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March 26, 2024
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Reference: ExxonMobil ADC Engineering Design Report
ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Ecology Facility Site ID 2728

Mr. Cook,

At the request of ExxonMobil Environmental and Property Solutions, on behalf of ExxonMobil Oil Corporation (ExxonMobil) and American Distributing Company (ADC), Stantec Consulting Services Inc. (Stantec) conducts environmental activities at the ExxonMobil ADC site (Site) located in Everett, Washington. Stantec prepared the enclosed *ExxonMobil ADC Engineering Design Report*, dated March 26, 2024. The purpose of this report is to describe the proposed remedial excavation to be conducted in accordance with Stantec's *ExxonMobil ADC Cleanup Action Plan*, dated March 26, 2024¹.

Site Identification

Consent Decree No. 24-2-01561-31
Facility Site ID No. 2728
Cleanup Site ID No. 5182

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¹ Stantec Consulting Services Inc. (Stantec). March 26, 2024. *ExxonMobil Cleanup Action Plan*, ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, Washington, Ecology Facility Site ID 2728

EXXONMOBIL ADC ENGINEERING DESIGN REPORT

ExxonMobil ADC

March 26, 2024

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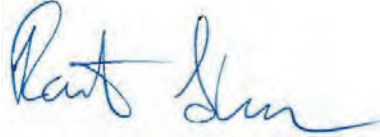
Regards,

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Attachment: Stantec's *ExxonMobil ADC Engineering Design Report*, dated March 26, 2024

c. w/ attachment

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Mr. Jeff Johnson, ExxonMobil Environmental and Property Solutions Company (*Project file*)





ExxonMobil ADC Engineering Design Report

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Ecology Facility Site ID 2728

March 26, 2024

Prepared for:

ExxonMobil Environmental and Property
Solutions Company and American Distributing
Company

Prepared by:

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File: 203722941.R19



EXXONMOBIL ADC ENGINEERING DESIGN REPORT

ExxonMobil ADC

March 26, 2024

This document entitled *ExxonMobil ADC Engineering Design Report* was prepared by Stantec Consulting Services Inc. (Stantec) for the account of ExxonMobil Environmental and Property Solutions Company and American Distributing Company (Clients). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Clients. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

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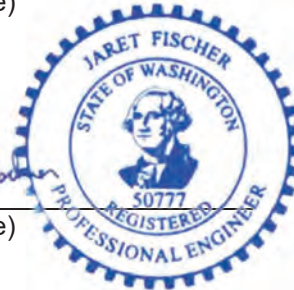


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Acronyms and Abbreviations

1996 Order	Agreed Order DE 95TC-N402
1998 Order	Agreed Order DE 98TCP-N223
2010 Order	Agreed Order DE 6184
AASHTO	American Association of State Highway and Transportation Officials)
AC	Asphalt concrete
ADC	American Distributing Company
AST	Aboveground storage tank
bgs	Below ground surface
BMPs	Best management practices
BNSF	BNSF Railway Company
CAP	Cleanup Action Plan
Cascade	Cascade Technical Services
CFR	Code of Federal Regulations
COCs	Contaminants of concern
Contractor	Stantec's selected prime contractor
cPAH	Carcinogenic polycyclic aromatic hydrocarbon
CSO	Combined sewer overflow
Discharge Authorization	City of Everett Discharge Authorization No. MD-56-2023
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
ESR	Everett Ship Repair
Excavation Delineation Work	2021 delineation soil borings to predefine the extents of the remedial excavations on and near the ExxonMobil ADC Property
ExxonMobil	ExxonMobil Oil Corporation
FFS	Focused Feasibility Study
GPS	Global positioning system
HASP	Health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDPE	High density polyethylene
HMA	Hot mix asphalt
ISS	In-situ soil stabilization
kVA	Kilo-volt-amperes
LNAPL	Light non-aqueous phase liquid
LPS	ExxonMobil Loss Prevention System
mg/kg	Milligrams per kilogram
MIDP	Monitoring and Inadvertent Discovery Plan
Miller	Mr. Aven P. Miller (former ADC property owner)
MNA	Monitored natural attenuation
Mobil	Mobil Oil Corporation
MTCA	Model Toxics Control Act



EXXONMOBIL ADC ENGINEERING DESIGN REPORT

ExxonMobil ADC

March 26, 2024

ORP	Oxygen reduction potential
OSHA	Occupational Safety and Health Administration
Plans	Construction drawings for the ExxonMobil ADC Property excavation
Port	Port of Everett
Port Interim Action	Interim action conducted on Port of Everett property to the west of the ExxonMobil Property in accordance with the June 2022 amendment to the 2010 Agreed Order
PPE	Personal protective equipment
Property	ExxonMobil and ADC-owned parcels located at 2717 and 2731 Federal Avenue, in Everett, Washington
RZA	Rittenhouse-Zeman & Associates, Inc.
SC/FFS	Site characterization/focused feasibility study
SEPA	Washington State Environmental Policy Act
Site	ExxonMobil and ADC Property and the surrounding parcels where hydrocarbons have migrated
Standard Specifications	WSDOT's <i>Specifications for Road, Bridge, and Municipal Construction 2022</i> , dated January 2022
Stantec	Stantec Consulting Services Inc.
SWPPP	Stormwater Pollution Prevention Plan
TEE	Terrestrial Ecological Evaluation
TESC	Temporary Erosion and Sediment Control
TPHd	Total petroleum hydrocarbons as diesel
TPHg	Total petroleum hydrocarbons as gasoline
TPHmo	Total petroleum hydrocarbons as motor oil
WAC	Washington Administrative Code
WISAARD	Washington Department of Archaeology and Historic Preservation
Wood	Wood Environment & Infrastructure Solutions, Inc.
WSDOT	Washington State Department of Transportation
WSP	WSP USA Environment & Infrastructure Inc.



1.0 INTRODUCTION

At the request of ExxonMobil Environmental and Property Solutions, on behalf of ExxonMobil Oil Corporation (ExxonMobil) and American Distributing Company (ADC), Stantec Consulting Services Inc. (Stantec) prepared this *ExxonMobil ADC Engineering Design Report*, dated February 16, 2024, for the ExxonMobil ADC Site (Site) located in Everett, Snohomish County, Washington (Plates 1 and 2).

Historical releases of hydrocarbons to soil and groundwater at the Site (Plate 3) were related to the former operation of bulk storage, transfer, and distribution of petroleum and petroleum related products. Light non-aqueous phase liquid (LNAPL) has been observed in soil and groundwater beneath the Site (including on neighboring properties). The ExxonMobil ADC Site is defined as the ExxonMobil and American owned properties (Property) and the surrounding rights-of-way and properties that were affected by the migration of hydrocarbons in soil and groundwater. Snohomish County parcels that comprise the Site are shown in Figure 1.

Figure 1 Snohomish County Parcels that Comprise the Site

Property Description	Property Owner	Location	Tax Parcel Description
ADC	ADC	Northern portion of Property	00437161900101 00437161900100
ExxonMobil	ExxonMobil	Southern portion of Property	00437161901000
City of Everett Right-of-Way	City of Everett	East and south of Property	Right-of-way
Former Everett Avenue	Port	North of Property	00597761803901
Federal Avenue	City of Everett	West of Property	Right-of-way
BNSF	BNSF parcel	East of Property	00437161901702
BNSF Easement	City of Everett	East of Property	Right-of-way
Terminal Avenue Overpass	City of Everett	East and south of Property	00437161901801 00437161901400
Port properties	Port	West and north of Property	29051900301600 29051900302500 29051900302700 29051900302800 29051900302900

This Engineering Design Report (EDR) was prepared to provide relevant information in order to implement the work described in Stantec's *ExxonMobil ADC Cleanup Action Plan (CAP)*, dated March 26, 2024 (Stantec, 2024b) and satisfy the requirements of Washington Administrative Code (WAC) 173-340-400(4)(a) (WAC, 2007).

1.1 PREVIOUS STUDIES

This section briefly discusses previous investigations at the Site. Since 1985, various consultants have conducted environmental investigations to characterize the nature and extent of contaminants of



concerns in soil and groundwater at the Site. Previous investigations are summarized in Appendix A. Interim actions conducted to date are summarized in Appendix B and Sections 1.2.1 and 1.2.2 of Stantec's March 2024 CAP (Stantec, 2024b). Boring logs from 2021 excavation delineation investigations (Excavation Delineation Work) are included in Appendix C.

1.2 REGULATORY FRAMEWORK

This section summarizes the regulatory background of the Site, including the three Agreed Orders, a Consent Decree, and definition of the Model Toxics Control Act (MTCA) Site.

The cleanup of the Site is regulated under WAC Chapter 173-340 – MTCA Cleanup Regulations (WAC, 2007). Environmental site investigation and interim actions have been conducted at the Site beginning in 1985 (WSP, 2023). There have been three Agreed Orders issued under the MTCA to date that direct cleanup actions at the Site (Ecology, 2010).

Consent Decree No. 24-2-01561-31 has been prepared by Ecology, ExxonMobil, and ADC (entered by the State of Washington Snohomish County Superior Court on March 26, 2024) supersedes the 2010 Order (Ecology, 2024b). The Consent Decree builds on the work performed under the 2010 Order and authorizes performance of the Site-specific requirements for the remediation actions outlined in the *Stantec's ExxonMobil ADC Cleanup Action Plan* dated March 26, 2024 (Stantec, 2024b). The CAP defines the ExxonMobil ADC excavation of LNAPL and soil above residual LNAPL saturation remediation levels, transportation and disposal of excavated soil, excavation backfill, site restoration, soil stabilization, development of institutional controls, and development of a post remediation performance monitoring plan.

As noted in the 2024 Consent Decree, the MTCA Site is defined as a release of gasoline-, diesel-, and motor oil-range total petroleum hydrocarbons (TPHg, TPHd, TPHmo), benzene, total xylenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), 1-methylnaphthalene and lead in soil and groundwater (Ecology, 2024b). Additionally, ethylbenzene has been detected exceeding the MTCA Method A Cleanup Level in soil (Ecology, 2024b). The Site includes the ExxonMobil ADC Property and extends into former Everett Avenue, Federal Avenue, and the Port property just west of Federal Avenue. It also includes portions of the City of Everett rights-of-way to the east and south and the land underneath the Terminal Avenue Overpass to the east and southeast of the Property, and the BNSF Railway Company (BNSF) parcel east of the Property.

The ExxonMobil ADC excavation, along with long-term monitoring and implementation of institutional controls, is the final cleanup action for the Site as described in Stantec's March 2024 CAP (Stantec, 2024b).

2.0 SITE DESCRIPTION

2.1 CURRENT LAND USE

The ExxonMobil and ADC owned parcels are currently an asphalt-paved parking lot with no structures present. The Site is comprised of City of Everett rights-of-way to the west, east, and south (including the Terminal Avenue Overpass); the Port property to the west of Federal Avenue (including the active port



and the property leased and currently occupied by Everett Ship Repair [ESR]), and to the north including former Everett Avenue; and the BNSF parcel and railway corridor easement to the east of the Property.

2.2 SITE PROPERTY USE

The lateral extent of petroleum impacted soil and LNAPL beneath the Site extends onto neighboring properties to the north, south, east, and west. To the west of the Property is Federal Avenue and Port property beyond. To the east of the Property is a City of Everett right-of-way and the BNSF parcel beyond. To the east and southeast is the Terminal Avenue Overpass. To the north is former Everett Avenue, now owned by the Port. The ExxonMobil ADC Property and surrounding parcels are shown on Plate 3.

2.3 SITE HISTORY

The following is a summary of historical site development and use. Additional details regarding historical use and operations of the Property and surrounding areas are available in WSP's final draft SC/FFS (WSP, 2023).

Indigenous people historically inhabited the shoreline along Port Gardner Bay. Development of the original shoreline (near present-day Federal Avenue) began in the late 1800s and continued until 1976, when the current shoreline was established. The Property and surrounding properties were used for storage and transfer of petroleum and petroleum products as early as 1920. From the 1920s until 1990, various portions of the Site were used for bulk storage, transfer, and distribution operations; marine offloading; truck loading; and rail loading and/or unloading of petroleum products that included fuel oils, stove oil, Bunker C fuel oil, diesel, and gasoline.

Peak operations at the Site occurred from the 1920s through the early 1980s. Historical Property features included various configurations of aboveground storage tanks (ASTs), warehouse buildings, pump houses, diked fuel storage areas, a boiler room, loading racks, and overhang canopies. A detailed summary of surrounding properties and historical use and features are included in Section 2.0 of the final draft SC/FFS (WSP, 2023).

In May 1985, Rittenhouse-Zeman & Associates, Inc. (RZA), conducted an environmental investigation that indicated a release of hydrocarbons to the surface and subsurface had occurred. ExxonMobil terminated bulk fuel operations on the ExxonMobil parcel in 1987 and demolished the ASTs and other structures. By 1993, the ExxonMobil parcel had been covered with asphalt with no above-grade structures present. Operations on the ADC parcels were terminated in 1990. In 1998, all structures on the ADC parcels were demolished. In 1999, the Property was capped with asphalt to meet the requirements of the 1998 Order. Since then, the Site has been used intermittently as a parking lot by neighboring businesses and has remained unimproved with no above-grade structures (Plate 2).

3.0 SOIL REMEDIATION LEVELS

In accordance with Ecology's May 6, 2019, response (Ecology, 2019) to Wood's draft 2019 SC/FFS (Wood, 2019), Site-specific residual saturation remediation levels were selected and are summarized in Figure 2.



Figure 2 Site-Specific Residual Saturation Remediation Levels in Soil

Contaminants of Concern	Site-Specific Residual Saturation Remediation Level (milligrams per kilogram [mg/kg])
TPHg	2,470
TPHd	4,800
TPHmo	5,810

Excavation to the Site-specific residual saturation remediation levels will remove soil to the maximum extent practicable in accessible areas on and near the ExxonMobil ADC Property.

4.0 SOIL – EXCAVATION AND IN-SITU SOIL STABILIZATION

To predetermine the extents of the proposed remedial excavations, the Excavation Delineation Work was conducted at accessible areas of the Site, including on and near the ExxonMobil ADC Property.

Borings were completed in 2021 on the ExxonMobil ADC Property and the immediate surrounding areas, which included City of Everett rights-of-way (to the east, west, and south). The purpose of the borings was to predefine the extents of the LNAPL excavation areas such that performance monitoring in the form of soil sampling at the time of excavation and in-situ soil stabilization (ISS) is not necessary. Analytical results for soil samples collected during the Excavation Delineation Work are summarized in Table 1.

The extents of the ExxonMobil ADC Property excavation and ISS have been defined by the Excavation Delineation Work shown on Plates 4 through 12 and the cross section shown on Plate 13. The extents of the proposed excavation measure approximately 320 linear feet north to south along Federal Avenue and approximately 170 linear feet east to west from Federal Avenue toward the former BNSF excavation. The overall surface area of the excavation will measure approximately 47,000 square feet.

The proposed depth of excavation at the ExxonMobil ADC Property gradually decreases from north to south. The excavation on the southwestern portion of the ExxonMobil ADC Property will be advanced to 7.5 feet below ground surface (bgs) where soil less than the Site-specific residual saturation remediation levels was observed (Plates 4 through 13). Progressing northeast, and to remove soil greater than the Site-specific residual saturation remediation levels, the proposed excavation depths gradually increase from 10 to 12.5 feet bgs and then to 15 feet bgs (Plates 7, 8, and 9). With each step-in depth, the surface width of the excavation becomes smaller. In addition to the excavations (7.5, 10, 12.5, and 15 feet bgs excavations), ISS will be used at a smaller area between 15 and 20 feet bgs to remediate soil greater than the Site-specific residual saturation remediation levels on the eastern portion of the Site (Plate 11). ISS is being implemented as an alternative to source removal at depths greater than 15-feet below ground to minimize the impact to adjacent infrastructure. Source removal at the greater depths would significantly increase the measures needed to be taken to be protective of the structural integrity of the nearby Terminal Avenue Overpass. Engineering design drawings of Terminal Avenue Overpass were reviewed by geotechnical and structural engineers who confirmed that installation of sheet pile shoring for excavation less than 15-feet bgs, and ISS for greater depths, would be protective of the Terminal Avenue Overpass, while still meeting the remedial objective for this area. Due to soil encountered greater than the



Site-specific residual saturation remediation levels in the northwest corner of the Property, excavation will be advanced to 15 feet bgs (Plate 9).

The excavation extents were established to remove accessible soils containing LNAPL and soil where analytical results exceeded the Site-specific residual saturation remediation levels and remediate with ISS where excavation is not feasible. Performance monitoring in the form of soil sampling will not be necessary at the time of excavation or ISS, as the extent of excavation necessary to attain remediation levels has been identified by the Excavation Delineation Work. Delineation activities are summarized in Stantec's *Site Characterization/Focused Feasibility Study Addendum*, dated March 26, 2024 (Stantec, 2024a).

Performance monitoring will include documentation of achieving vertical and lateral extent of the planned excavation limits. This documentation will use a combination of surveying, global positioning system (GPS)-enabled excavation equipment, and field measurements (Section 6.7.4).

5.0 APPLICABLE, RELEVANT, AND APPROPRIATE REQUIREMENTS

Section 173-340-710 of the WAC states that the selected cleanup action must comply with various federal and state level regulatory requirements (WAC, 2007). Some requirements will be refined during the design process and will be summarized in other supporting documents. As discussed in the CAP (Stantec, 2024b), the following regulatory requirements are applicable to the selected cleanup action:

- Native American Graves Protection and Repatriation Act (Sections 5.1 and 5.2).
- Archaeological Resources Protection Act (Sections 5.1 and 5.2).
- State Environmental Policy Act (Section 5.3).
- Public Works Permits (Section 6.2).
- Washington State and Federal Worker Safety (Section 6.3).
- Air Quality (Sections 6.3.3).
- National Recommended Water Quality Criteria (6.4.4).
- Washington Dangerous Waste Regulations (Section 7.0).
- Washington Solid Waste Handling Standards (Section 7.0).
- Federal Waste Transportation Standards (Section 7.0).

5.1 CULTURAL RESOURCE BACKGROUND REVIEW

A literature search of previously recorded cultural resources for the Site and surrounding area was conducted (Appendix E; Cardno, 2021b). This included a thorough review of existing cultural resource data (i.e., archaeological, ethnohistoric, and historic) and previously completed cultural resources surveys. Information from the following sources were reviewed:

- Washington Department of Archaeology and Historic Preservation (WISAARD).
 - Washington Information System for Architectural and Archaeological Records Data.
 - Previous regional cultural resource investigations.
 - Previously recorded cultural resources.
- Historical registers (National Register of Historic Places).



- Local libraries and historical societies (if accessible).
 - Secondary sources, newspapers, historical documents, maps, photographs, and interviews.
- Tax assessor data.
- Site-specific data (including project plans provided by ExxonMobil).

The background data was compared to the proposed cleanup action to determine any potential disturbance to previously recorded archaeological resources, and to assess the archaeological significance of the project area. A project number within the WISAARD database will be initiated, as appropriate.

5.2 MONITORING AND INADVERTENT DISCOVERY PLAN

A Monitoring and Inadvertent Discovery Plan (MIDP) has been prepared for the Site (Cardno, 2022a). The MIDP (Appendix F) contains a project description, pertinent cultural resources laws and regulations, protocols for a preconstruction meeting and archaeological monitoring by a professional archaeologist, maps depicting the monitoring locations, email updates to the applicable agencies and tribes, and relevant contact information.

5.3 WASHINGTON STATE ENVIRONMENTAL POLICY ACT REVIEW

In accordance with Washington State Environmental Policy Act (SEPA), a revised SEPA checklist was prepared for the Site (Stantec, 2023). The revised SEPA checklist, included as Appendix G, identifies measures to avoid, counter, or minimize likely impacts to the environment. On January 2, 2024, Ecology issued a Determination of Non-Significance (Ecology, 2024a) for the cleanup action.

5.4 TERRESTRIAL ECOLOGICAL EVALUATION

No wetlands, streams, shorelines, floodplains, or wildlife habitat are present on the Site (US FWS, 2021; WSP, 2023). As summarized in the SC/FFS, soil concentrations are considered protective of terrestrial receptors via a simplified Terrestrial Ecological Evaluation (TEE). The Site meets the requirements for an exclusion from performing a TEE (Appendix H) as outlined in WAC 173-340-7492 (WAC, 2007).

Groundwater performance sampling will continue until cleanup standards are achieved and confirmational monitoring is implemented.

6.0 CLEANUP ACTION ENGINEERING DESIGN AND PROCEDURES

This section summarizes the engineering design and procedures that will be used to complete the cleanup action outlined in Stantec's CAP (Stantec, 2024b). The engineering design and procedures have been derived from the proposal package submitted by Stantec's selected prime contractor (Contractor), Stantec's CAP (Stantec, 2024b), and from correspondence between Stantec, the Contractor, and various public agencies during the preplanning phase of the project. The cleanup action will be implemented as defined on Stantec's construction drawings for the ExxonMobil ADC Property excavation (Plans) included as Appendix I.



