be available should employees come into direct contact with contaminated materials. ▪ Limit exposure to hazardous contaminants to required work tasks. ▪ **Decon solutions will be disposed of according to the work plan.**	**L**

AHA – Oversight of Dewatering/Water Treatment

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Oversight of Dewatering/Water Treatment

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Communicable Disease Prevention

Activity/Work Task:	**Communicable Disease Prevention**	Substantial / High Risks:		Highest RAC: (residual)	**L**
Project Location:	**Whitmarsh Landfill**				
Contract Number:	US0041081.0037				
Date Prepared:	**11/6/2025**	**Date Accepted:**			
Prepared by (Name/Title):	Kyle Hanley Environmental Science				
Reviewed by (Name/Title):	Rami Atallah, CIH Senior Industrial Hygienist				

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	**H**	**H**	**S**	**S**	**M**
Critical	**H**	**S**	**S**	**M**	**L**
Marginal	**S**	**M**	**M**	**L**	**L**
Negligible	**M**	**L**	**L**	**L**	**L**

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:

- Establishing site specific measures for the specified activity
- **BOLD hazards correspond to Substantial or High Risk**.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the project HASP or client information for additional requirements, and emergency procedures.

Workers to follow general site safety controls for Hazard Signage/PPE, Housekeeping, Slips Trips and Falls, Biological hazards, Mobile equipment, Confined spaces, Fall hazards, Electrical, and any active operating equipment or construction activities.

Step 1: Review each **"Hazard"** to identify Probability and Severity (Refer to Project HSE Risk Characterization Form)

- **"Probability**" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.
- **"Severity"** is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal or Negligible

Step 2: Identify the RAC-Inherent as H, S, M, or L for each "Hazard" on AHA, ***before* controls are applied.**

Step 3: Identify the RAC-Residual as H, S, M, or L for each "Hazard" on AHA, ***after* controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

Risk Categories

H = High Risk

S = Substantial Risk

M = Moderate Risk

L = Low Risk

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Life Saving Actions	X	Plant/People Interface		Suspended Loads		Working on or Near Water		Ground Stability		Working at Heights
		Driving		Hazardous Atmospheres/ Substances		Lone or Remote Work		Energy Sources		

AHA – Communicable Disease Prevention

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Cell phone. Running water with handwashing soap and/or hand sanitizer. Disinfecting wipes and cleaners. Refer to Minimum PPE Requirements and specify as per risk assessment where required.	See Emergency Contact List posted on safety boards and/or HASPs for additional contacts if needed. **Training requirements:** • Incident and iSMS reporting • Fit For Duty • Any other trainings required by the site-specific HASP	• Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service. • Inspect all PPE prior to use.

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Pre-Work Preparation	• Failure to prepare. • Failure to identify or report a hazard and subsequent potential or actual illness and subsequent business continuity impacts. • Unfamiliar with current global/local events and client, WSP and/or government directives. • Not prepared to implement face-covering, spacing or sanitation requirements	M	• Monitor communicable disease-related information issued by local public health or government agency, or HSE Team and follow all directions from medical health officers and local health authority. • WSP team to stay up to date with current WSP directives/procedures. • Ensure workers understand scope of work, hazard and incident reporting process, emergency response procedures and location of emergency response equipment. • Keep workforce briefed on situation daily through tailgates, unscheduled HSE meetings or workplace posters. if needed. • Post signs at entrances stating that workers are not to come to work if feeling unwell or experiencing symptoms of communicable disease • Encourage vaccination and remaining up to date with boosters, and comply with site/client requirements for vaccination, where applicable. • Have adequate supply of face coverings, preferably K95/N95 or a tight fitting covering with a tight weave and minimal gaps between the face and mask. Have a supply of hand sanitizers and cleaning supplies. Be aware of space restrictions and avoid close contact if possible.	L

AHA – Communicable Disease Prevention

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
2. Symptoms Reporting	• Failure to identify or report a hazard and subsequent potential or actual illness and subsequent business continuity impacts.	M	• Everyone should complete a 'self-check' prior to coming to work • Stay home if: - Feeling unwell (e.g., fever, chills, coughing, diarrhea, etc.) - Testing positive for a communicable disease - Directed to isolate or quarantine • If you develop symptoms of a communicable disease, notify your supervisor and follow applicable local jurisdictional and WSP quarantine and self isolation requirements . - Complete required pre-entrance forms, where required.	L
	2B) Damage to eyes	M	• Support employees who are seeking guidance on self-screening to the local public health guidance to self-evaluate: • Canada: **AB**, **BC**, **MB**, **NB**, **NL**, **NWT/NU**, **NS**, **ON**, **PEI**, **QC**, **SK**, **YK** - **US: CDC** COVID-19 Quarantine and Isolation calculator	L
3. Quarantine and Self-Isolation	Failure to isolate and subsequent potential or actual illness and subsequent business continuity impacts.	M	- **Self-Isolate:** Individuals who test positive and/or are symptomatic with COVID -19, must not attend WSP's offices or worksites.	L
	Failure to quarantine and subsequent potential or actual illness and subsequent business continuity impacts.	M	Self-Quarantine: Individuals who are identified as close contacts must follow the jurisdictional quarantine requirements. This may vary according to vaccination status. Where close contacts are not required to quarantine, then WSP requirements recommend testing on day 2 and 5. Individuals who are identified as close contacts must wear a surgical grade mask or above if attending the worksite or office.	L
4. Hygiene Protocols	Failure to apply controls measures and prevent spread of communicable disease due to transfer of infectious material from the hands or other parts of the body (eyes, nose and mouth), or transmission of droplets or airborne routes.	M	• Provide running water with handwashing soap and/or hand sanitizer and encourgage their use through use of signage, reminders in HSE meetings, etc. • Avoid touching face, especially nose, eyes. • Wash hands frequently; before and after eating; after you have been in a public place; after using the washroom; after coughing and sneezing; after touching surfaces that other people also touch - Use a tissue if experiencing runny nose and dispose. Alternatively cough and/or sneeze into the crook of arm.	L

AHA – Communicable Disease Prevention

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
5. Cleaning	Failure to apply controls measures and prevent spread of communicable disease due to transfer via high touch surfaces	M	• Provide disinfecting wipes/cleaners and encourage their use through use of signage, reminders in HSE meetings, etc. - Continue to clean high touch surfaces regularly.	L
6. Ventilation	Failure to apply controls measures and prevent spread of communicable disease due to poor air circulation.	M	- Increase airflow and avoid recircualtion by opening windows, purge indoor areas frequently, and increase air filtration (i.e. buildings, vehicles, site trailers, etc.)	L
7. Physical distancing	Failure to apply control measures and prevent spread of communicable disease due to close contact	M	• Recommend and encourage employees to avoid crowded areas. • Try to maintain 6 feet / 2 meters spacing. Consider installation of barriers if risk level is high or space is limited. - If a crowded area is not avoidable (physical distancing not possible), a face covering is recommended (refer to 'Mask Use').	L
8. Mask Use	Failure to apply control measures and prevent spread of communicable disease due to close contact	M	• Mask use is not required except in accordance with any jurisdictional or site requirements. • Mask use is recommended when in enclosed and crowded spaces. - If a close contact within the last 10 days and past minimum quarantine requirements, wear a surgical grade mask or above.	L
9. Mental Health Stress, Fear, Anxiety	**Unexpected Reactions** • Anger • Violence • Breakdown	M	• Understand that all people are individuals and we all react differently to situations of high stress and change to normal routine in our lives. • Watch out for each other's wellbeing. • Don't be a downer affecting morale - keep a good attitude and stay positive to encourage a positive atmosphere at home and work. • Think before you speak – don't spread false news or gossip; stick to the facts. • If you are feeling stress/anxiety that overwhelms you, seek out assistance (e.g., Employee Assistance Program (EAP)). • Be prepared for an unexpected reaction to a comment or interaction. - Protect yourself and others but be respectful of peoples choices (e.g., to be vaccinated, etc.)	L