6.1 PRE-PROJECT PLANNING AND DOCUMENT PREPARATION

6.1.1 6.1.1 Utility Protection Plan

Available utility maps will be reviewed, and a private utility locating service will be deployed to assess for the presence and locations of underground utilities. The Contractor will verify the depths and alignments of any marked utilities that interfere with the excavation and/or shoring using soft digging methods and a vacuum truck. All potholes will be backfilled or covered with traffic-rated steel plates. Additionally, the Contractor will subcontract a licensed surveyor to mark out all known utility alignments.

6.1.2 Stormwater Pollution Prevention Plan and Temporary Erosion and Sediment Control Plan

Stantec prepared a Stormwater Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) Plan, enclosed as Appendix J. The Contractor shall adhere to the best management practices (BMPs) outlined in the SWPPP and TESC. The SWPPP and TESC specify the BMPs to:

- Reduce, eliminate, or prevent stormwater contamination and water pollution during the remedial excavation.
- Prevent violations of surface water quality, groundwater quality, or sediment management standards.
- Control peak volumetric flow rates and velocities of stormwater discharges.

6.2 PERMITS

This section summarizes permits required to complete the work outlined herein.

6.2.1 City of Everett Permitting Under the MTCA

Since the remedial action is being driven by a MTCA cleanup action, and since asphalt removal, shoring installation, excavation of contaminated soil, backfill, compaction, and resurfacing fall within the MTCA scope, traditional permits for these activities with the City of Everett will not be required.

Upon submittal of the SWPPP to the City of Everett, a Letter of Substantive Requirements will be issued in lieu of traditional construction permits. While a Letter of Substantive Requirements replaces the need for a formal permitting process, the City of Everett will review the Plans to see that all substantive requirements for the City of Everett are met.

While the previously mentioned tasks will be exempt from traditional permitting, both capping off utilities and utility reconnection will require traditional permits from the City of Everett. The Contractor will obtain the required permits for the utility work.

6.2.2 Storm Sewer Cut Cap Permit

The contractor will obtain necessary over-the-counter City of Everett permits for capping off the storm line and reinstalling the storm line after completion of the remedial excavation.



6.2.3 City of Everett Discharge Permit

On June 9, 2023, Stantec obtained Discharge Authorization No. MD-56-2023 (Discharge Authorization) from the City of Everett (Appendix K) for discharge of groundwater from excavation dewatering activities. Discharge rate limits, restrictions, and analytical are summarized on the Discharge Authorization.

6.3 HEALTH AND SAFETY

6.3.1 General Safety Requirements

All workers will possess Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste and Emergency Response (HAZWOPER) training as well as the required 8-hour yearly refresher training, ExxonMobil Loss Prevention System (LPS) training, and equipment training certifications for the equipment the workers will be operating.

All activities will be conducted under the ExxonMobil work permit system and in accordance with the ExxonMobil Minimum Safety Expectations and Life Saving Actions. The ExxonMobil Work Permit system includes particular focus on the following high-risk activities and their associated High Risk Checklists:

- Working Near Moving Equipment
- Working at Heights
- Hot Work
- Excavation
- Energy Isolation
- Lifting and Rigging
- Confined Space

Some tasks may require working at heights. Personnel involved in planning and working at heights must be trained and must provide competency assessment documentation or demonstrate their understanding of working at heights, with refresher training at least every 3 years. If specialized equipment is used, training must include proper use, maintenance, understanding any limitations, and inspection requirements for the equipment.

6.3.2 Health and Safety Plan

A site-specific Health and Safety Plan (HASP) has been developed for this work in accordance with OSHA 29 Code of Federal Regulations (CFR) 1910.120 – Hazardous waste operations and emergency response (OSHA, 2022), OSHA 29 CFR Part 126 – Safety and Health Regulations for Construction, and WAC 296-843 – Hazardous Waste Operations (WAC, 2007). The project HASP is included as Appendix L. The Contactor will be responsible for preparing their own site-specific HASP prior to beginning work on the Site.

6.3.3 Protection Monitoring

Protection monitoring is to protect human health and the environment during the cleanup action. Air monitoring will be conducted in accordance with Federal and state requirements, the HASP, and ExxonMobil's Work Permit system.



6.3.4 Task-Specific Hazards

Hazards associated with utility work include worker exposure to electricity, pressurized lines, and biological exposure from the sewer line. Controls will include the use of public and provide utility locates to identify subsurface structures, use of soft digging methods including air knife and vacuum truck excavation to positively identify the utility location, the use of lockout/tagout procedures for energy isolation, and personal protective equipment (PPE).

Hazards associated with the installation of shoring and remedial excavation include working with heavy equipment (excavator, crane, and drill rig), lifting and rigging, and working near rotating equipment. Significant hazards exist by being struck or crushed or striking an overhead line. Controls will include implementation of LPS, the Work Permit system including High Risk Checklists, Minimum Safety Expectations, and Life Saving Actions; delineated work zones and spotters with radio contact and air horns; and PPE.

Hazards associated with dewatering and operation of the pump and treatment system are direct contact with contaminated water and/or LNAPL, working with pressurized piping and hoses, and exposure to electricity used to power the pumps and system. Controls include the use of PPE to prevent worker exposure and use of a generator with a ground-fault circuit interrupter.

Hazards associated with restoration include backfill, paving, and compaction are working with heavy equipment and working with dangerous materials (i.e., worker exposure to dust, high temperatures, and contaminated soil and water). Significant hazards exist by being struck or crushed or striking an overhead line. Controls will include implementation of LPS, the Work Permit system including High Risk Checklists, Minimum Safety Expectations, and Life Saving Actions; delineated work zones and spotters with radio contact and air horns; and PPE.

Hazards associated with cleaning of the frac tanks, (part of the pump and treatment system), is OSHA permit-required confined space entry. Hazards include limited means of ingress and egress, potentially hazardous atmosphere, oxygen deficiency, and contact with contaminated media. Controls will include verification that the entrant(s), attendant(s), and supervisor(s) have received adequate training within the last year. Additional controls include use of the ExxonMobil work permit system including High Risk Checklists, Minimum Safety Expectations, Life Saving Actions, any other OSHA-required documentation, and PPE including respiratory protection if required.

6.4 SITE PREPARATION AND MOBILIZATION

Various activities, outlined in Sections 6.4.1 through 6.4.6, must be completed prior to remedial excavation activities on and near the ExxonMobil ADC Property to facilitate a safe and efficient project.

6.4.1 Equipment Mobilization

The Contractor will mobilize its personnel, equipment, appliances, tools, materials, and supplies, including the establishment of all offices, buildings, and other facilities necessary for the work.



6.4.2 Welfare Facility Mobilization

Climate controlled construction offices, temporary power supply, restroom and handwashing facilities, and solid waste disposal containers will be mobilized prior to commencement of excavation activities. These facilities will support the construction crew and all other contractors throughout the duration of the remedial excavation. Additionally, emergency contact signage will be installed at the entry points of the excavation and welfare facilities in the event public shall need to contact the construction manager during non-business hours when the site is not occupied.

6.4.3 Fencing Removal and Temporary Fencing Installation

Prior to initiating the remedial excavation and its associated tasks, perimeter fencing, and gates will be established to secure the work zones. The fencing, trucking routes, and work zone layout figures are shown on the Plans (Appendix I).

6.4.4 Temporary Erosion and Sediment Controls

The SWPPP and TESC plans are included in Appendix J. All BMPs outlined in the SWPPP will be implemented by the Contractor where applicable for that stage of work. As described in Section 6.2.1, the SWPPP and TESC plan will be submitted to the City of Everett for review to obtain a Letter of Substantive Requirements.

Stantec, the Contractor, and a Washington State Certified Erosion and Sediment Control Lead will perform regular inspections and maintenance to observe that BMPs are in working condition. More thorough inspections will occur following storm events. A summary of applicable construction stormwater BMPs are in the SWPPP.

In addition to the BMPs listed in the SWPPP, the Contractor will perform dust control during all phases of the excavation, soil loading, and soil transportation activities with a water truck. Haul routes will be kept clean and wetted down to reduce construction-related dust. Soil will only be loaded over visqueen sheeting to mitigate track out and dust along haul routes. While still in the loading area, and before leaving the site, trucks will have any soil on exterior surfaces removed via shovel, broom, and other hand tools as necessary. Finally, the Contractor will perform daily street sweeping on soil load out days and reduce drop heights of material when loading out soil to minimize dust.

6.4.5 Excavation Saw Cutting and Asphalt Concrete Removal

The Contractor will cut the perimeter of the asphalt concrete (AC) surface for the excavation prior to commencing the excavation. Wet saw cutting methods will be utilized to minimize dust. The waste slurry will be handled as Contractor-generated non-hazardous construction waste (Section 7.5).

Upon completion of saw cutting activities, the Contractor will demolish and remove the existing AC from the excavation surface. All broken AC will be loaded into dump trucks and hauled to Cadman's Delta Remediation landfill for disposal as Contractor-generated debris (Section 7.5).



6.4.6 Dewatering System Design and Setup

The contractor will provide basic dewatering equipment to deal with site conditions to protect the surrounding environment from impacted groundwater/sediment runoff. Groundwater removed during excavation activities will pass through filtration systems to remove dissolved-phase COCs.

Prior to discharges to the City of Everett sanitary sewer, and in accordance with the Discharge Authorization described in section 6.2.3, Stantec will collect and submit treated water samples to Eurofins Calscience, a state-certified laboratory located in Tustin, California. Per the Discharge Authorization, one sample will be collected from a representative batch of groundwater generated during dewatering activities and held in settling tanks prior to discharge. The sample will be analyzed for the following:

- Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Silver, Zinc by Method SW846 6020
- Mercury by Method SW846 7470A
- Total Cyanide by Method SM 4500
- HEM Oil and Greases by general chemistry method 1664A

All samples will be run on an expedited turnaround time and will be submitted to the City of Everett Maintenance and Operations Manager for discharge approval. Additional samples will be collected per the direction of the City of Everett as requested.

The dewatering system will be comprised of pumps to evacuate water from the excavation, conveyance piping, above ground weir tanks for the settlement of solids, mechanical filtration, and carbon filtration to ensure discharge water quality criteria is achieved as depicted on Plate 15.

6.5 UTILITY PROTECTION

A 15-inch diameter storm drain line connects four storm drains on the Property to a main line in Federal Avenue. The 15-inch storm drain line will be capped along the Property line and Federal Avenue. The four storm drains and connecting lines located within the excavation footprint will be removed for excavation and will be reinstalled upon completion of excavation activities. This utility will be disconnected and reinstalled by the Contractor.

6.6 SHORING WALLS

Shoring walls to protect adjacent infrastructure and rights-of-way will be installed per the geotechnical report, plans and specifications included in Appendix M. The shoring contractor will then begin installation of sheet piles starting at the west elevation and continue sheet pile installation working around the perimeter of the site, ending at the southwest elevation. Prior to excavation, sheet piles will be installed per the shoring design to the following approximate depths:

- Western Shoring Wall: Approximately 40 feet bgs.
- Northern Shoring Wall: Approximately 40 feet bgs west to 55 bgs feet east.
- Eastern Shoring Wall: Approximately 55 feet bgs north decreasing 45 feet bgs south.
- Southwest Shoring Wall: Approximately 45 feet bgs east decreasing 40 feet bgs west.

Any field deviations to the actual depth for which the sheets are installed will be reviewed and approved by the shoring engineer of record prior to commencing excavation activities.



Protection of the surrounding infrastructure including the Terminal Avenue Overpass and BNSF railway will be maintained via pre- and post-dilapidation surveys, civil site surveys, and vibration monitoring. The pre and post dilapidation surveys consist of photographic reports documenting the pre and post excavation work and performed by the structural engineer of record to document the condition of adjacent infrastructure. The civil surveys will be performed by a licensed surveyor to monitor sheet pile deflection and confirm the integrity of adjacent infrastructure is maintained during excavation activities as outlined in the shoring monitoring design notes.

The vibration monitoring will consist of collecting baseline vibration data via the placement of seismographs in the vicinity of Terminal Avenue Overpass and the BNSF railway. Seismographs will continuously collect data during sheet pile installation and reviewed by an acoustics and vibration expert. If pre-defined tolerances defined for the protection of the adjacent infrastructure are exceeded, work will immediately stop, and construction means and methods evaluated.

To protect the public during installation activities, traffic will be temporarily stopped on Federal Avenue while sheet piles are being lifted by the crane and set on the ground within the tip radius of the sheet.

6.7 REMEDIAL EXCAVATION AND IN-SITU SOIL STABILIZATION

6.7.1 In-situ Soil Stabilization

In-situ soil stabilization will be utilized to remediate approximately 340 yards of soil exceeding the Site-specific residual saturation remediation levels in close proximity to the Terminal Avenue Overpass (Plate 12 and Plate 13). Soil stabilization was chosen as the appropriate remedial alternative in this area to prevent damage to adjacent infrastructure. A slurry stabilization compound consisting of Portland cement and calcium chloride will be injected into the subsurface as defined by the in-situ soil stabilization plan included as (Appendix N).

6.7.2 Remedial Excavation

Following shoring installation and utility preservation, excavation will commence using mechanical excavation methods. As described in Section 6.7.5, the Contractor shall direct load or temporarily stockpile removed soil pending any drying and transport truck coordination. The excavation is expected to remove approximately 15,000 cubic yards of impacted soil.

The remedial excavation will proceed to predetermined depths and horizontal extents. Results from the Excavation Delineation Work, including the final excavation extents, are summarized in Stantec's *Site Characterization/Focused Feasibility Study Addendum*, dated March 26, 2024 (Stantec, 2024a). The excavation extents are defined on Plates 12 and 13. Excavation to these pre-determined depths will remove LNAPL and soil inferred to be greater than the Site-specific residual saturation remediation levels. Excavation extents are bound by geolocated soil borings and have been agreed upon by Ecology, ExxonMobil, and ADC. As defined in Stantec's Cleanup Action Plan, LNAPL and soil exceeding the site-specific residual saturation remediation levels will remain in areas on or near Federal Avenue, former Everett Avenue, the BNSF parcel, and the public rights-of-ways including Terminal Avenue Overpass. Source removal in these areas is not practicable due to engineering design constraints, the requirement to maintain the integrity of utility corridors, and the presence of existing infrastructure.



6.7.3 Dust and Odor Control

The Contractor will implement specified dust, odor, and emission control measures during operations to include, but not be limited to, wetting soil surfaces with water as necessary to control dust emissions, covering any soil stockpiles created that are inactive for longer than one (1) hour, and closing soil waste bins that are not being actively loaded. Water for dust suppression will be applied by a pressure-type distributor equipped with a spray system that will ensure a uniform application.

To reduce odors from excavation activities, the Contractor will use diluted Simple Green as the primary odor control agent. Simple Green is readily biodegradable, fully breaking down into natural components in a typical sanitary sewer or septic system within 6 months (Simple Green, 2022).

6.7.4 Excavation Depth Confirmation

A site survey performed by ASPI, a state-licensed surveyor, has been performed. The surveyor utilized a benchmark located at N02°00'12"E between offset monuments at the intersection Grand Avenue and Everett Avenue and the intersection of Grand Avenue and 26th Street, in Everett, Washington.

The Contractor will use Topcon GPS machine controls during the excavation correlated with the existing professional site survey. The GPS equipment is capable of executing and recording excavations to less than 0.1-foot accuracy (Appendix O). The contractor will construct a GPS model using survey data prior to starting the excavation. The Contractor will provide the GPS data from the excavation as the project progresses. The GPS data will be used to generate a topo of the as-built conditions to confirm the soil removal objectives are met.

The GPS equipped excavator is safer to use than traditional excavation survey and measurement procedures. No worker will need to go near the outside of the excavator or the excavation pit to verify that the excavation limits have been achieved.

6.7.5 Temporary Soil Stockpiling

The contractor will construct a soil stockpiling area within the ExxonMobil and ADC owned parcels. The soil stockpiling area will be established for wet soils to be staged and confirm it meets all criteria required at the disposal facility including moisture content. The stockpiling area may be moved as the excavation progresses to allow for the safe flow of on-site traffic. The soil stockpiling area will be built to slope back towards the excavation. Twenty-millimeter-thick high-density polyethylene (HDPE) will be used to line the bottom and sides of the drying cells. K-Rails or Ecology Blocks will be used to construct three sides of the drying cell. Free water will be allowed to decant back to the excavation. In accordance with the SWPPP, soil will be covered at the end of each shift with weighted 6-millimeter plastic sheeting. Absorbent materials will be used to collect any visible LNAPL in groundwater. Shallow/dry soil will be mixed with wet soil on an as needed basis to allow for truck loading. The Contractor may use shallow/dry soil to line the bottoms and back of truck beds when needed to prevent liquid spillage from trucks.

6.7.6 Excavation Dewatering

During the remedial excavation, the Contractor will perform excavation dewatering using submersible pumps. Based on the historically observed water table elevation, minimal dewatering will be required during the southern portion of the excavation. Recovered groundwater will be processed by the water



treatment system for treatment and discharge to the sanitary sewer. Prior to backfill and restoration, any LNAPL present within the excavation will be collected using absorbent material or pumped and separated from groundwater prior to treatment and transferred to a temporary storage tank pending transport for disposal (Section 7.2).

6.8 BACKFILL AND RESTORATION

Upon completion of the remedial excavation, the Contractor shall place backfill according to specifications of the Port and the Washington State Department of Transportation (WSDOT) *Standard Specifications for Road, Bridge, and Municipal Construction 2022* (WSDOT, 2022), hereinafter referred to as the Standard Specifications. The Contractor shall submit a supplier's certificate documenting compliance of each type of backfill material for approval by the Stantec engineer prior to importing material to the work site.

6.8.1 Geotextile Installation

Upon reaching the required depth within the excavation, the Plans (Appendix I, Drawing C-3) specify installation of geotextile filter fabric atop the backfill placed within the groundwater table. The purpose of the geotextile is to limit movement of fines into the voids of the backfill material below the water table. The geotextile fabric will consist of a woven material composed of a strong, rot-proof polymeric yarn or fiber orientated into a stable network that retains its relative structure during handling, placement, and long-term service. The fabric will have complete resistance to deterioration from ambient temperatures, acid, and alkaline conditions, and be indestructible to micro-organisms and insects. The fabric will be installed safely from the top of the excavation using an excavator and tag lines. Appropriate precautions will be taken when working at heights (i.e., adjacent to the excavation opening), including but not limited to fall protection equipment.

6.8.2 Backfill Below the Water Table

Material shall meet the gradation specification of Section 9-03.12(4) of the Standard Specifications or AASHTO (American Association of State Highway and Transportation Officials) No. 57. The contractor will place the backfill in conformance with the lines, grades and dimensions shown on the Plans (Appendix I, Drawing C-4). The backfill shall be deposited and spread evenly and placed in loose lifts not to exceed 12 inches in thickness. At the water table surface, the backfill shall be compacted by mechanical tamping and additional backfill deposited until tamping no longer pushes backfill below the water table surface.

6.8.3 Backfill Above the Water Table (Subbase)

The subbase backfill shall meet the gradation specification of Section 9-03.18 of the Standard Specifications for Foundation Material Class C. The Contractor shall place the backfill in conformance with the lines, grades and dimensions shown on the Plans (i.e., from the water table surface to minus 24 inches below surface grade) (Appendix I, Drawing C-3), and in accordance with the applicable provisions of the Standard Specifications, except as specified as below.

The subbase backfill shall be placed in uniform lifts not exceeding 12 inches in uncompacted thickness. Each lift of subbase backfill shall be compacted to a minimum density of 92 percent of the maximum dry density as determined by WSDOT Standard Operating Procedure 615.



Prior to placement of any subbase backfill, the Contractor shall submit the laboratory test results for the maximum dry density of a proctor sample, according to WSDOT T606 for approval by the Stantec engineer. During placement of the subbase backfill, density testing shall be performed at a minimum of one test per 200 square feet of placed material, with a minimum of four tests per lift.

6.8.4 Aggregate Base

The aggregate base shall conform to the requirements of Section 9-03.10 of the Standard Specifications. The Contractor shall place the backfill in conformance with the lines, grades and dimensions shown on the Plans (i.e., from minus 24 to minus 6 inches below surface grade), and in accordance with the applicable provisions of the Standard Specifications, except as specified below.

The aggregate base shall be placed in uniform lifts not exceeding 9 inches in uncompacted thickness. Each lift of aggregate base shall be compacted to a minimum density of 95 percent of the maximum dry density as determined by WSDOT Standard Operating Procedure 615 (WSDOT, 2022).

Prior to placement of any aggregate base for the project, the Contractor shall submit the laboratory test results for the maximum dry density of a proctor sample according to WSDOT T606 for approval by the Stantec engineer. During placement of the aggregate base, density testing shall be performed at a minimum of one test per 200 square feet of placed material, with a minimum of four tests per lift per excavation location.

6.9 UTILITY RESTORATION

During the backfill and compaction phase of the excavation, the 15-inch storm sewer will be re-installed at the same elevation/grade established prior to removal. Required inspections by the City of Everett will be performed prior to the piping and connections being covered with fill material.

6.10 ASPHALT RESTORATION

The Contractor shall furnish, place, and compact hot mix asphalt concrete paving (HMA) over the aggregate base as shown on the Plans (i.e., from minus 6 inches to surface grade). The HMA aggregate, binder, and other materials shall meet the requirements of Sections 5-04, 9-02, and 9-03 of the Standard Specifications for ¾-inch Class HMA.