AHA – Communicable Disease Prevention

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

		SIGNED:	DATE:
NAME(S):			
SITE SUPERVISOR:		SIGNED:	DATE:

BY SIGNING – You Acknowledge that:

- I have read and understand all job steps, hazards and controls associated with today's work.
- Further, I WILL stop any job I think is unsafe.
- I have completed a site-specific HASP Orientation
- I have participated in a daily tailgate safety meeting

For tasks/activities that extend beyond a single day, use DAILY RENEWAL form or Point of Work Risk Assessment (PoWRa).

AHA – Communicable Disease Prevention

AHA DAILY RENEWAL		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:	Weather:	
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

AHA – Monitoring Well Installation

Activity/Work Task:	**Monitoring Well Installation and Abandonment**	Overall Risk Assessment Code (RAC-Residual) Use highest code:	**M**
Project Location:	**Anacortes, WA**		
Contract Number:	**US0041081.0037-US-Whitmarsh Landfill**		
Date Prepared:	**10/16/2025**		
Date Accepted:			
Prepared by (Name/Title):	**Kyle Hanley, Environmental Scientist**		
Reviewed by (Name/Title):			

Risk Assessment Code (RAC) Matrix

Severity \ Probability	Almost certain	Likely	Possible	Unlikely	Rare
Catastrophic	E	E	E	H	M
Major	E	H	H	M	L
Serious	H	H	M	L	VL
Minor	M	M	L	L	VL
Negligible	L	VL	VL	VL	VL

Notes: (Field Notes, Review Comments, etc.)

This AHA involves the following:•Establishing site specific measures for the specified activity
•BOLD hazards corresponding to Substantial or High Risk.

Establishing site specific measures for Monitoring Well Installation - this AHA is to be used in conjunction with the Utility Clear and and Drilling Operations and Drilling Oversight AHAs.

This AHA is not an exhaustive summary of all hazards associated with the Site. Refer to the site HASP for additional requirements. Contractor to follow general site safety controls for Slips Trips and Falls, Biological hazards, cuts lacerations and pinch points, and emergency procedures.

Step 1: Review each "Hazard" to identify Probability and Severity (Refer to Risk Register)

"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Almost certain, Likely, Possible, Unlikely, Rare.

"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Major, Serious, Minor or Negligible

Step 2: Identify the RAC-Inherent as E, H, M, L or VL for each "Hazard" on AHA, **before controls are applied.**

Step 3: Identify the RAC-Residual as E, H, M, L or VL for each "Hazard" on AHA, **after controls are applied.**

Step 4: Annotate the overall highest RAC-Residual at the top of AHA.

E = Extremely High Risk

H = High Risk

M = Moderate Risk

L = Low Risk

VL = Very Low Risk

MANAGEMENT OF CHANGE: If there is a change or deviation from the planned activity, you must stop the job and re-evaluate the risk assessment and the precautions taken. Any changes to work described in this AHA shall require review by a Qualified Person.

Check all Life Saving Rules that apply:

- ☑ Plant/People Interaction
- ☑ Lone or Remote work
- ☑ Driving
- ☑ Energy Sources
- ☑ Hazardous Substances
- ☐ Suspended Loads
- ☐ Working On or Near Water
- ☑ Ground Stability
- ☐ Working at Height

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
1. Clearing Utilities Prior to Monitoring Well Installation	1A) Utility Strikes can cause physical or environmental hazards.	H	~ Follow the utility clearance procedures in the Utility Clearance AHA and the WSP Overhead and Underground Utilities SA 313 prior to beginning any drilling activities. ~ Provide sufficient time and budget to ensure that utilities have been adequately located, prior to the start of work. ~ Subcontractor to contract Dig Safe / One call Utility identifier organization at least 6 days prior to the project start date ~ Cite or have subcontractor cite a start date of at least 3 working days prior to actual planned start date (provides window to inspect locations prior to job start-up). ~ Document all phone communications with driller about utility clearance issues and requests on the Utility Clearance Form. ~ Call any member utilities that have not responded indicating they have cleared or marked-out utilities and document the phone conversations on the Utility Clearance Form. ~ Walk all planned locations with the subcontractor, prior to start of excavation/drilling to identify marked utilities and note any uncertainties. Field Lead should call PM and relay any issues. Document this inspection in the field book and on the Utility Clearance From. Noe the subcontractor's responses to any WSP concerns. ~ If live utilities are known to be present near drilling location, if possible, move drilling to another location. ~ Use non-destructive means to drill until safe to proceed.	M
2.Subcontractor Drill Rig mobilization and downhole equipment operations and monitoring well construction - with WSP observation and documentation of monitoring well installation and abandonment by the contractor.	2A) Struck by, swing radius, or collision hazards.	H	~ Equipment operated near energized power lines must maintain th appropriate distances as specified by regulations, client requirements, and based on power rating of lines. ~ Operators should be qualified for the equipment in use. ~ Drivers shall conduct a pre-operation equipment safety check. ~ Establish communication protocols with drill crew. ~Be aware of location of stop switches. Verify that all employees know the location of all emergency stop switches, and that the emergency stop switches are active and working properly. ~ Stay clear of drill rig and equipment, but within line-of-sight of drill operator and other crew members. ~ Be attentive during drilling. Personnel should position themselves such that, in the event of equipment failure, they can quickly remove themselves from harm's way. ~ Park company vehicles and unused equipment outside of the work zone. ~ If a skid steer or ancillary equipment is being used to handle cuttings, develop a path for the equipment and keep the path clear of employees and objects. Maintain line of sight for all moving equipment. ~ Do not leave the equipment running while unattended.	M

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2B) Working around heavy machinery	H	~ Maintain a safe distance while machinery is in operation. Be aware of swing radius, lines under tension, and movement of the equipment. ~ Maintain line-of-sight of drill operator and other crew members. ~ Receive affirmative operator approval, and ensure equipment is stationary and not in operation prior to approaching the equipment. ~ Hearing protection may be required if exposed to machinery for extended periods of time. ~ Maintain proper positioning while around the drill rig in the established exclusion zone. Never walk behind the equipment, or between the equipment and a stationary object. ~ Remain alert at all times; listen and identify backup alarms, periodically scan the area for moving equipment	M
	2C) Material under stress and suspended loads can cause crush, energy release, or strike hazards.	H	~ Before use, inspect cable, chain or wire for wear and replace if necessary. ~ Observe OSHA guidelines for use of cable clamps, safety latches, chains and slings. ~ Know rated capacity of chain, cable or wire rope being used and never exceed the rating. ~ Avoid overloading and sudden jerks. ~ Check loads to be lifted for balance and have the rigging inspected to ensure a safe and balanced condition exists. ~ Do not allow employees to stand or work under suspended loads. ~ Awkward loads shall have taglines attached to control the load. ~ Review signals and operator communications with crew. Only one person shall direct the operator.	M
	2D) Moving parts may cause hazards to employees or operators.	H	~Maintain distance from moving parts. ~ If working with tooling is required during downhole operations (handling augers, adding more rods, etc.), verify all parts have come to a stop before handing them. Have the operator keep good communication and line of sight with the crew during any tooling handling operations. ~ Be aware of hand placement and maintain awareness of equipment operations. Only employees or operators should be near the equipment while it is in operation. ~ Avoid loose clothing, jewelry, and hair as they may be caught in moving parts.	M
	2E) Stabilize the equipment with hydraulic jacks/pads to prevent a possible crushing hazard.	M	~ Ensure jack is rated for weight/operation with safe limits. ~ Assure that area is clear of personnel and obstacles. ~ Place pads under jacks to prevent them from sinking into the ground.	L
	2F) Mounting and dismounting the equipment.	M	~When mounting and dismounting equipment, use steps and handhold. Do not jump from vehicle. ~ Use 3 points of contact while mounting or dismounting equipment. ~ Verify that footwear has proper traction and that the equipment is dry when possible.	L