The AC shall be placed in lifts not to exceed 4 inches and not less than 2 inches thick (compacted thickness). Each lift of AC pavement shall be tested for density for a minimum average of 92 percent of the theoretical maximum density. Testing shall be performed at two locations chosen by the Stantec engineer within each lift. The density tests shall be performed by means of a nuclear device in accordance with Sections 5-04.3(10) and 5-04.3(10)A of the Standard Specifications.

The finished AC surface shall conform to the smoothness tolerance stipulated in Section 5-04.3(13) of the Standard Specifications, except the surface shall not have depressions greater than ¼ inch when tested with a 12-foot straightedge laid transverse to, or in the direction of paving, and no portion of the pavement shall retain ponded water. In addition, the Contractor shall perform flood testing to demonstrate positive drainage to the satisfaction of the Stantec engineer. The Contractor shall maintain the same grade and drainage patterns found on the ExxonMobil ADC Property prior to remedial excavation activities. A paving



plan, including the location of the existing catch basins (Section 6.10), is shown in Appendix I, Drawing C-4.

Other aspects of the AC placement shall be in accordance with Section 5.04.3 of the Standard Specifications.

6.11 EASTERN BOUNDARY FENCE RESTORATION

Following asphalt surface restoration, the Contractor will install fencing at the site to pre-remedial excavation status along the eastern City of Everett right-of-way and the BNSF parcel boundary. The fence will be installed in a like for like manner from the fence that was removed for excavation activities.

6.12 CITY OF EVERETT RIGHT-OF-WAY RESURFACING

The city of Everett right-of-way located between the ExxonMobil/ADC Parcels and the BNSF Parcel will be re-surfaced with the aggregate base described in section 6.8.3 to the pre-excavation surface grade.

7.0 WASTE MANAGEMENT

Waste disposal profiles including necessary analytical data will be prepared and approved by the applicable disposal facility for all waste streams prior to transportation and disposal. All applicable federal and state regulations required for the transportation and disposal of potentially contaminated material will be met. All analytical data, waste profiles, waste manifests, and bills of lading will be included in waste disposal tracking documents.

7.1 SOIL

Approximately 15,000 cubic yards of hydrocarbon containing soil will be generated from remedial excavation activities. Excavated soil will be transported to the Cadman Delta Remediation Landfill in Everett, Washington.

7.2 LIGHT NON-AQUEOUS PHASE LIQUID

LNAPL generated during dewatering of the excavation will be stored on the ExxonMobil ADC Property and managed and disposed of by Advanced Chemical Transport, Inc. Recovered LNAPL will be transported to Emerald Services Tacoma (Clean Harbors) in Tacoma, Washington.

7.3 GROUNDWATER

Groundwater generated during dewatering activities will be stored and treated on the ExxonMobil ADC Property using the dewatering system summarized in Section 6.4.6. Water will be treated and then discharged to the City of Everett's sanitary sewer system in accordance with the Discharge Authorization.



7.4 SPENT CARBON

Spent granular activated carbon from the water treatment system (Section 6.4.6) will be managed by Pacific Coast Carbon and recycled or disposed at the Pacific Coast Biosphere Carbon facility.

7.5 CONSTRUCTION, ASPHALT, AND MISCELLANEOUS DEBRIS

All construction, asphalt, and miscellaneous debris generated during remedial activities will be handled as non-hazardous construction waste and disposed of at Cadman’s Delta Remediation landfill in Everett, Washington.

7.6 WOOD DEBRIS

During the Port Interim Action, timber (wood debris) was encountered during excavation. If encountered during the ExxonMobil ADC Property excavation, the wood debris will be cut down into sections (if necessary) and transported to the Snohomish County Airport Road Recycling and Transfer Station for final disposal at the Republic Services Roosevelt Regional MSW Landfill.

8.0 SCHEDULE FOR IMPLEMENTATION

An implementation schedule with more detail, including an estimated completion timeline is shown in Figure 3. The projected timeframe for the final remedy is April through September 2024 (23 weeks). The timeframes for planned activities are estimated and are subject to change.

Figure 3 Remedial Excavation Implementation Schedule

Duration	Description
Week 1 – Week 10	<ul style="list-style-type: none"> ExxonMobil ADC mobilization Removal of BNSF fencing Installation of temporary construction fencing Saw cutting, breakout, and removal of perimeter asphalt Removal/rerouting of storm line Shoring Installation
Week 10 – Week 19	<ul style="list-style-type: none"> Soil excavation and loading Backfill below water table Installation of geotextile fabric Backfill above water table
Week 19 – Week 23	<ul style="list-style-type: none"> Shoring removal Final grading work Asphalt resurfacing Installation of BNSF security fencing Demobilization



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EXXONMOBIL ADC ENGINEERING DESIGN REPORT

ExxonMobil ADC

March 26, 2024

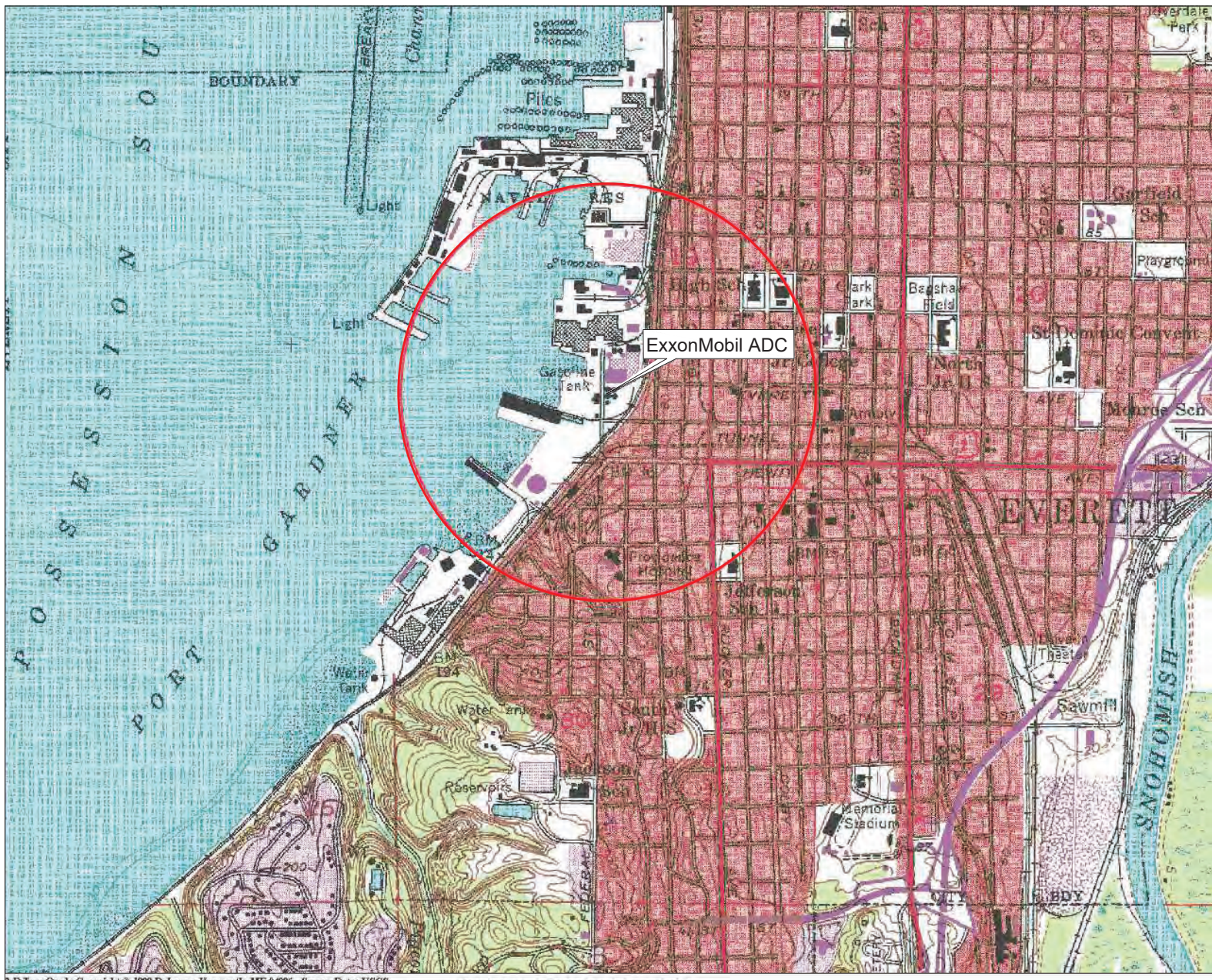
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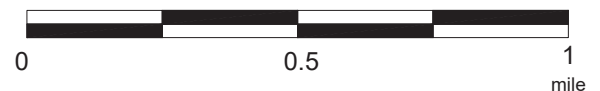
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EXPLANATION

 1/2-mile radius circle



APPROXIMATE SCALE



SITE LOCATION MAP

EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington

PROJECT NO.

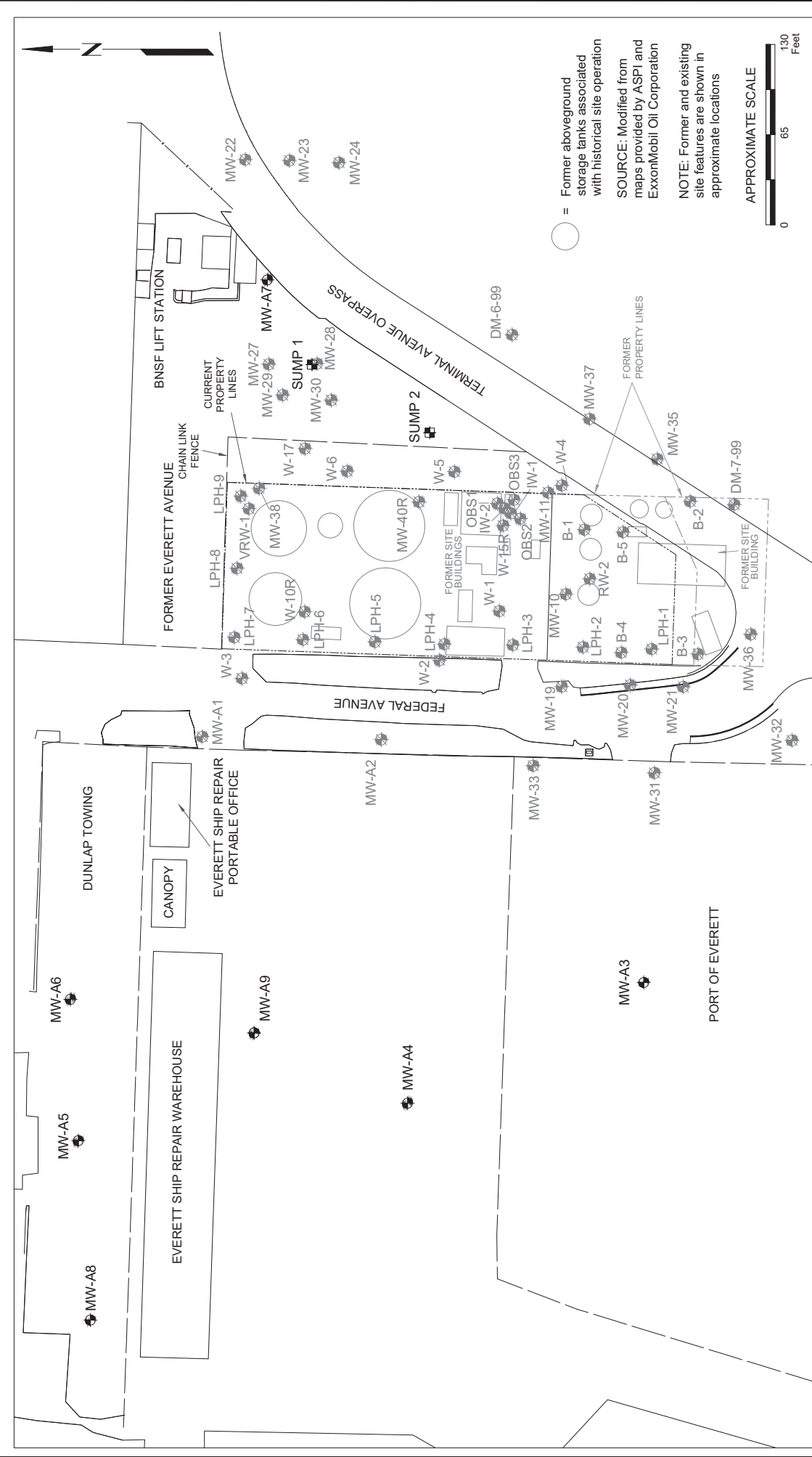
203722941

PLATE

1

LEC: 01/24/23

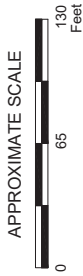




○ = Former aboveground storage tanks associated with historical site operation

SOURCE: Modified from maps provided by ASPI and ExxonMobil Oil Corporation

NOTE: Former and existing site features are shown in approximate locations



PROJECT NO.
203722941

PLATE
2

LEC: 01/19/24

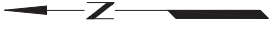
EXPLANATION	SYMBOL
MW-A9	Observation Well
SUMP 2	Groundwater Monitoring Well
MW-38	Groundwater Sump
MW-38	Destroyed Groundwater Monitoring Well

GENERALIZED SITE PLAN

EXXOMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington



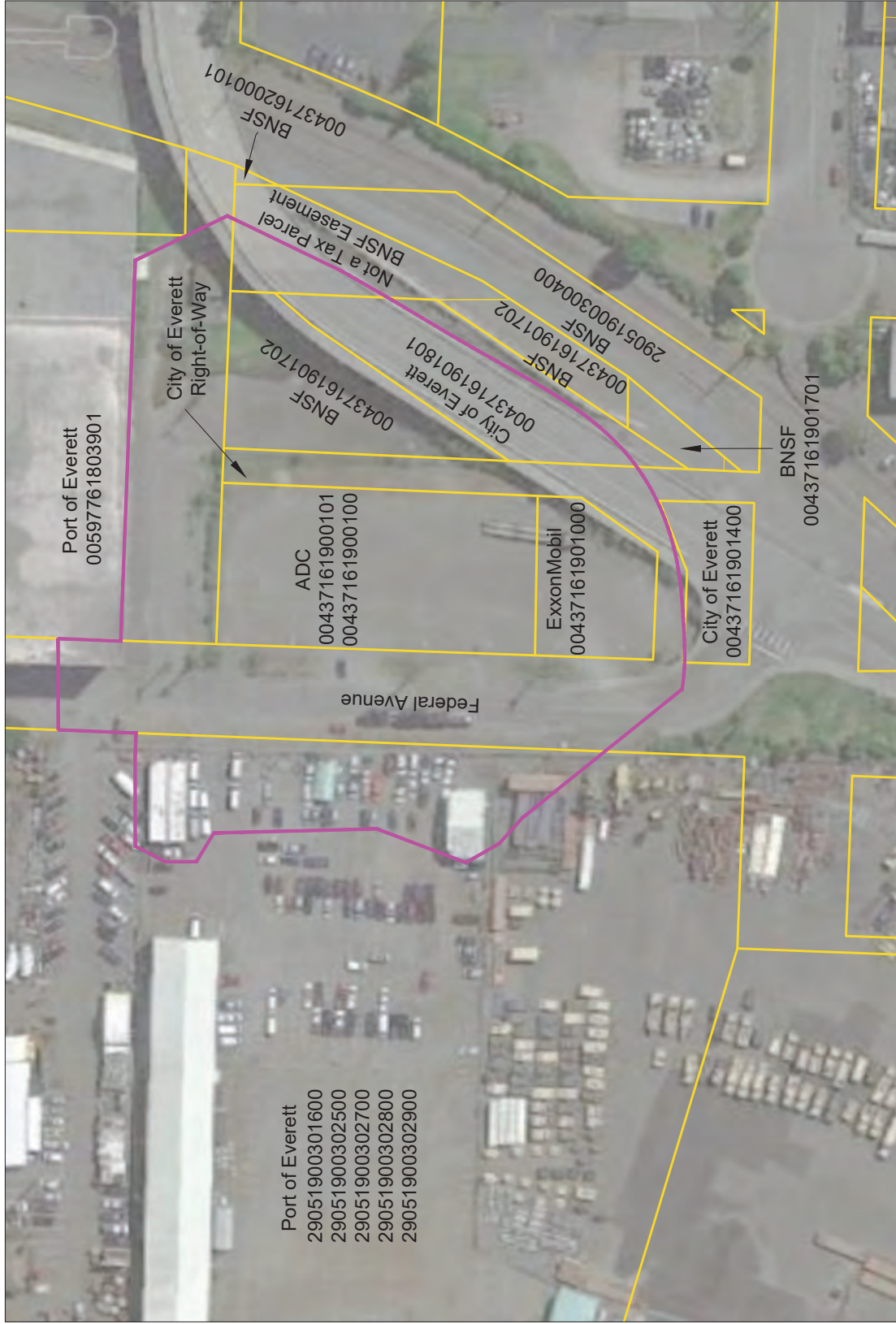
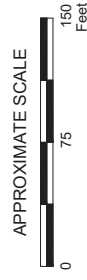
FN 2037229410002



EXPLANATION

-  MTCA Site Boundary
-  Tax Parcel Boundary

SOURCE: Modified from maps provided by the Snohomish County Assessor



FN 2037229410002

SITE BOUNDARY MAP

EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington

PROJECT NO.
 203722941

PLATE
 3
 LEC: 03/28/23





FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

BGS Below Ground Surface
 B B' Cross Section Traverse

UTILITIES LEGEND

- 24" STORM SEWER
- ELECTRICAL
- WATER
- STORM DRAIN
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE

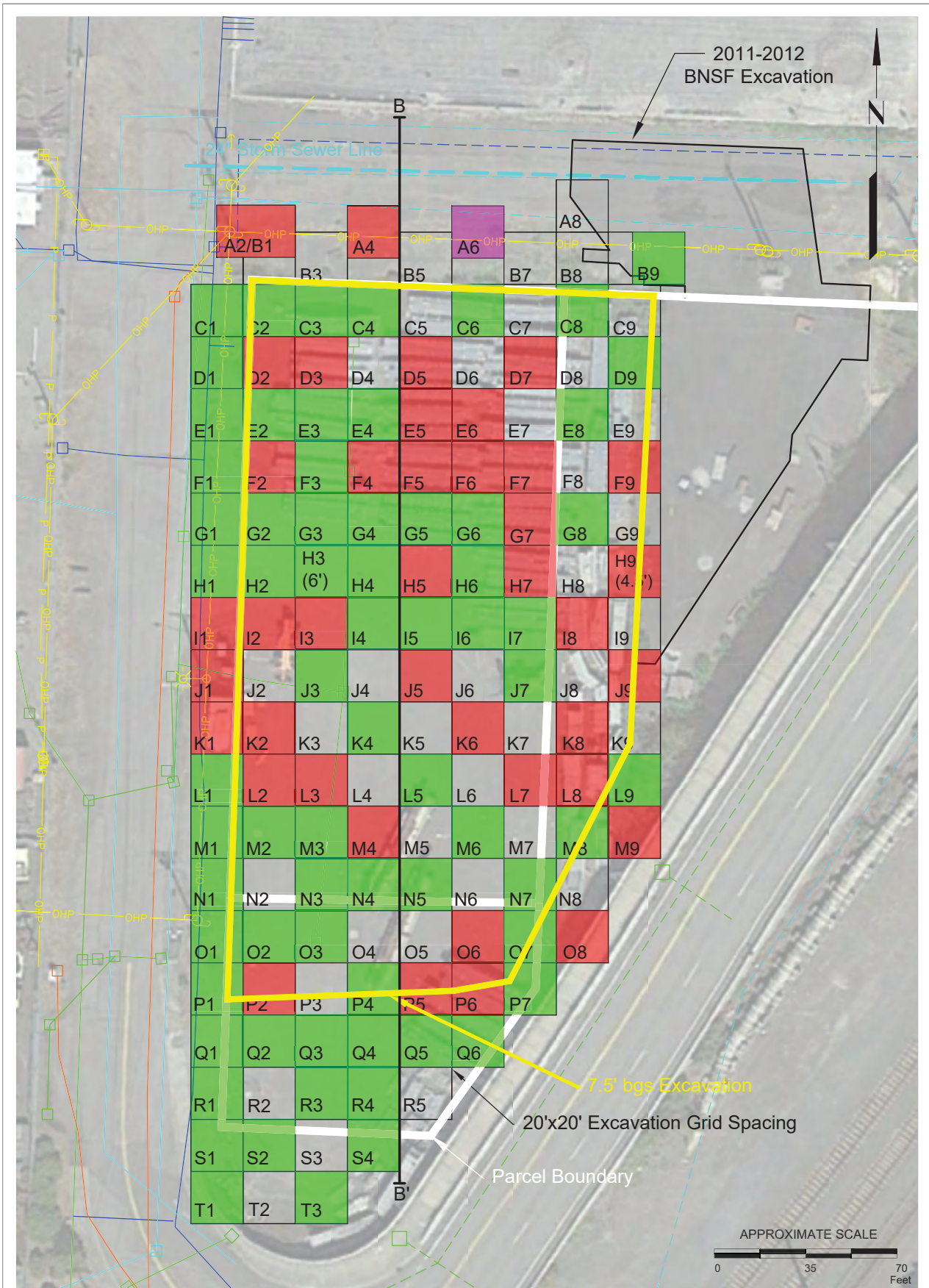


EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 2.5 FEET BGS

EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington

PROJECT NO.
 238000337

PLATE
 04
 RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

- Magenta Indicates Light Non-Aqueous Phase Liquid (LNAPL) Observed; Analyte Concentrations Less than Residual Saturation Remediation Levels
- Cross Section Traverse
- BGS Below Ground Surface

UTILITIES LEGEND

- STORM DRAIN
- ELECTRICAL
- WATER
- STORM DRAIN
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 5 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.
238000337

PLATE
05
RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

- Magenta Indicates Light Non-Aqueous Phase Liquid (LNAPL) Observed; Analyte Concentrations Less than Residual Saturation Remediation Levels
- Cross Section Traverse
- BGS Below Ground Surface

UTILITIES LEGEND

- ELECTRICAL
- WATER
- STORM DRAIN
- GAS
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 7.5 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.