AHA – Monitoring Well Installation

Job Steps	Hazards	RAC Inherent	Controls	RAC Residual
	2G) Sharp edges, tools, or equipment may cause injury.	M	~ Be aware of hand and body placement while the equipment is in operation. ~ Check that tools are sound and only use the proper tool for the job. ~ Wear PPE (scratch and pierce resistant gloves, hard hat, steel toe boots, pants).	L
	2H) Hearing or Eye Damage.	M	~ Maintain a safe working distance from the equipment that is out of reach of potential splash or spray, and to help reduce the decibel level. ~ Wear appropriate PPE (safety glasses or goggles if there is a splash hazard, hearing protection). Multiple types of hearing protection may be necessary depending on the decibel level. ~ Setup away from noisy operations. Don't be near the rig when hammering. Wear hearing protection during drilling activities. ~ Follow procedures outlined in the WSP Hearing Conservation Program (HS-EE-PRO-SA216)	L
3. Handling drill cores, sleeves, and soil bags or cuttings.	3A) Exposure to contaminants	M	~ During drilling operations, always be aware of the possibility of encountering potentially hazardous materials, such as Site-related contaminants in soil or groundwater (herbicides, pesticides, chemical manufacturing by-products or solid waste materials). ~ Perform air monitoring, as outlined in the HASP, to monitor for potential airborne exposures to Site-related contaminants. ~ Wear appropriate PPE (chemical resistant gloves, safety glasses or goggles). ~ Use the proper tools for handing cuttings, or splitting bags, liners, spoons or any other tools use for inspecting the soil core. ~ Apply appropriate labels to any waste storage container.	L
	3B) Lifting may cause back or knee strain. There is an increased risk of slips, trips, and falls while lifting.	M	~ Do not lift objects more than 40lbs alone. If an object is too heavy to lift alone (i.e., drums, materials, tooling, coolers) use equipment, multiple employees, or move in smaller sections. ~ Lift with the legs and not the back. ~ Make sure to keep good housekeeping and to have good footing when living or moving objects. Lines, extension cords, and tools may become trip hazards. ~ Use the appropriate tool for the task to reduce strain. ~ Whenever possible, repetitive tasks should be combined with non-repetitive tasks.	L

AHA – Monitoring Well Installation

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
PPE: Minimum PPE Requirements: Safety Glasses, Leather Work Boots with Nonslick Soles and 8-inch ankle support, Long-Sleeve Work Clothes and Pants, Reflective Vest.	**Competent / Qualified Personnel:** Name – Position/Employer Koorus Tahghighi - Assistant Vice President, Civil Engineering/Project Manager/WSP Kyle Hanley - Field Lead/WSP **Training requirements:** List specific certification (as applicable) 40-Hour HAZWOPER Site Specific HASP Orientation Toolbox safety meeting Task kick-off meeting	Inspect all PPE prior to use Daily inspection of equipment per manufacturer's instructions. Tag tools that are defective and remove from service.

AHA – Monitoring Well Installation

FIELD ACKNOWLEDGEMENT OF PERSON(S) CARRYING OUT WORK

NAME(S):		SIGNED:		DATE:	
SITE SUPERVISOR:		SIGNED:		DATE:	

Note: For tasks/activities that extend beyond a single day, use attached DAILY RENEWAL form or FLRA.

AHA – Monitoring Well Installation

AHA DAILY RENEWAL

Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		
Date:		Weather:
Changes noted:		
Site Supervisor (Print & Sign):		
Name(s):		

APPENDIX C

SAFETY DATA SHEETS

APPENDIX D

INCIDENT REPORTING

E&E Incident flow chart

If there is a life threatening injury, immediately call 911

For non-emergency work related injuries and illnesses such as sprains, strains, minor cuts and abrasions, follow the steps below:

Step 1:	Incident: notify Supervisors / Project Manager / HSE Manager within two hours of incident	Step 4:	Self-care / first-aid or referral
Step 2:	Call WorkCare within one hour of the incident (844) 268-1852 and before receiving any treatment	Step 5:	Recovery and return to work
Step 3:	Receive confidential care guidance from WorkCare	Step 6:	Enter incident into iSMS within 24 hours

WorkCare™
WORK MATTERS. HEALTH COUNTS.
(844) 268-1852

Enter all incidents into iSMS within 24hours

https://zeroharm.wspis.com/fieldforms

Download on the App Store

Get it on Google Play

Safety Manager Name/E-Mail	Earth & Environment Region	Contact Information
Jonathan Olsen jonathan.olsen@wsp.com	E&E USA	(512) 987-6209 (cell)
Greg Ertel gregory.ertel@wsp.com	Applied Solutions, Mining (interim)	(585) 465-0557 (cell)
Don Semon don.semon@wsp.com	Oil & Gas	(718) 496.83.21 (cell)
Kevin Dunsmore kevin.dunsmore@wsp.com	Southeast, Mid-Atlantic, CRS	(856) 373-6576 (cell)
Jeff Tweeddale jeff.tweeddale@wsp.com	Northeast, Midwest	(860) 805-5883 (cell)
Tré Wilson trevon.wilson@wsp.com	Mountain Pacific, California, Texas/Louisiana, Mining (interim)	(316) 202-9030 (cell)
Tom Bemrich Tom.Bemrich@wsp.com	Radiation Safety	(602) 315-2647 (cell)
Zach Manthey Zach.Manthey@wsp.com	Lab Safety	(602) 616-7703 (cell)

Incidents requiring reporting include, but not limited to: injuries, illnesses, near misses, observed hazards, positive observations, workplace violence / harassment, security incidents, subcontractor incidents, regulatory inspections, spills, and property damage. The Supervisor/PM is responsible for Local/Client Notifications and Drug/Alcohol Testing coordination as per client requirements.

APPENDIX E

INTRODUCTION TO WSP HEALTH, SAFETY AND ENVIRONMENT MANAGEMENT SYSTEMS

1 OVERVIEW OF THE WSP HSE MANAGEMENT SYSTEM

1.1 WSP OVERARCHING REQUIREMENTS

- To be competent, authorised, and physically and mentally fit.
- To conduct a pre-job risk assessment, and establish appropriate mitigating measures.
- To wear suitable PPE.
- To stop work and re-assess the risk before proceeding when there is a change.
- To have a suitable emergency response plan in place.
- To have equipment and tools available, fit for purpose, and in working condition.
- Obligation and authority to stop unsafe work.

1.2 STOP WORK AUTHORITY

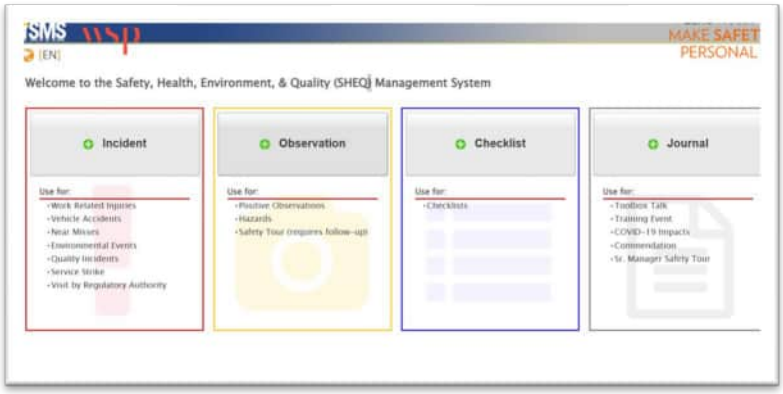
All workers have Stop Work Authority. If work assigned or observed is deemed to be unsafe, they should stop work and notify their supervisor.