238000337

PLATE

06

RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION		<p>Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels</p> <p>Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels</p>		<p>Magenta Indicates Light Non-Aqueous Phase Liquid (LNAPL) Observed; Analyte Concentrations Less than Residual Saturation Remediation Levels</p>	<p>B B' Cross Section Traverse</p> <p>BGS Below Ground Surface</p>	<p>UTILITIES LEGEND</p> <ul style="list-style-type: none"> --- ELECTRICAL --- WATER --- STORM DRAIN --- POWER ○ POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE
--------------------	--	--	--	---	--	--



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 10 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.
238000337

PLATE
07

RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

- Magenta Indicates Light Non-Aqueous Phase Liquid (LNAPL) Observed; Analyte Concentrations Less than Residual Saturation Remediation Levels
- Cross Section Traverse
- BGS Below Ground Surface

UTILITIES LEGEND

- ELECTRICAL
- WATER
- STORM DRAIN
- GAS
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 12.5 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.

238000337

PLATE

08

RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

B B' Cross Section Traverse

BGS Below Ground Surface

UTILITIES LEGEND

- STORM DRAIN
- ELECTRICAL
- WATER
- STORM DRAIN
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE

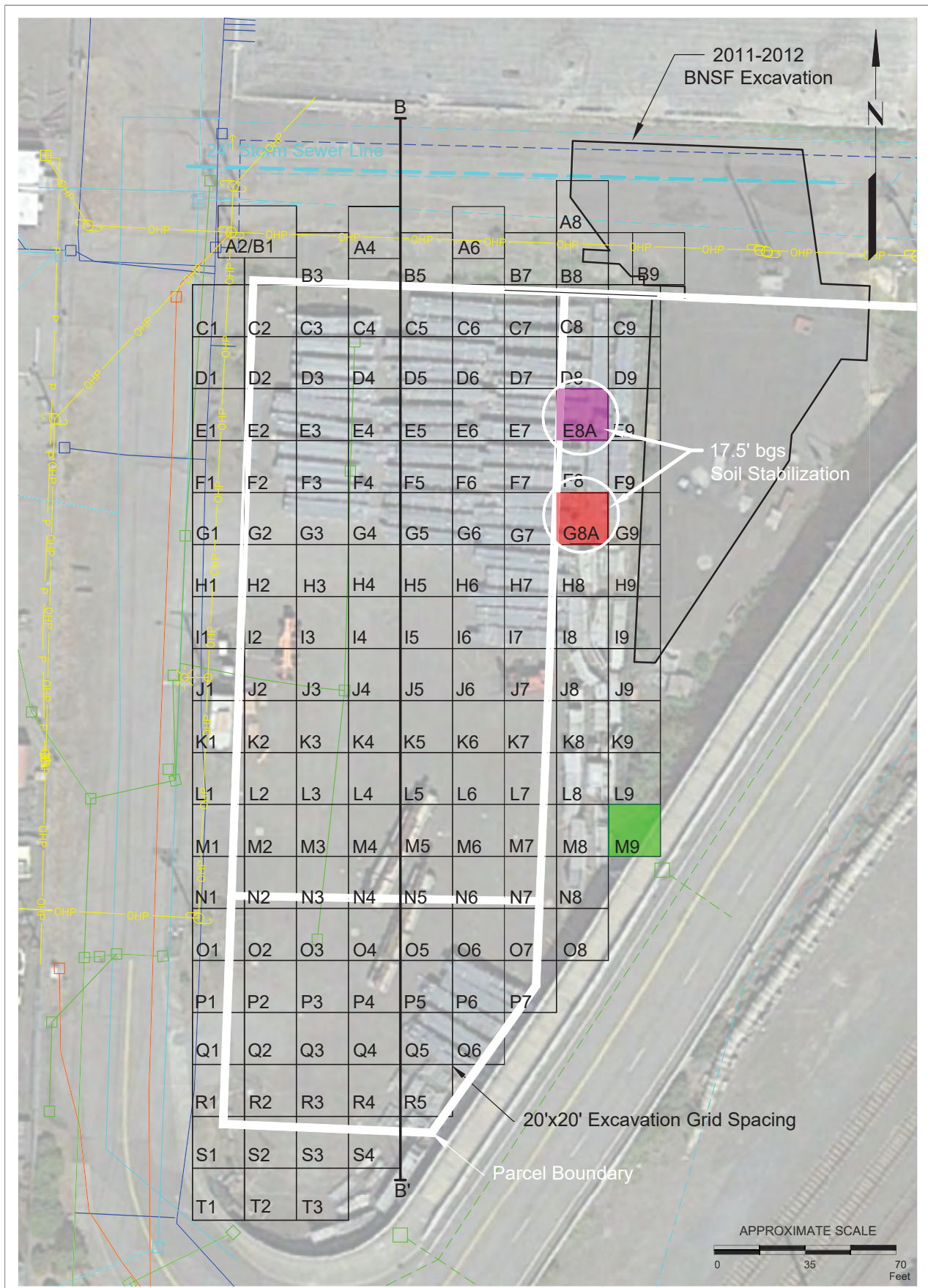


EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 15 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.
238000337

PLATE
09
RRT: 02/28/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

B B' Cross Section Traverse

BGS Below Ground Surface

UTILITIES LEGEND

- ELECTRICAL
- WATER
- STORM DRAIN
- GAS
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 17.5 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

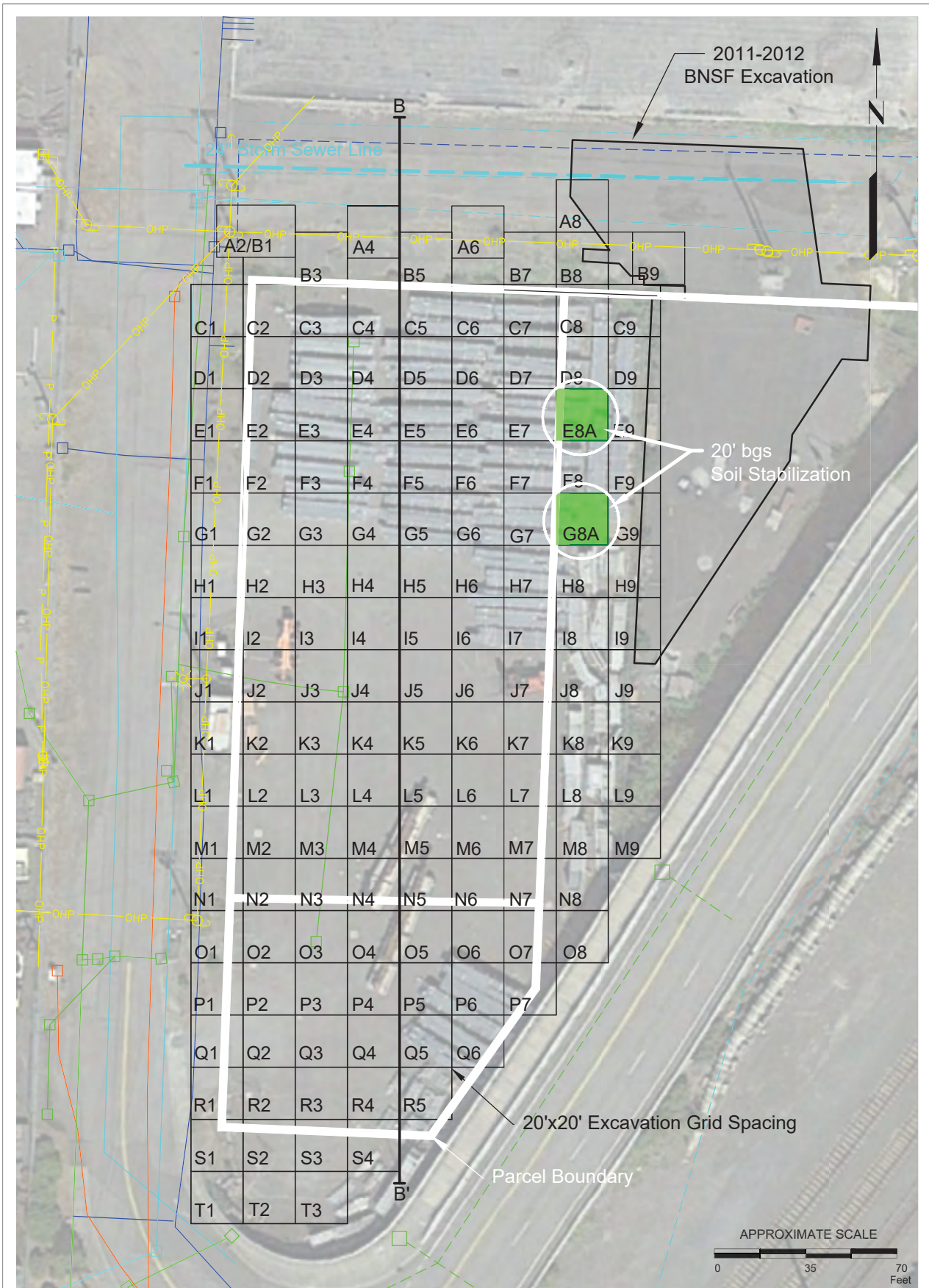
PROJECT NO.

238000337

PLATE

10

LEC: 06/27/23



FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- Red Indicates Analyte Concentrations Greater than Residual Saturation Remediation Levels
- Green Indicates Analyte Concentrations Less than Residual Saturation Remediation Levels

B B' Cross Section Traverse

BGS Below Ground Surface

UTILITIES LEGEND

- ELECTRICAL
- WATER
- STORM DRAIN
- GAS
- POWER
- POWER, COMMUNICATION, AND/OR SECURITY CAMERA POLE



EXXONMOBIL ADC EXCAVATION DELINEATION MAP - 20 FEET BGS

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT NO.
238000337

PLATE
11
LEC: 06/27/23



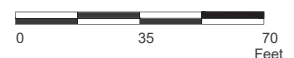
FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- 7.5' bgs Defined Excavation Extents
- 10' bgs Defined Excavation Extents
- 12.5' bgs Defined Excavation Extents
- 15' bgs Defined Excavation Extents
- 20' bgs Defined Soil Stabilization Extents
- 2011-2012 BNSF Excavation

APPROXIMATE SCALE



PROPOSED EXXONMOBIL ADC EXCAVATION EXTENTS BY DEPTH

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

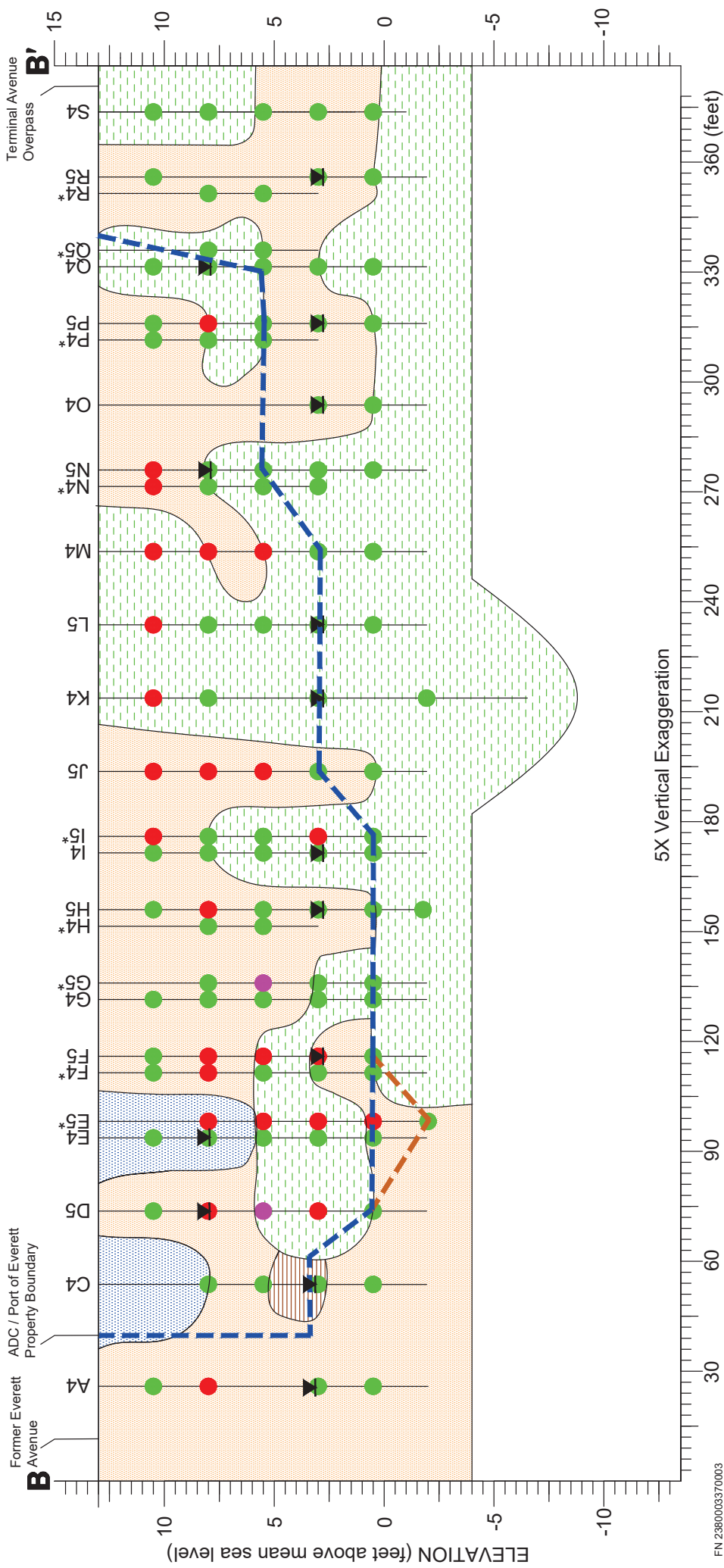
PROJECT NO.
238000337

PLATE
12
LEC: 06/28/23

N

* = No geologic logging was conducted at borings E5, F4, G5, H4, I5, N4, P4, Q5, and R4

S



5X Vertical Exaggeration

FN 2380003370003

EXPLANATION

- ▲ Water Level Encountered During Drilling
- Hydrocarbon Concentrations in Soil Less Than Site-Specific Residual Saturation Remediation Levels
- Hydrocarbon Concentrations in Soil Greater Than Site-Specific Residual Saturation Remediation Levels
- LNAPL Observed During Drilling
- - - Proposed Excavation Extents
- - - Proposed In-Situ Soil Stabilization Extents

Coarse-grained Gravelly Sediments (GW, GF, GC)
 Coarse-grained Sandy Sediments (SW, SP, SM, SC)
 Fine-grained Sediments (CL, ML)
 Organic Sediments (Wood Debris)

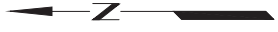
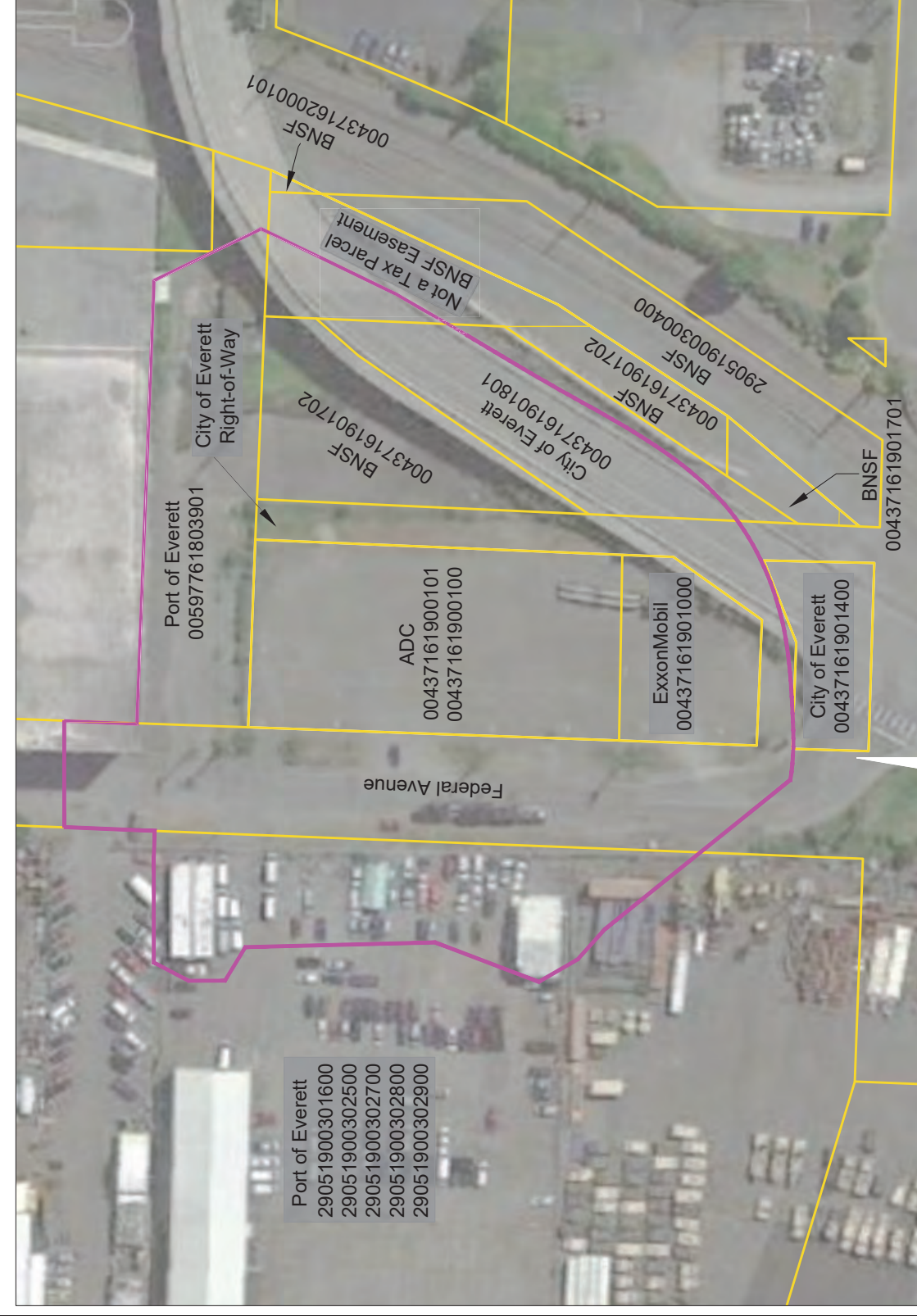
EXXONMOBIL ADC CROSS SECTION N-S

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

PROJECT
238000337

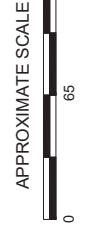
PLATE
13
LEC: 06/29/23





NOTE: Institutional controls in the form of restrictive covenants will be implemented to protect human health and the environment for parcels located within the Restrictive Covenant Boundary. These parcels include inaccessible areas as defined in the Cleanup Action Plan and in areas where soil and/or groundwater concentrations remain exceeding the MTCA Method A Cleanup Levels.

SOURCE: Modified from maps provided by ASPI and ExxonMobil Oil Corporation



Port of Everett
 2905 190030 1600
 2905 190030 2500
 2905 190030 2700
 2905 190030 2800
 2905 190030 2900

FN 2380003370002

LOCATIONS OF PROPOSED RESTRICTIVE COVENANTS
 EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington

PROJECT NO.
238000337

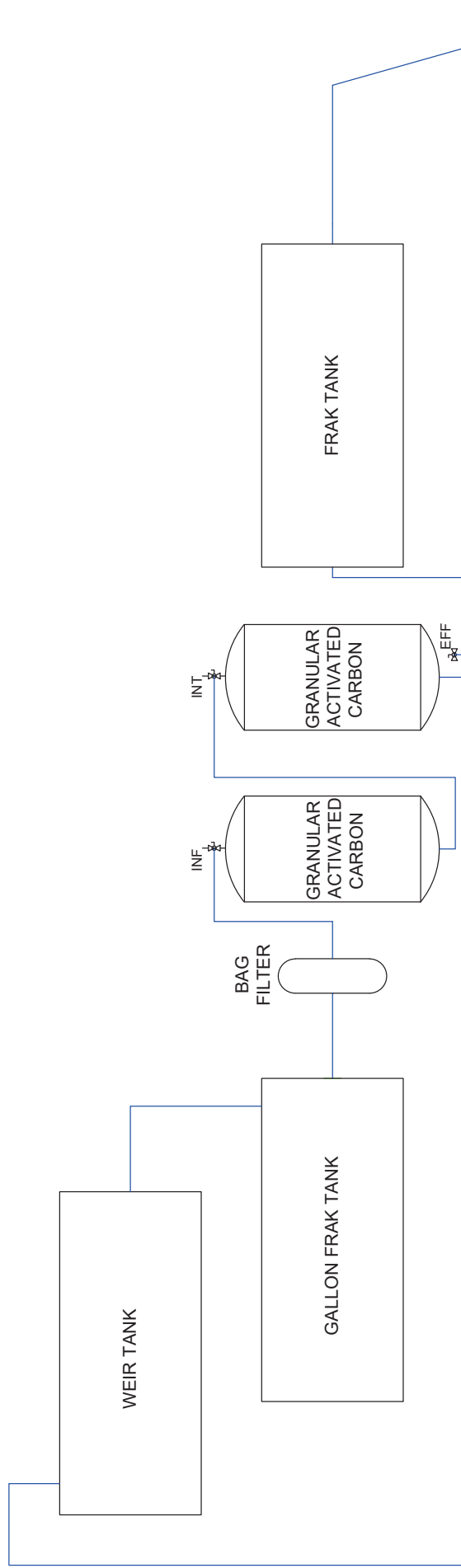
PLATE
14

LEC: 06/28/23

EXPLANATION

- MW-A9 Groundwater Monitoring Well
- SUMP 2 Groundwater Sump
- MW-38 Destroyed Groundwater Monitoring Well
- OBS1 Observation Well
- Restrictive Covenant Boundary
- Parcel Boundary





INFLUENT - Miscellaneous pumps, hoses, fittings, flow meter, sample port, etc. to pump and treat water from the pit at a rate of 150 GPM.

EFFLUENT - Discharge City of Everett Side Sewer Max 150 GPM

Sheet No.
15

Project No.
203722941

Creation Date
03/06/24

Last Rev. Date
03/26/24

Plot Scale
NO SCALE

Drawn/Approved
RRT

AutoCad File
Dewatering Flow

Project
ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington

Drawing

SAMPLE DEWATERING PLAN



**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Page 1 of 14

Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023:							
S-2.5-A2	A2	08/11/21	2.5	--	<0.26	<5.5	<5.5
S-5-A2	A2	08/11/21	5	--	250	340	45
S-7.5-A2	A2	08/11/21	7.5	--	520	7,400	650
S-10-A2	A2	08/11/21	10	--	76	260	44
S-12.5-A2	A2	08/11/21	12.5	Yes	570	11,000	2,200
S-14.5-A2	A2	08/11/21	14.5	--	<0.13	<6.3	11
S-2.5-A4	A4	08/11/21	2.5	--	<0.24	<5.5	110
S-5-A4	A4	08/11/21	5	--	300	8,700	1,500
S-10-A4	A4	08/11/21	10	--	72	270	74
S-12.5-A4	A4	08/11/21	12.5	--	0.42	<7.8	<7.8
S-2.5-A6	A6	08/12/21	2.5	Yes	520	7,300	1,600
S-5-A6	A6	08/12/21	5	Yes	220	1,700	410
S-7.5-A6	A6	08/12/21	7.5	Yes	450	6,700	3,500
S-10-A6	A6	08/12/21	10	--	5.2	8.1	11
S-12.5-A6	A6	08/12/21	12.5	--	0.40	83	55
S-2.5-A8	A8	08/16/21	2.5	--	20	69	29
S-10-A8	A8	08/16/21	10	Yes	160	580	260
S-12.5-A8	A8	08/16/21	12.5	Yes	100	630	330
S-14.5-A8	A8	08/16/21	14.5	--	1.6	85	48
S-2.5-B1	B1	08/11/21	2.5	--	<0.25	<5.4	6.0
S-5-B1	B1	08/11/21	5	--	56	6,300	1,600
S-7.5-B1	B1	08/11/21	7.5	--	5.4	20	17
S-10-B1	B1	08/11/21	10	--	0.42	<7.2	<7.2
S-12.5-B1	B1	08/11/21	12.5	--	0.28	<6.1	<6.1
S-2.5-B9	B9	08/12/21	2.5	--	0.60	23	44
S-5-B9	B9	08/12/21	5	--	8.0	110	150
S-7.5-B9	B9	08/12/21	7.5	--	6.9	89	60
S-10-B9	B9	08/12/21	10	--	35	160	110
S-12.5-B9	B9	08/12/21	12.5	Yes	43	150	120
S-13-B9	B9	08/12/21	13	--	89	440	270
S-15-B9A	B9A	10/14/21	15	--	<1.7	<54	<54
S-5-C1	C1	10/15/21	5	--	260	4,400	1,100
S-5-C1 DUP	C1	10/15/21	5	--	160	1,500	350
S-7.5-C1	C1	10/15/21	7.5	--	8.0	47	<11
S-10-C1	C1	10/15/21	10	--	0.54	<7.3	<7.3
S-12.5-C1	C1	10/15/21	12.5	--	<0.28	<6.8	<6.8
S-5-C2	C2	08/09/21	5	--	0.57	<29	500
S-7.5-C2	C2	08/09/21	7.5	--	<1.3	1,700	660
S-10-C2	C2	08/09/21	10	--	1.3	27	20
S-12.5-C2	C2	08/09/21	12.5	--	85	98	42
S-5-C3	C3	10/12/21	5	--	2.1	290	410
S-7.5-C3	C3	10/12/21	7.5	--	120	1,200	1,200
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Page 2 of 14

Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-10-C3	C3	10/12/21	10	--	<0.30	<6.0	6.6
S-12.5-C3	C3	10/12/21	12.5	--	0.96	<6.6	<6.6
S-5-C4	C4	08/09/21	5	--	760	140	38
S-7.5-C4	C4	08/09/21	7.5	--	22	1,900	410
S-10-C4	C4	08/09/21	10	--	170	740	240
S-12.5-C4	C4	08/09/21	12.5	--	0.56	<6.7	7.4
S-2.5-C6	C6	08/09/21	2.5	--	3.7	1,800	1,300
S-5-C6	C6	08/09/21	5	--	0.21	290	1,100
S-7.5-C6	C6	08/09/21	7.5	Yes	94	2,800	1,300
S-10-C6	C6	08/09/21	10	--	29	1,200	520
S-2.5-C8	C8	08/09/21	2.5	--	1.0	540	160
S-5-C8	C8	08/09/21	5	--	0.50	<7.3	<7.3
S-7.5-C8	C8	08/09/21	7.5	--	2.6	53	29
S-10-C8	C8	08/09/21	10	Yes	840	13,000	4,600
S-12.5-C8	C8	08/09/21	12.5	Yes	290	4,000	1,400
S-15-C8A	C8A	10/12/21	15	--	<0.97	<24	<24
S-2.5-D1	D1	08/09/21	2.5	--	190	390	440
S-5-D1	D1	08/09/21	5	--	26	410	94
S-7.5-D1	D1	08/09/21	7.5	--	25	5,700	1,700
S-10-D1	D1	08/09/21	10	--	160	400	220
S-10-D1 DUP	D1	08/09/21	10	--	190	170	72
S-12.5-D1	D1	08/09/21	12.5	--	0.60	<6.3	<6.3
S-7.5-D1A	D1A	10/15/21	7.5	--	22	930	360
S-10-D1A	D1A	10/15/21	10	--	0.62	<6.2	<6.2
S-5-D2	D2	10/12/21	5	--	200	5,200	3,600
S-7.5-D2	D2	10/12/21	7.5	Yes	540	4,600	2,200
S-10-D2	D2	10/12/21	10	--	<0.23	<6.3	<6.3
S-2.5-D3	D3	08/09/21	2.5	--	260	4,100	1,400
S-5-D3	D3	08/09/21	5	--	1,600	22,000	3,900
S-7.5-D3	D3	08/09/21	7.5	--	68	560	2,200
S-10-D3	D3	08/09/21	10	--	86	390	110
S-12.5-D3	D3	08/09/21	12.5	--	0.38	<6.4	<6.4
S-2.5-D5	D5	08/09/21	2.5	--	370	1,600	580
S-5-D5	D5	08/09/21	5	Yes	470	18,000	4,600
S-5-D5 DUP	D5	08/09/21	5	Yes	300	4,000	1,400
S-7.5-D5	D5	08/09/21	7.5	--	81	3,600	930
S-10-D5	D5	08/09/21	10	Yes	800	11,000	2,400
S-12.5-D5	D5	08/09/21	12.5	--	2.1	<6.6	<6.6
S-2.5-D7	D7	08/09/21	2.5	--	63	4,300	1,900
S-5-D7	D7	08/09/21	5	--	810	29,000	6,900
S-7.5-D7	D7	08/09/21	7.5	--	350	9,200	3,500
S-10-D7	D7	08/09/21	10	Yes	650	40,000	7,000
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Page 3 of 14

Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):								
S-12.5-D7	D7	08/09/21	12.5	--	13	420	160	
S-2.5-D9	D9	08/09/21	2.5	--	0.32	290	120	
S-5-D9	D9	08/09/21	5	--	1.3	180	620	
S-7.5-D9	D9	08/09/21	7.5	--	1,200	19,000	5,900	
S-10-D9	D9	08/09/21	10	Yes	550	2,700	1,300	
S-12.5-D9	D9	08/09/21	12.5	--	36	290	190	
S-2.5-E1	E1	10/15/21	2.5	--	<0.27	<33	48	
S-5-E1	E1	10/15/21	5	--	<0.26	<6.4	<6.4	
S-7.5-E1	E1	10/15/21	7.5	--	<0.34	<7.1	<7.1	
S-10-E1	E1	10/15/21	10	--	<1.4	<12	<12	
S-2.5-E2	E2	08/09/21	2.5	--	64	430	240	
S-5-E2	E2	08/09/21	5	--	280	1,000	200	
S-7.5-E2	E2	08/09/21	7.5	--	280	1,500	95	
S-10-E2	E2	08/09/21	10	--	160	250	22	
S-12.5-E2	E2	08/09/21	12.5	--	0.36	<7.4	<7.4	
S-2.5-E3	E3	10/12/21	2.5	--	0.37	110	220	
S-5-E3	E3	10/12/21	5	--	18	2,900	2,100	
S-7.5-E3	E3	10/12/21	7.5	--	<0.21	<5.6	9.0	
S-2.5-E4	E4	08/09/21	2.5	--	270	4,100	1,300	
S-5-E4	E4	08/09/21	5	--	25	1,500	320	
S-7.5-E4	E4	08/09/21	7.5	--	22	13	<6.9	
S-10-E4	E4	08/09/21	10	--	38	320	96	
S-10-E4 DUP	E4	08/09/21	10	--	140	42	34	
S-12.5-E4	E4	08/09/21	12.5	--	0.48	<6.3	<6.3	
S-5-E5	E5	10/12/21	5	--	650	89,000	9,200	
S-7.5-E5	E5	10/12/21	7.5	Yes	770	36,000	3,100	
S-10-E5	E5	10/12/21	10	Yes	740	22,000	1,700	
S-12.5-E5	E5	10/12/21	12.5	Yes	140	27,000	2,500	
S-15-E5	E5	10/12/21	15	--	0.27	<6.5	<6.5	
S-2.5-E6	E6	08/09/21	2.5	--	<43	15,000	2,200	
S-5-E6	E6	08/09/21	5	--	710	96,000	8,700	
S-7.5-E6	E6	08/09/21	7.5	--	620	3,900	380	
S-10-E6	E6	08/09/21	10	Yes	570	13,000	1,300	
S-12.5-E6	E6	08/09/21	12.5	--	250	5,100	550	
S-15-E6A	E6A	10/12/21	15	--	<0.22	<6.0	<6.0	
S-2.5-E8	E8	08/09/21	2.5	--	0.38	390	130	
S-5-E8	E8	08/09/21	5	--	210	940	890	
S-7.5-E8	E8	08/09/21	7.5	Yes	170	14,000	3,200	
S-10-E8	E8	08/09/21	10	Yes	1,300	28,000	7,900	
S-12.5-E8	E8	08/09/21	12.5	Yes	280	6,000	1,900	
S-15-E8A	E8A	10/12/21	15	--	1.4	<6.1	<6.1	
S-17.5-E8A	E8A	10/12/21	17.5	Yes	23	72	25	
Site-Specific Residual Saturation Remediation Levels						2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):								
S-20-E8A	E8A	10/12/21	20	--	<2.3	<56	83	
S-20-E8A DUP	E8A	10/12/21	20	--	<1.9	<530	570	
S-2.5-F1	F1	10/13/21	2.5	--	<0.28	<30	120	
S-5-F1	F1	10/13/21	5	--	0.19	71	130	
S-7.5-F1	F1	10/13/21	7.5	--	51	20	<6.7	
S-2.5-F2	F2	10/13/21	2.5	--	170	1,900	280	
S-5-F2	F2	10/13/21	5	--	180	7,200	2,600	
S-2.5-F3	F3	08/10/21	2.5	--	300	6,500	2,500	
S-5-F3	F3	08/10/21	5	--	360	1,400	560	
S-10-F3	F3	08/10/21	10	--	<0.21	<6.2	19	
S-12.5-F3	F3	08/10/21	12.5	--	<0.28	<6.8	7.8	
S-2.5-F4	F4	10/13/21	2.5	--	180	570	200	
S-5-F4	F4	10/13/21	5	--	560	11,000	800	
S-7.5-F4	F4	10/13/21	7.5	--	0.25	<6.0	<6.0	
S-10-F4	F4	10/13/21	10	--	<0.25	<6.0	<6.0	
S-12.5-F4	F4	10/13/21	12.5	--	<1.7	<40	55	
S-2.5-F5	F5	08/10/21	2.5	--	310	500	270	
S-5-F5	F5	08/10/21	5	Yes	1,300	76,000	6,200	
S-7.5-F5	F5	08/10/21	7.5	--	1,400	20,000	2,000	
S-10-F5	F5	08/10/21	10	--	870	21,000	2,100	
S-12.5-F5	F5	08/10/21	12.5	--	1.8	<16	46	
S-5-F6	F6	10/13/21	5	--	150	9,600	2,400	
S-7.5-F6	F6	10/13/21	7.5	--	520	22,000	3,100	
S-10-F6	F6	10/13/21	10	Yes	560	62,000	6,200	
S-12.5-F6	F6	10/13/21	12.5	Yes	92	3,200	760	
S-15-F6	F6	10/13/21	15	--	<0.73	<24	53	
S-2.5-F7	F7	08/10/21	2.5	--	66	160	110	
S-5-F7	F7	08/10/21	5	--	540	32,000	5,800	
S-7.5-F7	F7	08/10/21	7.5	--	340	65,000	15,000	
S-10-F7	F7	08/10/21	10	--	330	1,400	320	
S-12.5-F7	F7	08/10/21	12.5	--	12	480	170	
S-2.5-F9	F9	08/10/21	2.5	--	28	140	7.9	
S-2.5-F9 DUP ^c	F9	08/10/21	2.5	--	27	120	<5.6	
S-5-F9	F9	08/10/21	5	--	510	12,000	7,000	
S-7.5-F9	F9	08/10/21	7.5	--	200	630	190	
S-10-F9	F9	08/10/21	10	--	260	16,000	5,400	
S-10-F9 DUP	F9	08/10/21	10	--	470	13,000	5,300	
S-12.5-F9	F9	08/10/21	12.5	--	4.4	270	210	
S-2.5-G1	G1	10/13/21	2.5	--	<0.22	100	330	
S-5-G1	G1	10/13/21	5	--	<0.19	6.8	13	
S-7.5-G1	G1	10/13/21	7.5	Yes	610	7,800	3,700	
S-10-G1	G1	10/13/21	10	--	<0.28	<11	<11	
Site-Specific Residual Saturation Remediation Levels						2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-2.5-G2	G2	08/10/21	2.5	--	240	2,200	1,100
S-5-G2	G2	08/10/21	5	--	50	190	150
S-10-G2	G2	08/10/21	10	--	3.6	240	120
S-12.5-G2	G2	08/10/21	12.5	--	<1.0	<16	33
S-2.5-G3	G3	10/13/21	2.5	--	170	5,600	1,600
S-5-G3	G3	10/13/21	5	--	7.5	2,400	680
S-7.5-G3	G3	10/13/21	7.5	--	<0.28	<5.4	<5.4
S-2.5-G4	G4	08/10/21	2.5	--	110	2,800	1,400
S-5-G4	G4	08/10/21	5	--	250	250	130
S-7.5-G4	G4	08/10/21	7.5	--	12	12	77
S-10-G4	G4	08/10/21	10	--	96	68	150
S-12.5-G4	G4	08/10/21	12.5	--	<1.3	<20	100
S-5-G5	G5	10/13/21	5	--	190	4,400	1,100
S-7.5-G5	G5	10/13/21	7.5	Yes	110	1,600	810
S-10-G5	G5	10/13/21	10	--	280	210	150
S-12.5-G5	G5	10/13/21	12.5	--	3.3	760	480
S-2.5-G6	G6	08/10/21	2.5	--	280	1,700	530
S-5-G6	G6	08/10/21	5	--	260	1,100	350
S-7.5-G6	G6	08/10/21	7.5	--	170	1,800	610
S-10-G6	G6	08/10/21	10	Yes	240	670	150
S-12.5-G6	G6	08/10/21	12.5	--	170	590	120
S-2.5-G7	G7	10/13/21	2.5	--	6.9	6,800	2,500
S-5-G7	G7	10/13/21	5	--	95	6,500	2,000
S-7.5-G7	G7	10/13/21	7.5	--	240	8,200	1,800
S-10-G7	G7	10/13/21	10	Yes	190	4,300	1,500
S-12.5-G7	G7	10/13/21	12.5	--	9.5	85	<41
S-15-G7	G7	10/13/21	15	--	<1.0a	56	120
S-2.5-G8	G8	08/10/21	2.5	--	120	380	27
S-5-G8	G8	08/10/21	5	--	230	350	30
S-7.5-G8	G8	08/10/21	7.5	Yes	1,400	5,000	960
S-10-G8	G8	08/10/21	10	Yes	1,400	2,700	550
S-12.5-G8	G8	08/10/21	12.5	--	2,400	12,000	2,900
S-15-G8A	G8A	10/12/21	15	Yes	2,200	12,000	3,000
S-17.5-G8A	G8A	10/12/21	17.5	Yes	2,900	29,000	7,100
S-20-G8A	G8A	10/12/21	20	--	<1.6	<110	730
S-2.5-H1	H1	10/13/21	2.5	--	<0.28	<25	160
S-5-H1	H1	10/13/21	5	--	<0.24	900	1,300
S-7.5-H1	H1	10/13/21	7.5	Yes	140	4,000	360
S-10-H1	H1	10/13/21	10	--	<0.77	<20	35
S-2.5-H2	H2	10/13/21	2.5	--	76	2,200	780
S-5-H2	H2	10/13/21	5	--	270	1,700	680
S-7.5-H2	H2	10/13/21	7.5	--	870	6,200	920
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-10-H2	H2	10/13/21	10	--	<0.57	<79	170
S-2.5-H3	H3	08/11/21	2.5	--	230	2,300	1,000
S-6-H3	H3	08/11/21	6	--	230	93	26
S-7.5-H3	H3	08/11/21	7.5	--	1.1	13	11
S-10-H3	H3	08/11/21	10	--	76	370	100
S-12.5-H3	H3	08/11/21	12.5	--	<0.58	46	53
S-5-H4	H4	10/13/21	5	--	110	2,100	320
S-7.5-H4	H4	10/13/21	7.5	--	0.64	6.3	<5.6
S-2.5-H5	H5	08/10/21	2.5	--	480	1,400	780
S-5-H5	H5	08/10/21	5	--	650	4,900	1,300
S-5-H5 DUP	H5	08/10/21	5	--	530	1,400	350
S-7.5-H5	H5	08/10/21	7.5	--	320	380	120
S-10-H5	H5	08/10/21	10	--	140	1,300	410
S-12.5-H5	H5	08/10/21	12.5	--	9.2	<7.6	36
S-14.5-H5	H5	08/10/21	14.5	--	63	200	62
S-2.5-H6	H6	10/13/21	2.5	--	7.4	1,800	650
S-5-H6	H6	10/13/21	5	--	7.7	3,900	3,400
S-7.5-H6	H6	10/13/21	7.5	--	430	8,300	2,200
S-10-H6	H6	10/13/21	10	--	810	5,400	1,500
S-12.5-H6	H6	10/13/21	12.5	--	11	110	74
S-2.5-H7	H7	08/10/21	2.5	--	170	6,500	3,100
S-5-H7	H7	08/10/21	5	--	370	15,000	3,900
S-7.5-H7	H7	08/10/21	7.5	--	290	1,200	500
S-7.5-H7 DUP	H7	08/10/21	7.5	--	330	140	82
S-10-H7	H7	08/10/21	10	--	130	770	360
S-12.5-H7	H7	08/10/21	12.5	--	38	230	110
S-2.5-H9	H9	08/11/21	2.5	--	4.2	1,000	70
S-4.5-H9	H9	08/11/21	4.5	--	1,600	36,000	4,300
S-10-H9	H9	08/11/21	10	--	2,400	28,000	4,700
S-12.5-H9	H9	08/11/21	12.5	--	53	2,000	1,200
S-14.5-H9	H9	08/11/21	14.5	--	<1.8	200	160
S-2.5-I1	I1	10/13/21	2.5	--	<0.20	<5.5	20
S-5-I1	I1	10/13/21	5	--	95	5,700	440
S-7.5-I1	I1	10/13/21	7.5	--	13	360	<22
S-10-I1	I1	10/13/21	10	--	<0.74	<14	36
S-2.5-I2	I2	08/11/21	2.5	--	170	6,800	2,600
S-5-I2	I2	08/11/21	5	--	310	7,600	1,800
S-7.5-I2	I2	08/11/21	7.5	--	4.3	220	170
S-10-I2	I2	08/11/21	10	--	53	1,300	560
S-12.5-I2	I2	08/11/21	12.5	--	13	150	83
S-2.5-I3	I3	10/13/21	2.5	--	3.1	660	670
S-5-I3	I3	10/13/21	5	--	220	5,000	2,000
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):								
S-7.5-I3	I3	10/13/21	7.5	--	0.30	110	63	
S-10-I3	I3	10/13/21	10	--	<0.20	<5.8	<5.8	
S-2.5-I4	I4	08/11/21	2.5	--	4.9	1,300	450	
S-5-I4	I4	08/11/21	5	--	<0.22	14	<5.9	
S-7.5-I4	I4	08/11/21	7.5	--	<0.19	<5.6	6.9	
S-10-I4	I4	08/11/21	10	--	<0.091	36	12	
S-12.5-I4	I4	08/11/21	12.5	--	<1.2	130	140	
S-2.5-I5	I5	10/13/21	2.5	--	330	7,400	1,600	
S-5-I5	I5	10/13/21	5	--	98	1,900	370	
S-7.5-I5	I5	10/13/21	7.5	--	980	4,500	970	
S-10-I5	I5	10/13/21	10	--	870	7,800	<120	
S-12.5-I5	I5	10/13/21	12.5	--	3.1	23	45	
S-12.5-I5-DUP	I5	10/13/21	12.5	--	1.3	34	55	
S-2.5-I6	I6	08/10/21	2.5	--	140	780	450	
S-5-I6	I6	08/10/21	5	--	380	3,500	800	
S-7.5-I6	I6	08/10/21	7.5	--	470	1,100	450	
S-10-I6	I6	08/10/21	10	--	300	1,000	320	
S-12.5-I6	I6	08/10/21	12.5	--	69	<6.5	14	
S-14.5-I6	I6	08/10/21	14.5	--	4.5	<24	50	
S-3.5-I7	I7	10/13/21	3.5	--	380	4,400	1,400	
S-5-I7	I7	10/13/21	5	--	5.0	53	23	
S-10-I7	I7	10/13/21	10	--	280	730	160	
S-12.5-I7	I7	10/13/21	12.5	Yes	99	130	68	
S-15-I7	I7	10/13/21	15	--	<1.3	<38	100	
S-2.5-I8	I8	08/10/21	2.5	--	710	6,900	1,700	
S-5-I8	I8	08/10/21	5	--	2,100	8,300	1,500	
S-7.5-I8	I8	08/10/21	7.5	--	57	1,100	280	
S-10-I8	I8	08/10/21	10	Yes	1,400	4,300	1,800	
S-12.5-I8	I8	08/10/21	12.5	--	1,000	10,000	5,600	
S-15-I8A	I8A	10/13/21	15	--	<1.9	<34	<34	
S-2.5-J1	J1	10/13/21	2.5	--	<0.30	2,100	5,700	
S-5-J1	J1	10/13/21	5	--	580	6,200	490	
S-7.5-J1	J1	10/13/21	7.5	--	8.0	15	<6.3	
S-2.5-J3	J3	08/11/21	2.5	--	4.0	7,600	3,800	
S-5-J3	J3	08/11/21	5	--	130	3,600	810	
S-7.5-J3	J3	08/11/21	7.5	--	210	7,900	750	
S-10-J3	J3	08/11/21	10	--	160	380	140	
S-12.5-J3	J3	08/11/21	12.5	--	<0.84	93	73	
S-2.5-J5	J5	08/10/21	2.5	--	390	7,800	2,800	
S-5-J5	J5	08/10/21	5	--	2,100	55,000	8,200	
S-5-J5 DUP	J5	08/10/21	5	--	1,600	59,000	8,200	
S-7.5-J5	J5	08/10/21	7.5	--	1,200	7,800	1,400	
Site-Specific Residual Saturation Remediation Levels						2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-10-J5	J5	08/10/21	10	--	97	13	12
S-12.5-J5	J5	08/10/21	12.5	--	63	120	51
S-2.5-J7	J7	08/10/21	2.5	--	60	6,700	5,900
S-5-J7	J7	08/10/21	5	--	480	470	170
S-7.5-J7	J7	08/10/21	7.5	--	700	830	160
S-10-J7	J7	08/10/21	10	Yes	2,200	10,000	1,400
S-12.5-J7	J7	08/10/21	12.5	--	910	730	180
S-2.5-J9	J9	08/11/21	2.5	--	480	760	210
S-5-J9	J9	08/11/21	5	Yes	3,100	4,000	410
S-7.5-J9	J9	08/11/21	7.5	Yes	3,300	11,000	730
S-10-J9	J9	08/11/21	10	Yes	590	13,000	2,700
S-12.5-J9	J9	08/11/21	12.5	--	1,700	18,000	4,400
S-14.5-J9	J9	08/11/21	14.5	--	1.5	140	450
S-2.5-K1	K1	10/13/21	2.5	--	970	15,000	3,600
S-5-K1	K1	10/13/21	5	--	620	6,200	110
S-7.5-K1	K1	10/13/21	7.5	--	1.2	<8.2	<8.2
S-2.5-K2	K2	08/17/21	2.5	--	460	5,100	400
S-5-K2	K2	08/17/21	5	--	1,100	14,000	490
S-7.5-K2	K2	08/17/21	7.5	--	1.3	19	15
S-10-K2	K2	08/17/21	10	--	4.2	34	17
S-12.5-K2	K2	08/17/21	12.5	--	580	<8.5	12
S-2.5-K4	K4	08/18/21	2.5	--	570	5,800	140
S-5-K4	K4	08/18/21	5	--	0.99	<5.9	9.1
S-10-K4	K4	08/18/21	10	--	0.67	9.5	14
S-15-K4	K4	08/18/21	15	--	22	65	56
S-2.5-K6	K6	08/18/21	2.5	--	1,200	3,100	320
S-5-K6	K6	08/18/21	5	--	560	14,000	920
S-7.5-K6	K6	08/18/21	7.5	--	320	1,100	47
S-10-K6	K6	08/18/21	10	--	120	38	33
S-12.5-K6	K6	08/18/21	12.5	--	<0.24	<6.0	6.2
S-2.5-K8	K8	08/18/21	2.5	--	4.5	2,800	530
S-5-K8	K8	08/18/21	5	--	3,200	19,000	2,300
S-7.5-K8	K8	08/18/21	7.5	Yes	3,400	59,000	4,500
S-10-K8	K8	08/18/21	10	--	1,500	4,900	270
S-12.5-K8	K8	08/18/21	12.5	--	10	44	240
S-2.5-L1	L1	08/17/21	2.5	--	0.42	16	86
S-5-L1	L1	08/17/21	5	--	210	660	380
S-7.5-L1	L1	08/17/21	7.5	--	1.3	35	59
S-10-L1	L1	08/17/21	10	--	4.9	84	51
S-12.5-L1	L1	08/17/21	12.5	--	0.50	12	8.5
S-2.5-L2	L2	10/13/21	2.5	--	98	5,400	1,400
S-5-L2	L2	10/13/21	5	--	920	8,200	8,200
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):								
S-7.5-L2	L2	10/13/21	7.5	--	<0.21	<6.2	12	
S-2.5-L3	L3	08/17/21	2.5	--	1.4	8,600	2,500	
S-5-L3	L3	08/17/21	5	--	<0.45	7,000	2,600	
S-7.5-L3	L3	08/17/21	7.5	--	0.34	170	360	
S-10-L3	L3	08/17/21	10	--	210	12	110	
S-12.5-L3	L3	08/17/21	12.5	--	<0.58	<13	140	
S-2.5-L5	L5	08/18/21	2.5	--	1,300	8,700	500	
S-5-L5	L5	08/18/21	5	--	840	4,600	280	
S-7.5-L5	L5	08/18/21	7.5	--	0.90	160	160	
S-10-L5	L5	08/18/21	10	--	89	1,700	600	
S-12.5-L5	L5	08/18/21	12.5	--	<1.3	<20	23	
S-2.5-L7	L7	08/18/21	2.5	--	410	4,700	2,000	
S-5-L7	L7	08/18/21	5	--	820	45,000	310	
S-7.5-L7	L7	08/18/21	7.5	--	290	11,000	5,100	
S-10-L7	L7	08/18/21	10	--	410	1,400	800	
S-12.5-L7	L7	08/18/21	12.5	--	<2.0	<28	73	
S-2.5-L8	L8	10/14/21	2.5	--	1.0	340b	200	
S-5-L8	L8	10/14/21	5	--	3,900	22,000b	1,300	
S-7.5-L8	L8	10/14/21	7.5	--	1,900	21,000b	890	
S-10-L8	L8	10/14/21	10	Yes	320	13,000b	920	
S-12.5-L8	L8	10/14/21	12.5	--	12	<49b	72	
S-2-L9	L9	08/18/21	2	--	96	2,000	2,100	
S-5-L9	L9	08/18/21	5	--	6.7	370	280	
S-10-L9	L9	08/18/21	10	--	1,400	310	32	
S-12.5-L9	L9	08/18/21	12.5	--	<2.0	<29	33	
S-2.5-M1	M1	10/13/21	2.5	--	4.0	460	320	
S-5-M1	M1	10/13/21	5	--	2,000	4,200	910	
S-7.5-M1	M1	10/13/21	7.5	--	25	<6.7	<6.7	
S-2.5-M2	M2	08/17/21	2.5	--	0.96	160	23	
S-5-M2	M2	08/17/21	5	--	190	1,600	650	
S-7.5-M2	M2	08/17/21	7.5	--	5.1	270	450	
S-10-M2	M2	08/17/21	10	--	89	970	420	
S-12.5-M2	M2	08/17/21	12.5	--	0.48	17	18	
S-2.5-M3	M3	10/14/21	2.5	--	2,700	16,000	830	
S-5-M3	M3	10/14/21	5	--	390	2,600	330	
S-7.5-M3	M3	10/14/21	7.5	--	16	240	280	
S-10-M3	M3	10/14/21	10	--	20	930	1,100	
S-2.5-M4	M4	08/17/21	2.5	--	<0.29	13,000	2,200	
S-5-M4	M4	08/17/21	5	--	1,100	7,900	1,400	
S-7.5-M4	M4	08/17/21	7.5	--	<0.55	5,500	7,300	
S-10-M4	M4	08/17/21	10	--	620	<6.9	13	
S-12.5-M4	M4	08/17/21	12.5	--	1.0	<15	58	
Site-Specific Residual Saturation Remediation Levels						2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-2.5-M6	M6	08/18/21	2.5	--	1,500	10,000	1,100
S-5-M6	M6	08/18/21	5	--	1,200	4,400	620
S-7.5-M6	M6	08/18/21	7.5	--	67	60	240
S-10-M6	M6	08/18/21	10	--	8.5	690	930
S-12.5-M6	M6	08/18/21	12.5	--	<1.2	120	280
S-2.5-M8	M8	08/18/21	2.5	--	3,400	27,000	1,300
S-5-M8	M8	08/18/21	5	--	1,200	250	14
S-7.5-M8	M8	08/18/21	7.5	--	490	1,300	340
S-10-M8	M8	08/18/21	10	--	740	100	11
S-12.5-M8	M8	08/18/21	12.5	--	6.0	<31	37
S-2.5-M9	M9	10/14/21	2.5	--	0.77	300b	460
S-5-M9	M9	10/14/21	5	--	4,600	5,700b	180
S-7.5-M9	M9	10/14/21	7.5	--	3,500	21,000b	1,100
S-10-M9	M9	10/14/21	10	--	2,900	35,000b	1,400
S-12.5-M9	M9	10/14/21	12.5	--	530	11,000b	1,700
S-15-M9	M9	10/14/21	15	--	46	26b	<17
S-17.5-M9	M9	10/14/21	17.5	--	0.97	<5.8b	<5.8
S-2.5-N1	N1	08/17/21	2.5	--	0.86	13	<5.7
S-5-N1	N1	08/17/21	5	--	730	160	140
S-10-N1	N1	08/17/21	10	--	1.8	14	13
S-12.5-N1	N1	08/17/21	12.5	--	<0.28	15	11
S-2.5-N3	N3	08/17/21	2.5	--	1,700H	930	9.5
S-5-N3	N3	08/17/21	5	--	880H	780	190
S-7.5-N3	N3	08/17/21	7.5	--	1.8	<6.2	<6.2
S-16-N3	N3	08/17/21	16	--	<0.28	<11	15
S-2.5-N4	N4	10/14/21	2.5	--	2,200	7,700	410
S-5-N4	N4	10/14/21	5	--	1,600	4,400	51
S-7.5-N4	N4	10/14/21	7.5	--	20	360	190
S-10-N4	N4	10/14/21	10	--	1.3	460	980
S-2.5-N5	N5	08/17/21	2.5	--	2,000	110,000	6,300
S-5-N5	N5	08/17/21	5	--	1,100H	820	51
S-7.5-N5	N5	08/17/21	7.5	--	0.87	<6.0	<6.0
S-10-N5	N5	08/17/21	10	--	9.4	32	<6.0
S-12.5-N5	N5	08/17/21	12.5	--	<0.98	<29	<29
S-2.5-N7	N7	08/17/21	2.5	--	36	6,100	2,300
S-5-N7	N7	08/17/21	5	--	1,200	1,600	37
S-7.5-N7	N7	08/17/21	7.5	--	9,500	24,000	1,000
S-10-N7	N7	08/17/21	10	--	1,400	4,400	1,800
S-12.5-N7	N7	08/17/21	12.5	--	4.4	320	190
S-2.5-O1	O1	10/14/21	2.5	--	<0.27	<51b	170
S-5-O1	O1	10/14/21	5	--	<0.25	<30b	77
S-7.5-O1	O1	10/14/21	7.5	--	3.7	14b	13
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):								
S-2.5-O2	O2	08/17/21	2.5	--	0.25	45	47	
S-5-O2	O2	08/17/21	5	--	<0.18	<12	67	
S-7.5-O2	O2	08/17/21	7.5	--	5.4	240	1,400	
S-10-O2	O2	08/17/21	10	--	1.3	<19	<19	
S-12.5-O2	O2	08/17/21	12.5	--	<0.25H	<6.3	14	
S-2.5-O3	O3	10/14/21	2.5	--	3.6	99	110	
S-5-O3	O3	10/14/21	5	--	1,500	3,200	130	
S-7.5-O3	O3	10/14/21	7.5	--	1.1	6.1	13	
S-10-O4	O4	08/17/21	10	--	66H	230	75	
S-12.5-O4	O4	08/17/21	12.5	--	1.2	<20	62	
S-2.5-O6	O6	08/17/21	2.5	--	170	1,000	1,700	
S-5-O6	O6	08/17/21	5	--	2,800	2,000	320	
S-7.5-O6	O6	08/17/21	7.5	--	200	220	<5.7	
S-7.5-O6 DUP	O6	08/17/21	7.5	--	55	1,100	26	
S-10-O6	O6	08/17/21	10	--	2,900	600	27	
S-12.5-O6	O6	08/17/21	12.5	--	210	260	210	
S-2.5-O7	O7	10/14/21	2.5	--	520	3,800b	1,600	
S-5-O7	O7	10/14/21	5	--	240	870b	3,300	
S-7.5-O7	O7	10/14/21	7.5	--	2,100	20,000b	790	
S-10-O7	O7	10/14/21	10	--	110	200b	660	
S-12.5-O7	O7	10/14/21	12.5	--	10	<53b	100	
S-2.5-O8	O8	08/16/21	2.5	--	4,100	15,000	290	
S-5-O8	O8	08/16/21	5	--	820	45,000	1,500	
S-10-O8	O8	08/16/21	10	--	1,500	2,900	180	
S-12.5-O8	O8	08/16/21	12.5	--	8.3	20	150	
S-2.5-P1	P1	08/16/21	2.5	--	22	290	960	
S-5-P1	P1	08/16/21	5	--	140	280	780	
S-7.5-P1	P1	08/16/21	7.5	--	<0.56	<11	14	
S-10-P1	P1	08/16/21	10	--	<0.76	460	840	
S-12.5-P1	P1	08/16/21	12.5	--	<0.71	<12	12	
S-2.5-P2	P2	10/14/21	2.5	--	0.23	310b	630	
S-5-P2	P2	10/14/21	5	--	1,500	4,900b	1,600	
S-7.5-P2	P2	10/14/21	7.5	--	2.9	120b	430	
S-2.5-P3	P3	08/16/21	2.5	--	800	6,100	2,400	
S-16-P3	P3	08/16/21	16	--	5.3	<17	29	
S-2.5-P4	P4	10/14/21	2.5	--	250	320b	580	
S-5-P4	P4	10/14/21	5	--	810	830b	58	
S-7.5-P4	P4	10/14/21	7.5	--	45	43b	240	
S-2.5-P5	P5	08/16/21	2.5	--	63	200	360	
S-5-P5	P5	08/16/21	5	--	2,500	3,700	250	
S-7.5-P5	P5	08/16/21	7.5	--	230	29	240	
S-10-P5	P5	08/16/21	10	--	790	190	260	
Site-Specific Residual Saturation Remediation Levels						2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-12.5-P5	P5	08/16/21	12.5	--	1.0	10	130
S-5-P6	P6	10/14/21	5	--	2,200	1,400b	990
S-10-P6	P6	10/14/21	10	--	2.0	<6.8b	12
S-12.5-P6	P6	10/14/21	12.5	--	6.0	<59b	100
S-2.5-P7	P7	08/16/21	2.5	--	110	2,800	1,500
S-5-P7	P7	08/16/21	5	--	870	4,300	460
S-7.5-P7	P7	08/16/21	7.5	--	1,000	3,700	200
S-10-P7	P7	08/16/21	10	--	260	830	310
S-12.5-P7	P7	08/16/21	12.5	--	3.0	1,700	4,000
S-2.5-Q1	Q1	10/14/21	2.5	--	<0.36	<5.3	<5.3
S-5-Q1	Q1	10/14/21	5	--	2.5	<6.1	<6.1
S-7.5-Q1	Q1	10/14/21	7.5	--	0.33	<5.9	38
S-2.5-Q2	Q2	08/16/21	2.5	--	53	150	240
S-5-Q2	Q2	08/16/21	5	--	1.3	<5.9	76
S-7.5-Q2	Q2	08/16/21	7.5	--	0.58	<6.1	11
S-10-Q2	Q2	08/16/21	10	--	<0.20	<6.2	6.8
S-12.5-Q2	Q2	08/16/21	12.5	--	<0.21	<6.1	7.5
S-2.5-Q3	Q3	10/14/21	2.5	--	9.3	<6.6	9.8
S-5-Q3	Q3	10/14/21	5	--	530	810	190
S-7.5-Q3	Q3	10/14/21	7.5	--	110	340	61
S-2.5-Q4	Q4	08/16/21	2.5	--	2.1	20	17
S-5-Q4	Q4	08/16/21	5	--	7.3	100	210
S-7.5-Q4	Q4	08/16/21	7.5	--	0.34	22	100
S-10-Q4	Q4	08/16/21	10	--	0.27	<6.0	<6.0
S-12.5-Q4	Q4	08/16/21	12.5	--	<0.47	28	56
S-5-Q5	Q5	10/15/21	5	--	1.5	<31	68
S-7.5-Q5	Q5	10/15/21	7.5	--	0.45	<6.3	<6.3
S-7.5-Q5 DUP	Q5	10/15/21	7.5	--	0.44	<5.6	<5.6
S-2.5-Q6	Q6	08/12/21	2.5	--	2,100	6,000	170
S-5-Q6	Q6	08/12/21	5	--	590	3,400	140
S-7.5-Q6	Q6	08/12/21	7.5	--	0.80	<6.1	<6.1
S-10-Q6	Q6	08/12/21	10	--	130	6.3	<6.1
S-12.5-Q6	Q6	08/12/21	12.5	--	33	9.5	8.1
S-2.5-R1	R1	08/12/21	2.5	--	190	1,300	640
S-5-R1	R1	08/12/21	5	--	0.51	<6.0	<6.0
S-7.5-R1	R1	08/12/21	7.5	--	1.2	66	220
S-10-R1	R1	08/12/21	10	--	0.36	63	200
S-12.5-R1	R1	08/12/21	12.5	--	<0.58	<25	300
S-2.5-R3	R3	08/12/21	2.5	--	0.55	<6.5	<6.5
S-5-R3	R3	08/12/21	5	--	0.74	32	480
S-7.5-R3	R3	08/12/21	7.5	--	<0.14	<5.9	<5.9
S-10-R3	R3	08/12/21	10	--	<0.11	<5.9	<5.9
Site-Specific Residual Saturation Remediation Levels					2,470	4,800	5,810

**TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
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Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
Stantec - Site Characterization/Focused Feasibility Study Addendum - May 25, 2023 (continued):							
S-12.5-R3	R3	08/12/21	12.5	--	<1.3	<19	110
S-5-R4	R4	10/15/21	5	--	4.7	<6.3	40
S-7.5-R4	R4	10/15/21	7.5	--	1.7	<29	260
S-2.5-R5	R5	08/12/21	2.5	--	1.0	7.5	17
S-10-R5	R5	08/12/21	10	--	38	140	130
S-10-R5 DUP	R5	08/12/21	10	--	450	140	130
S-12.5-R5	R5	08/12/21	12.5	--	15	<6.3	7.7
S-7.5-R5A	R5A	10/15/21	7.5	--	2.1	<6.0	<6.0
S-2.5-S1	S1	10/14/21	2.5	--	<0.24	<13	62
S-5-S1	S1	10/14/21	5	--	<0.20	<5.7	<5.7
S-7.5-S1	S1	10/14/21	7.5	--	0.24	<5.8	<5.8
S-2.5-S2	S2	08/12/21	2.5	--	0.39	21	120
S-5-S2	S2	08/12/21	5	--	0.25	15	140
S-7.5-S2	S2	08/12/21	7.5	--	<0.20	<5.8	<5.8
S-10-S2	S2	08/12/21	10	--	0.21	20	49
S-12.5-S2	S2	08/12/21	12.5	--	<0.50	<14	74
S-2.5-S4	S4	08/12/21	2.5	--	0.60	<6.2	<6.2
S-5-S4	S4	08/12/21	5	--	0.25	<5.9	23
S-7.5-S4	S4	08/12/21	7.5	--	<0.23	<6.2	<6.2
S-10-S4	S4	08/12/21	10	--	0.12	10	180
S-12.5-S4	S4	08/12/21	12.5	--	<0.97	<18	220
S-2.5-T1	T1	08/16/21	2.5	--	0.29	20	59
S-5-T1	T1	08/16/21	5	--	<0.21	19	18
S-7.5-T1	T1	08/16/21	7.5	--	<0.11	13	12
S-10-T1	T1	08/16/21	10	--	<0.77	17	33
S-12.5-T1	T1	08/16/21	12.5	--	<0.88	<23	25
S-2.5-T3	T3	08/16/21	2.5	--	<0.20	6.3	8.3
S-5-T3	T3	08/16/21	5	--	<0.19	<5.6	6.0
S-7.5-T3	T3	08/16/21	7.5	--	<0.11	16	13
S-10-T3	T3	08/16/21	10	--	<0.23	220	1,400
S-12.5-T3	T3	08/16/21	12.5	--	<0.73	<20	49

Site-Specific Residual Saturation Remediation Levels	2,470	4,800	5,810
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TABLE 1
EXCAVATION DELINEATION SOIL ANALYTICAL RESULTS - EXXONMOBIL ADC

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
Page 14 of 14

Sample Name	Location	Date	Sample Depth (feet bgs)	LNAPL Observed	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)
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EXPLANATION:

feet bgs = Feet below ground surface

mg/kg = Milligrams per kilogram

LNAPL = Light Non-aqueous Phase Liquid

TPHg = Total Petroleum Hydrocarbons as Gasoline in accordance with Ecology Method NWTPH-Gx

TPHd, TPHmo = Total Petroleum Hydrocarbons as Diesel and as Oil, respectively, in accordance with Ecology Method NWTPH-Dx

All TPHd and TPHmo samples analyzed with silica gel cleanup

< = Less than the stated laboratory reporting limit

-- = Not Observed; Not Analyzed

Shaded values equal or exceed Site-Specific Residual Saturation Remediation Level

a = Sample aliquot taken from unpreserved jar; analytical method specifies methanol or sodium bisulfate preservation

b = TPHd detected in equipment blank sample

H = Sample was prepped or analyzed beyond the specified holding time

APPENDIX A

Wood's Chronology of Historical On-Site Environmental Investigations (WSP, 2023)



TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
May-85	RZA	ExxonMobil Parcel	RZA 1985	Borings, monitoring well installation	2-inch-diameter monitoring wells B-1 through B-5 (MW-1 through MW-5 in several reports) installed.	B-1, B-2, B-4, and B-5; Petroleum odor noticed in borings; evidence found of contamination below groundwater table.
Mar-88	RZA	ExxonMobil Parcel	AMEC E&E 2010a	Borings, monitoring well installation	2-inch-diameter monitoring wells MW-6 through MW-18 installed.	Soil and groundwater samples collected. LPH (1.29 feet) measured in MW-14.
Jan-90	ESE	ADC Parcel	AMEC E&E 2010a	Borings	Hand augers AD-01 through AD-19 to depths ranging from 1 to 4.5 feet.	Soil samples collected.
Feb-90	ESE	ADC Parcel	AMEC E&E 2010a	Borings, monitoring well installation	HSA borings W-1 through W-7; 2-inch-diameter monitoring wells W-1 through W-6 installed.	W-7 was backfilled.
Jun-90	ESE	ADC Parcel	AMEC E&E 2010a	Hand-auger borings	Hand-auger borings W-8 through W-17 to depths of 6-10 feet.	No soil data found for W-8 through W-17. Gauging data indicate that free product was observed in 10 of the 17 monitoring wells located at and around the ADC Parcel.
Oct-90	RZA	ExxonMobil Parcel	AMEC E&E 2010a	Shallow grid soil sampling, bio-feasibility study	Hand augers B-1 through B-25; Two soil samples were studied to conduct a slurry flask bio-feasibility study.	0-3 feet bgs. Rapid biodegradation of TPH-G fraction was observed. Biodegradation of TPH (undifferentiated) was not achieved.
Nov-90	Unknown	ExxonMobil Parcel	AMEC E&E 2010a	Monitoring well decommissioning	B-3 (MW-3), B-4 (MW-4), and MW-7 destroyed.	No documentation of well decommissioning.
March-June 1991	RZA	Parcels surrounding ExxonMobil Parcel	AMEC E&E 2010a	Borings, monitoring well installation	Six percussion soil borings to depths ranging from 5 to 5.5 feet bgs. 2-inch diameter monitoring wells MW-19 through MW-24, and 4-inch diameter monitoring wells MW-27 through MW-30 installed. Soil boring B-21-91 advanced to depth of 29 feet bgs.	MW-25 and MW-26 were inaccessible or dry and later renamed as B-25 and B-26. No well decommissioning records were found.
Jun-91	RZA and ESE	The Property	AGRA 1996g	Quarterly groundwater monitoring	Groundwater monitoring event. New 2-inch diameter monitoring wells MW-25 and MW-26 installed. Gauged wells: RW-1, B-1, B-2, B-5, MW-6, MW-8 through MW-13, MW-15 through MW-18, AD-19, W-1 through W-6, and W-8 through W-15.	B-1, MW-8, AD-19, W-1, W-6, W-9, W-11, W-12, W-13, and W-15 contained LPH and were not sampled.
Nov-91	RZA AGRA	ExxonMobil Parcel	AMEC E&E 2010a	Borings, recovery well	8-inch diameter recovery well RW-2 installed. Deep soil borings B-1A, B-8A, and B-15A advanced.	Soil borings advanced in vicinity of existing wells B-1, B-8, and B-15. No analytical data found for this event.

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
Dec-91	RZA-AGRA	ExxonMobil Parcel	AGRA 1996g	Quarterly groundwater monitoring, aquifer and tidal study	Quarterly groundwater monitoring. Gauged wells: RW-1, B-1, B-2, B-5, MW-6, MW-8 through MW-13, MW-15 through MW-30, and AD-19. Aquifer study involved 24-hour pumping from MW-10 at a rate of 1 to 2 gpm and measuring response in MW-18, RW-1, and RW-2 for 48 hours.	B-1, MW-8, MW-11, MW-26, MW-27, MW-29, and AD-19 contained LPH and were not sampled. Hydraulic conductivity at the Site was estimated as 4 to 9.5 feet/day. Minimum tidal influence was observed.
1992	RZA-AGRA	NA	NA	Discussions with Ecology	Ecology discussed enforcement with Mobil and RZA AGRA. Ecology decided to allow Site to go independent.	
Dec-93	RZA-AGRA	West of ExxonMobil Parcel	AMEC E&E 2010a	Off-Property borings, monitoring well installation, GPR survey	2-inch diameter monitoring wells MW-31 through MW-33 and MW-35 through MW-37 were installed; B-34 advanced and backfilled. GPR survey was conducted to assess whether underground product lines had been removed.	Survey did not identify any subsurface linear features.
Dec-93	RZA-AGRA	ExxonMobil Parcel and off-Property to the west	AGRA 1996g	Quarterly groundwater monitoring	Groundwater monitoring event. Gauged wells B-1, B-2, MW-6, MW-8 through MW-13, MW-15 through MW-18, MW-27 through MW-33, MW-35 through MW-37.	B-1, MW-27, and MW-29 contained LPH and were not sampled.
Dec-93	RZA-AGRA	West of ExxonMobil Parcel	AMEC E&E 2010a	Test pits, recovery trench	Excavated five test pits, TP-1 through TP-5, to depths ranging from 3 to 3.5 feet bgs. Recovery trench installed along the western border of ExxonMobil Parcel.	Monitoring well MW-21 was reportedly decommissioned during the recovery trench installation activities. However, a 2002 decommissioning record was found that stated that MW-21 was decommissioned in 2002.
1995			NA	Agreed Order DE-95TC-N402		Required evaluation of LPH.
Jul-95	RZA-AGRA	ADC Parcel	AGRA 1996g	Quarterly groundwater monitoring	Groundwater monitoring event. Gauged wells: W-3, W-5, W-9, W-10, W-12 through W-15.	W-9, W-12, and W-13 contained LPH and were not sampled.
Oct-95	U.S. Coast Guard Puget Sound Marine Safety Office & City of Everett	North of the Property	AMEC E&E 2010a	Investigation of petroleum product discharge into Everett Harbor	Camera surveys of the sewer lines made.	Outfall located approximately 175 yards northwest of the ADC Parcel; LPH seepage observed in section of CSO line.
Nov-95	RZA-AGRA	Site	AGRA 1996g	Groundwater monitoring	Groundwater monitoring event. Gauged wells: RW-1, RW-2, B-1, B-2, MW-6, MW-8 to MW-13, MW-15 to MW-18, MW-27 to MW-37, and NRW-1.	B-1, MW-18, MW-29, and MW-30 contained LPH and were not sampled.

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
Dec-95	RZA AGRA	Site	AGRA 1996g	Groundwater monitoring	Groundwater monitoring event. Gauged wells: RW-2, B-2, MW-8, MW-9, MW-18, MW-15 through MW-18, MW-27, and MW-28.	RW-2, MW-9, MW-18, and MW-28 contained LPH and were not sampled.
Mar-96	AGRA	North of the Property	AMEC E&E 2010a	Borings	Direct-push soil borings GP-1 through GP-13. Borings associated with the CSO line repair.	The collected soil sample results indicated that soil surrounding the damaged portion of the CSO had petroleum hydrocarbon impacts. LPH accumulation was noticed in temporary screens installed in soil borings. No groundwater samples were collected from temporary screens.
Apr-96	City of Everett		AMEC E&E 2010a	Meeting	Meeting held to discuss options for repairing the section of CSO line.	Decisions made regarding replacement of the settled portion of the line and slip lining of the remaining portion of the line.
May-96	AGRA	ADC Parcel	AGRA 1996d	Borings	Bobcat borings BB-1 through BB-14.	Soil samples collected.
Jun-96	AGRA	ADC Parcel	AGRA 1996d	Borings, monitoring wells, and test pits	4-inch diameter recovery well VRW-1 and 2-inch diameter monitoring well MW-38 installed. Seven test pits TP-1-96 through TP-7-96 excavated.	Wells were installed on the northeast corner of the property. Test pits were located throughout the ADC Parcel.
Aug-96	AGRA	Site	AMEC E&E 2010a	Monitoring wells	Gauged wells at the property.	LPH found in B-1, VRW-1, MW-27, MW-29, MW-30, MW-38, W-1, W-9, W-15.
Feb-97	PTI	Site	PTI 1997	LPH recovery technical memorandum	Technical memorandum to summarize environmental investigations, LPH recovery activities, and geology.	PTI concluded that long-term, passive (LPH only) recovery may be the most effective method of LPH recovery. PTI also concluded that active LPH and groundwater recovery that had been performed up to that time had been effective for short durations, but recovery structures did not continue to recover LPH for extended periods of time when active recovery was employed.

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
November 1997 through January 1998	Pacific Environmental Group, Inc.	Kimberly-Clark property	Pacific Environmental Group, Inc. 1998	Borings, monitoring wells	Direct-push borings Probe-1 through Probe-15 were advanced, and 2-inch diameter HSA monitoring wells KC-1 and KC-2 were installed inside the KC warehouse.	Groundwater samples were collected from temporary screens installed in each boring. LPH not identified in soil borings or monitoring wells. TPH-D and TPH-O were detected above MTHA Method A cleanup levels in borings advanced in the vicinity of repaired CSO line. Samples not collected in vicinity of former ASTs.
1998			NA	Agreed Order DE98TC-P-N223		Required remedial investigation/focused feasibility study.
Jul-98	Exponent	Site	Exponent 1998a	Remedial Investigation and Focused Feasibility Study	Exponent summarized the history of the Property and evaluated feasible remedial options for the Site.	Exponent recommended the installation of LPH recovery trenches and installation of a low-permeability cap over the property.
Jul-98	Exponent	Site	Exponent 1998b	Final Interim Action Work Plan and Engineering Design Report	Exponent presented design for interim measures at the Property.	Exponent provided specifications for demolition of existing Site structures and installation of LPH recovery trenches, water treatment system, and low-permeability cap over the Property.
Oct-99	Kleinfelder	The Property	Exponent 2000	Monitoring wells installation	Monitoring wells W-10R, W-15R, and MW-40R.	Wells installed to replace wells W-10, W-15, and MW-40.
Dec-99	Dames and Moore/URS	South and southeast of the Property	URS 2000a	Geotechnical drilling and piezometer installation	DM-6, DM-7, and DM-8 were sampled for environmental samples.	Work associated with CSTO Project.
Sep-00	URS	South, east, and southeast of the Property	URS 2000b	Borings	Phase II investigation for the CSTO Project. Push-probe borings UG-1 through UG-12.	Groundwater samples collected from temporary screens installed in UG-2 and UG-8. Estimated 7,600 cubic yards of petroleum-contaminated soil present along the overcrossing alignment.
Jul-01	URS	Johnston Petroleum parcel	URS 2001a and b	Borings	Phase II investigation for Johnson Petroleum parcel. Push-probe borings JP-1 through JP-7.	Soil samples collected. Groundwater samples collected from JP-1, JP-4, and JP-7. No significant contamination found.

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
Feb-02	ERI	Site and vicinity	ERI 2002a	Monitoring well decommissioning and re-installment	Abandonment of monitoring wells (MW-22, MW-23, MW-24, MW-35, and MW-37) and piezometer DM-6 due to proximity to the CSTO Project. Re-installed well W-2 screened from 3 to 23 feet bgs.	No soil samples taken during W-2 installation. The reported abandonment of MW-21 in 2002 contradicts the reported decommissioning of MW-21 due to installation of the recovery trench to the west of the Property in December 1995.
2002	Reid Middleton	CSTO	Reid Middleton 2002	Memorandum to Ecology	Southeast corner of the asphalt cap over the ExxonMobil Parcel removed. Steel piles for concrete foundation were installed.	No information regarding contaminant soil excavation and removal was found.
2002-2007	Kleinfelder, ERI, AMEC	Site	Various	Groundwater monitoring	Monthly LPH gauging and quarterly groundwater monitoring.	LPH greater than 0.02 foot thick is bailed manually and oleophilic socks are replaced.
Jul-02	ERI	West of the ExxonMobil Parcel	ERI 2002b	Well decommissioning	Monitoring wells MW-20, MW-21, and one unidentified well were decommissioned.	The record contradicts the records that indicate that MW-21 was decommissioned during the December 1993 recovery trench installation.
Feb-07	AMEC/Bravo Environmental	Site	AMEC E&E 2007	Video survey of storm drain system	AMEC contracted Bravo to conduct a video survey of the storm drain system installed as part of 1999 interim measure to verify that groundwater from the Property is not infiltrating into the stormwater system through possible cracks and fissures in the piping and catch basins.	No significant cracks or fissures within the stormwater system were observed.
2007-present	AMEC	Site	AMEC E&E 2010a	Groundwater monitoring	AMEC requested to change to semiannual groundwater monitoring in 2007.	Request was accepted by Ecology.
2008	AMEC	West of the Property	AMEC E&E 2008b	Monitoring wells	Off-property monitoring wells MW-A1 and MW-A2 installed on the west side of Federal Avenue.	Monitoring wells MW-A1 and MW-A2 are incorporated into existing groundwater monitoring network.
Feb-08	AMEC	Site	AMEC E&E, 2008a	Tidal study	Measured tidal response in W-3, W-6, MW-11, MW-28, & MW-40R.	Minimal response in each well, except MW-11.
Jun-08	AMEC	Site	2010 updated survey included as Appendix C	Well head elevations survey	True North Land Surveying of Seattle, Washington, surveyed recovery and monitoring wells located on-Site.	Recovery wells LPH-1 to LPH-9 and monitoring wells W-1, W-2, W-3, W-6, W-10R, MW-10, MW-11, W-15R, W-17, RW-2, MW-19, MW-27, MW-28, MW-29, MW-30, MW-40R, MW-A1, and MW-A2.

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
 ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
2010	AMEC	Site	AMEC E&E 2010a	Focused Feasibility Study Work Plan	Summarized Site history, previous environmental investigations and interim remedial activities, known environmental conditions, preliminary conceptual site model, and remaining data gaps.	FFS Work Plan included a sampling and analysis plan to guide data gaps investigation and identified applicable remedial technologies to be evaluated in the FFS.
2010	AMEC	Site	AMEC E&E 2010a	Agreed Order DE 6184		Required FFS and Draft CAP.
2010	AMEC	Site	AMEC E&E 2011f	Sampling for City of Everett Force Main	Borings CE-1 to CE-8 advanced on Federal Avenue, former Everett Avenue, and the BNSF property to characterize soils in the alignment of City's planned force main.	Analytical results were provided to City of Everett and used to characterize soil excavated for the force main project for disposal purposes.
2011	AMEC	Site	AMEC E&E 2011b	Data gaps investigation	Seven deep borings (AB-1 to AB-5, AP-6, MW-7ab), six shallow borings (AP-1 through AP-5, AP-7), five new off-Property monitoring wells (MW-A3 through MW-A7), aquifer testing, and tidal influence study.	A plume of groundwater with petroleum hydrocarbon impacts was identified west & northwest of the Property. Groundwater downgradient and upgradient from the Property was not affected by COCs. Geochemical parameters were consistent with an anaerobic environment in which active petroleum biodegradation appears to be occurring. No continuous silt layer was identified beneath the Property. Monitoring wells MW-A3 through MW-A7 incorporated into existing groundwater monitoring network.
2011	AMEC	Site	AMEC E&E 2011a	Tidal influence investigation	A stilling well with transducer was installed on the Everett Pier to automatically record tidal elevations. Pressure transducer/data loggers were installed in monitoring wells W-3, W-6, MW-11, MW-19, MW-20, MW-40R, and MW-A1 through MW-A7 to record groundwater levels every 6 minutes for 6 days.	Monitoring wells W-3, MW-11, MW-A1, MW-A2, MW-A3, MW-A5, and MW-A6 are tidally influenced, with tidal fluctuations ranging from 0.1 foot to 1.1 feet. MW-19, MW-28, MW-40R, MW-A4, and W-6 exhibited minimal tidal influence, and MW-A7 was unaffected by tidal elevation. A potentiometric surface map showed groundwater flow toward the west.
2011	AMEC	Former Everett Avenue	AMEC E&E 2011g and h	Observations of seeps along former Everett Avenue	AMEC recorded photographs in the field to document observations of petroleum product seeps through the pavement on former Everett Avenue.	

TABLE 3-1: CHRONOLOGY OF HISTORICAL ON-SITE ENVIRONMENTAL INVESTIGATIONS
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
2012	AMEC	Federal Avenue and former Everett Avenue	AMEC 2012b	Observations during City of Everett force main replacement	AMEC observed excavation and drilling activities during installation of the City's force main and recorded notable subsurface features when relevant, including the presence of LPH if encountered.	AMEC documented the presence of LPH in borings and/or trenches along much of the alignment on former Everett Avenue, and at selected locations along Federal Avenue.
2013-2014	AMEC	Site	AMEC 2014a	Data gaps investigation	A total of 33 soil borings were drilled on the Property and nearby properties, and soil samples were analyzed to delineate areas of affected soil at the Site. One of the borings was completed as a new monitoring well (MW-A8).	Higher COC concentrations were found primarily on the Property and in the western portion of the former ADC garage. Contamination from the Site extends to the former ADC garage and former Everett Avenue. Contamination on KC property north of former Everett Avenue likely originates from sources on the KC property. Monitoring well MW-A8 incorporated into groundwater monitoring network.
2020-2021	Cardno	Port of Everett	Appendix F	Excavation delineation	A total of 51 soil borings were drilled on the Port of Everett property, and soil samples were analyzed to delineate areas exceeding remediation levels for future excavation. Two geotechnical borings were also advanced. Analytical results will be used so that collection of sidewall and base soil samples during future excavation work is not necessary.	COC concentrations exceeding remediation levels are present as deep as 16 feet bgs.