1.3 WSP HSE MANAGEMENT SYSTEM MANUAL AND INJURY AND ILLNESS PREVENTION PLAN (IIPP)

The WSP Health, Safety, Security and Environment (HSE) Global Health, Safety, Environment and Quality Management System Manual describes the HSE system and tools developed & implemented at WSP. The manual addresses HSE requirements for offices, laboratories and projects, including those of various duration, scale, location, and jurisdiction. A copy of the HSEQ Manual Manual can be found here: (LINK)

1.4 ISMS

E&I uses WSP's iSMS system to report incidents and observations. iSMS takes the place of CAIRS (Incident Reporting) and HEART (Observation Reporting).



1.5 HSEQ VISION AND VALUES

Our HSEQ Vision and Values are a commitment shared by WSP and all employees to consider and effectively reduce or mitigate health, safety and wellbeing risks from our activities.

Our goal is to ensure that our activities result in:



By Actively Caring for your personal safety, and for those around you, we can prevent accidents and injury.

WSP Nine Life Saving Actions



PLANT/PEOPLE INTERFACE

I will

- Position myself to be visible to the equipment operator and to avoid interactions with moving equipment.
- Establish and obey signage, pedestrian paths, barriers and exclusion zones.
- Obtain authorisation from the equipment operator prior to entering the zone of influence of mobile plant/equipment.



DRIVING

I will

- Only use a vehicle that is fit for purpose and checked prior to use.
- Drive at a speed appropriate to the conditions and adhere to the road rules.
- Not use personal devices while driving except for hands-free navigation.
- Plan my journey to include regular breaks and fatigue checks.



SUSPENDED LOADS

I will

- Confirm that the equipment and load have been inspected and are fit for purpose.
- Establish and obey barriers and exclusion zones.
- Observe the instructions given by the rigger/signaler.
- Not place myself under a suspended load.



HAZARDOUS ATMOSPHERES / SUBSTANCES

I will

- Identify and control exposure to hazardous substances/atmospheres before starting work.
- Understand and follow the required procedures for entering a confined/restricted space.
- Test and monitor the atmosphere before entering and during work.
- Establish a rescue plan before entering a confined/restricted space.



WORKING ON OR NEAR WATER

I will

- Assess the weather and environmental conditions when working on or near water.
- Not work alone from a vessel or near fast-flowing or cold water.
- Wear appropriate Personal Flotation Devices where required.
- Establish a rescue plan before working on or near water.



LONE OR REMOTE WORK

I will

- Carry reliable means of communication for check-ins and emergency calls.
- Establish a communication plan with reporting times and escalation procedures.
- Develop and test an emergency response and rescue plan.
- Have appropriate survival gear and training including first aid.



GROUND STABILITY

I will

- Visually inspect all excavations, ground structures and ground support prior to working.
- Not enter areas of unsupported ground without appropriate ground stability measures in place.
- Place equipment and spoil at a safe distance from excavations.



ENERGY SOURCES

I will

- Identify all energy sources before work begins.
- Confirm that energy sources have been isolated and verify zero energy prior to undertaking work.
- Locate and control all buried and overhead services before starting work.



WORKING AT HEIGHTS

I will

- Implement appropriate fall prevention/protection measures when exposed to a fall from heights.
- Establish a rescue plan before commencing work at heights.
- Only work from or operate a mobile elevated work platform (MEWP) if trained, competent and authorised to do so.

APPENDIX B

FIELD FORMS

PROJECT NAME _____ **PROJECT NUMBER** _____ **BORING NUMBER** 1

CLIENT _____ **PROJECT LOCATION** _____

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR _____ **DRILL RIG** _____ **SPT HAMMER EFFICIENCY** _____

DRILLING METHOD _____ **STATION (FT)** _____ **OFFSET (FT)** _____

LOGGED BY _____ **CHECKED BY** _____ **NORTHING** _____ **EASTING** _____

NOTES _____ **GW LEVEL (ATD)** _____

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 PL MC LL 20 40 60 80 ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
0						
5						
10						
15						
20						
25						
30						
35						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

(Continued Next Page)

PROJECT NAME _____ **PROJECT NUMBER** _____ **BORING NUMBER** 1

CLIENT _____ **PROJECT LOCATION** _____

ELEVATION (ft) DEPTH	GRAPHIC LOG	SOIL & ROCK DESCRIPTION	RECOVERY % (RQD)	SAMPLE TYPE NUMBER	▲ SPT N VALUE ▲ 20 40 60 80 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80	TESTS AND REMARKS
35						
40						
45						
50						

WSDOT GEOTECH DRILLING - I405 WSDOT.GDT - 5/27/21 14:59 - C:\USERS\CHELSEA.FOSTER\DESKTOP\FIELD STAFF FILES\GINT STD US.GPJ

MONITORING WELL AS-BUILT REPORT

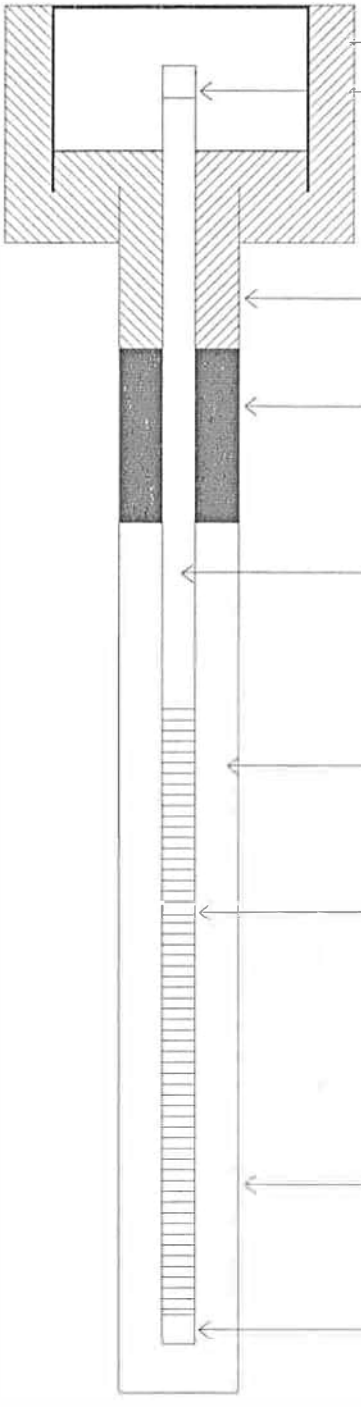
PROJECT No. _____

LOCATION _____ PROJECT NAME _____

OBSERVED BY _____ BORING/WELL I.D. _____

DRILLER/INSTALLER _____ DATE _____

SOIL TYPE **DEPTH**



ABOVE GROUND RISER HEIGHT (IF APPLICABLE) _____

MONUMENT TYPE (IF APPLICABLE) _____

WELL CAP TYPE _____

GROUT TYPE / # SACKS _____

BENTONITE SEAL / # SACKS _____

WELL CASING I.D. _____

TYPE OF CASING _____

TYPE OF CONNECTION _____

FILTER PACK/SIZE/ # SACKS _____

WELL SCREEN I.D. _____

TYPE OF SCREEN _____

SLOT SIZE _____

DIAMETER OF BOREHOLE _____

ENDCAP TYPE _____

REMARKS _____