Abbreviations

ADC = American Distributing Company
AMEC = AMEC Environment & Infrastructure, Inc.
AMEC E&E = AMEC Earth & Environmental, Inc.
AST = aboveground storage tank
bgs = below ground surface
CAP = Cleanup Action Plan
COC = constituent of concern
CSO = combined sewer overflow
CSTO = California Street Overcrossing
Ecology = Washington State Department of Ecology
ERI = Environmental Resolutions, Inc.
ESE = Environmental Science and Engineering, Inc.
FFS = Focused Feasibility Study
gpm = gallons per minute

GPR = ground penetrating radar
HSA = hollow-stem auger
KC = Kimberly-Clark
Kleinfielder = Kleinfielder, Inc.
LPH = liquid petroleum hydrocarbons
MTCA = Model Toxics Control Act
PTI = PTI Environmental Services
RZA = Ritterhouse-Zeman & Associates, Inc.
RZA AGRA = RZA AGRA Earth & Environmental, Inc.
TPH = total petroleum hydrocarbons
TPH-D = total petroleum hydrocarbons-diesel range organics
TPH-G = total petroleum hydrocarbons-gasoline range organics
TPH-O = total petroleum hydrocarbons-residual range organics

APPENDIX B

Wood's Chronology of Historical Interim Remedial Measures (WSP, 2023)



TABLE 4-1: CHRONOLOGY OF HISTORICAL INTERIM REMEDIAL MEASURES
ExxonMobil/ADC Property, Ecology Site ID 2728, Everett, Washington

Date	Consultant	Location	Reference	Activities	Tasks Performed	Notes
April-May 1988	RZA	ExxonMobil Parcel	PTI 1997	Recovery trench installation, SVE and groundwater treatment system test (oil-water separator and air stripper), infiltration gallery, pumping subsurface fluids	Installation of recovery trench near MW-14, SVE system and groundwater treatment system to evaluate feasibility of extracting LPH. Infiltration gallery installed in the vicinity of MW-14. Subsurface fluids were pumped with a vacuum truck from the sumps.	Decommissioned in 1998 during construction of low-permeability cap at the Property. The gallery was T-shaped and 45 feet long with two 55-gallon drums installed at both ends as sumps. 1,400 gallons of liquid removed. 50 gallons was LPH. As a result, LPH thickness in MW-14 decreased to 0.40 foot by August 1988.
Mar-89	RZA	ExxonMobil Parcel	RZA 1989	Automated groundwater extraction and treatment system	An automated groundwater extraction and treatment system was installed in the location of the infiltration gallery. The system included fluid extraction sump stationed in RW-1 (formerly MW-14), oil-water separator, air stripper, and re-infiltration gallery.	The groundwater extraction and treatment system was shut down in March 1990 due to flooding of the re-infiltration gallery, and has not been restarted.
Nov-91	RZA AGRA	ExxonMobil Parcel	PTI 1997	Borings, recovery well	8-inch diameter recovery well RW-2 installed.	No analytical data found for this event.
Dec-93	RZA AGRA	West of ExxonMobil Parcel	AGRA 1993	Test pits, recovery trench	Recovery trench installation along the western border of ExxonMobil Parcel.	
Jun-96	AGRA	North of the Property	AGRA 1996b and c	CSO line repairs	Excavation of settled portion of pipe replaced. Slipping of remaining CSO line. CSO line excavation dewatering.	1,450,800 gallons of groundwater and 23,050 gallons of LPH were removed during CSO line excavation and dewatering.
Jun-96	AGRA	LPH Vacuum Recovery Pilot Test	AGRA 1996a, d,e, and f	LPH vacuum recovery pilot test	14-day test included SVE and groundwater/LPH pumping system.	125 gal of LPH and 28,228 gallons of groundwater removed from VRW-1 during test.
Nov-98	Kleinfelder	ADC Parcel	Exponent 2000	Survey, geotechnical evaluation	Initial survey. Asbestos survey prior to demolition.	Demolition activities included four buildings on the ADC parcel. Asbestos abatement activities were conducted in November 1998, and demolition was completed in January 1999.
Dec-98	Kleinfelder	Water management and treatment system	Exponent 2000	Installation of treatment system	A water management and treatment system consisting of an oil-water separator, a settling tank, and a carbon polishing unit was constructed at the Property.	System treated approximately 2.5 million gallons of water between December 1998 and September 1999. Approximately 19,900 gallons of oily water and 450 gallons of sludge were collected between December 1998 and September 1999.
Dec-98	Kleinfelder	The Property	Exponent 2000	Interim remedial action	Removed TPH-impacted soil, graded the property, removed purge water.	162 tons of contaminated shallow soil and vegetation removed from within the ADC firewall area during demolition and transported to TPS Technologies facility for disposal. 3.5 tons of class 3 PCS taken to CRS Associated. Marine Services, Inc. removed 110 gallons of purge water.
1999	Kleinfelder	The Property	Exponent 2000	Interim remedial action	Monitoring well abandonment. Interceptor trench construction along the western and northern property boundaries. Low-permeability cap construction over the property. Recovery wells LPH-1 through LPH-9 installed in interceptor trench. Stormwater collection system that connects to the City of Everett sewer system was installed.	Monitoring wells MW-6, MW-8, MW-9, MW-12, MW-13, MW-15, MW-16, MW-17, MW-38, WP-1, B-1, B-2, W-4, W-8, W-11, W-12, W-14, AD-11, AD-12, AD-13, AD-15, AD-19, W-10, W-15, and MW-40 abandoned. Completed Site grading, installation of two layers of geotextile fabric, asphalt-treated base material, and paving fabric and asphalt cap.
2002-present	Kleinfelder, ERI, AMEC E&E	Site	Various	Petroleum recovery	Monthly removal of LPH.	LPH greater than 0.02 foot thick is bailed manually, and oleophilic socks are replaced.
Jul-08	Floyd Snider	North-northeast of the Property	AMEC E&E 2010a	Excavation and disposal of PCS and dewatering the excavation	Soil associated with Puget Sound Outfall 5 Overflow Structure project was excavated and disposed of. In addition, dewatering occurred during excavation.	Soil was field screened. Soil exhibiting obvious signs of contamination was disposed of as Class II soil without sampling. Soil that appeared to be "clean" was sampled and then disposed as Class II soil. Water from the excavation was sampled for the City sewer discharge requirements.
2010	AMEC E&E	Federal Avenue and Port of Everett property	AMEC E&E 2011e	Removal of abandoned pipes and affected soil	AMEC decommissioned pipelines west of the Property to prepare for upgrades to the storm sewer line planned by the City of Everett.	A total of 76.55 tons of construction debris, 243 tons of soil, 487 linear feet of piping, 65,669 gallons of non-regulated liquid, four 55-gallon product/ water drums, and four 55-gallon solid waste drums were removed and disposed of off Site. Samples from base of excavation showed contaminated soil left in place.
2011-2012	AMEC	BNSF and KC properties	AMEC 2012a	Interim removal action	Excavation and off-Site disposal of surface asphalt, affected soil, and recovered LPH and treatment of the recovered groundwater from the secondary source areas on the BNSF and KC properties. Monitoring wells MW-27 through MW-30 abandoned.	Approximately 3,785 tons of material was excavated and disposed of at a permitted landfill, approximately 2,530 gallons of LPH was removed, and 1,489,246 gallons of petroleum-affected groundwater was removed and treated. Affected material was evident and left in place at all side wall areas of the completed excavation on the BNSF property and on the north and east sidewalls on the KC property.

Abbreviations

ADC = American Distributing Company
 AMEC = AMEC Environment & Infrastructure, Inc.
 AMEC E&E = AMEC Earth & Environmental, Inc.
 BNSF = BNSF Railway Company
 CSO = combined sewer outflow
 ERI = Environmental Resolutions, Inc.
 KC = Kimberly-Clark
 Kleinfelder = Kleinfelder, Inc.

LPH = liquid petroleum hydrocarbons
 PCS = petroleum-contaminated soil
 PTI = PTI Environmental Services
 RZA = Rittenhouse-Zeman & Associates, Inc.
 RZA AGRA = RZA AGRA Earth & Environmental, Inc.
 SVE = soil vapor extraction
 TPH = total petroleum hydrocarbons

APPENDIX C

Excavation Delineation Boring Logs



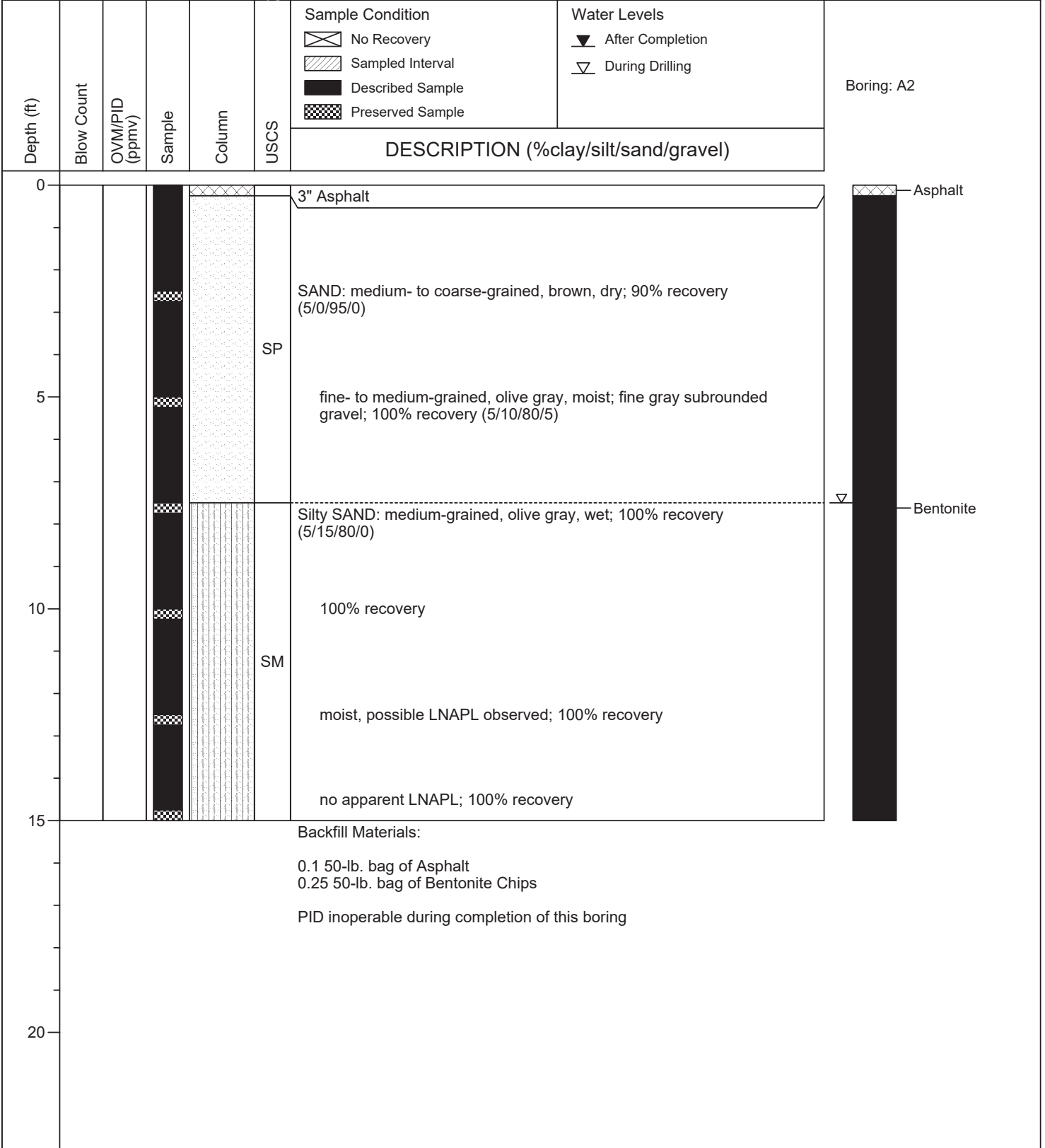


BORING LOG A2

(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 7.5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*





BORING LOG A4

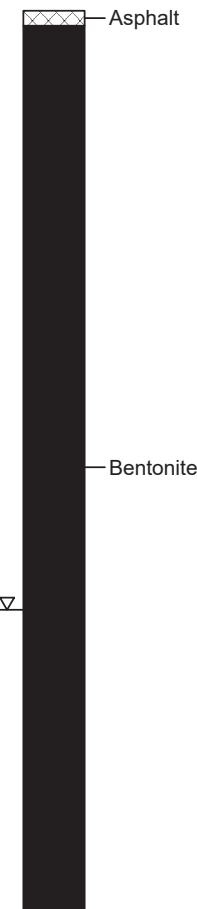
(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SP			SAND: medium- to coarse-grained, brown, dry; fine gray subrounded gravel; 50% recovery (5/10/75/10)
5 - 10					SP			SAND with Gravel: medium- to coarse-grained, olive gray, damp; coarse gray subangular gravel; 75% recovery (5/10/70/15) No recovery
10 - 12.5					SM			Silty SAND: coarse-grained, olive gray, wet; 30% recovery (10/20/70/0)
12.5 - 15					SC			Clayey SAND: medium-grained, gray, damp; red brown clay with wood fibers; 80% recovery (30/10/60/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: A4





BORING LOG A6

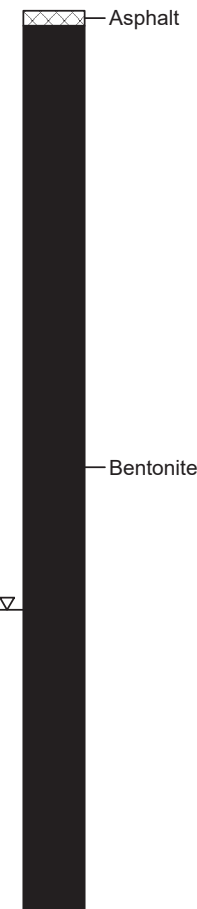
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 3								Silty SAND: medium-grained, olive gray, moist, LNAPL observed; 70% recovery (0/20/80/0)
3 - 5								medium- to coarse-grained, damp; LNAPL observed; 75% recovery
5 - 10					SM			LNAPL observed; 70% recovery
10 - 12								fine- to medium-grained, wet, no LNAPL observed; 90% recovery (10/40/50/0)
12 - 15								dark gray, moist; 90% recovery (0/40/60/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: A6





BORING LOG A8

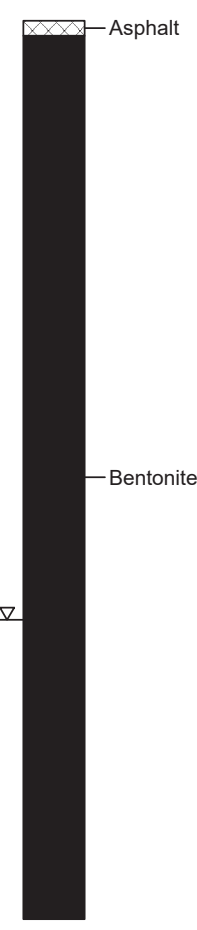
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5								Silty SAND: fine- to medium-grained, gray, damp; fine gray subrounded gravel; 60% recovery (10/40/45/5)
5 - 10					SM	No recovery		No recovery
10 - 15								fine-grained, saturated, LNAPL observed from 10 to 14' bgs; no gravel; 50% recovery (10/40/50/0)
15 - 20					ML			fine- to medium-grained, damp; fine gray subrounded gravel; 50% recovery (10/40/45/5)
15 - 20								Clayey SILT: red brown with black coating, damp; wood fibers; 50% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: A8





BORING LOG B1

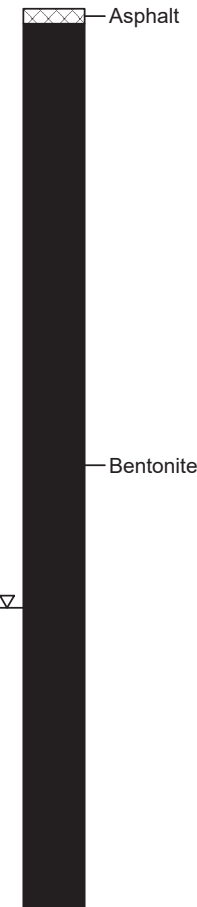
(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SP			SAND: medium- to coarse-grained, brown, dry; 70% recovery (5/0/95/0)
5 - 10								Silty SAND: medium- to coarse-grained, olive brown, moist; 100% recovery (5/20/75/0)
10 - 15					SM			olive gray; coarse gray rounded gravel; 100% recovery (0/20/70/10)
15 - 20								dark gray, wet; no gravel; 100% recovery (5/20/75/0)
20 - 25								fine- to medium-grained, gray, moist; 100% recovery (0/25/75/0)
Backfill Materials:								
0.1 50-lb. bag of Asphalt								
0.25 50-lb. bag of Bentonite Chips								
PID inoperable during completion of this boring								

Boring: B1





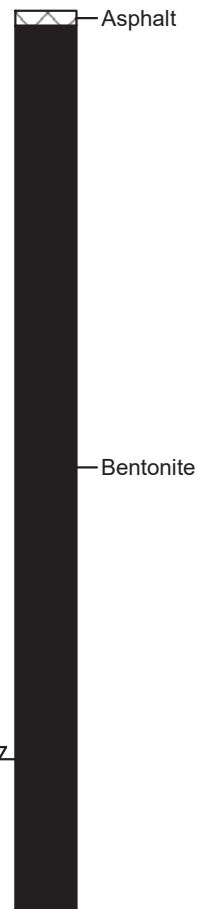
BORING LOG C2

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 12.5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						☒ No Recovery ▨ Sampled Interval ■ Described Sample ▣ Preserved Sample	▼ After Completion ▽ During Drilling	
Boring: C2								
0								3" Asphalt
					GP			GRAVEL: fine to coarse, gray, damp, poorly graded, well rounded; 35% recovery (0/0/0/100)
5		0.5			GW			GRAVEL with Sand: fine to coarse, black, moist, well graded, fine angular gravel, coarse well rounded gravel; fine- to coarse-grained well graded sand; 50% recovery (0/0/20/80)
		23.8			SM			Silty SAND: medium- to coarse-grained, dark brown, moist, moderately graded; 50% recovery (0/15/85/0)
10		2.1			SP			SAND: medium- to coarse-grained, dark brown, moist, poorly to moderately graded; 75% recovery (0/10/90/0)
		6.7			SM			Silty SAND: medium- to coarse-grained, dark brown, moist to wet, moderately graded; 100% recovery (0/15/85/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								





BORING LOG C4

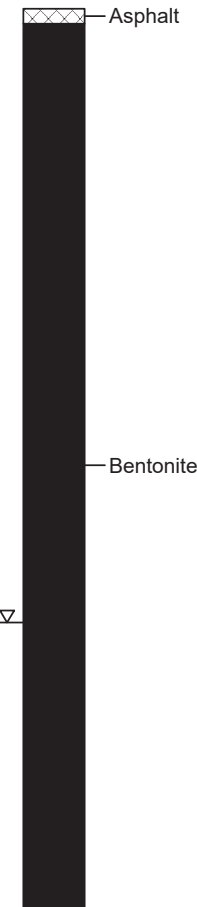
(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10.25' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
					GP			GRAVEL: fine to coarse, gray, damp, well rounded, poorly to moderately graded; 35% recovery (0/0/0/100)
5		36.5			SW			SAND with Gravel: fine- to coarse-grained, dark gray, moist, well graded; fine to coarse angular gravel; 50% recovery (0/10/70/20)
		29.8			SP			SAND: fine-grained, dark gray, damp to dry, poorly graded; 60% recovery (5/10/85/0)
								Wood layer observed from 8' to 10'3" bgs
10		17.1			SW			SAND: fine- to coarse-grained, dark brown, wet, well graded; trace fine to coarse angular gravel; trace silt; 70% recovery
		12.0			SP			SAND: medium- to coarse-grained, dark gray, damp, poorly graded; trace wood debris; 100% recovery (0/0/100/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: C4





BORING LOG C6

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0.6					CL			Sandy CLAY: brown, dry, medium plasticity; fine- to coarse-grained poorly graded sand; trace subangular gravel; 100% recovery (60/0/35/5)
5					GW			GRAVEL with Sand: fine to coarse, dark gray, wet, angular to subrounded, well graded; fine- to coarse-grained well graded sand LNAPL observed from 6 to 9' bgs
22.3					GW			dark brown, angular to rounded; trace silt; 70% recovery (0/5/25/70)
10					CL			CLAY: dark brown, moist, medium to high plasticity; wood material; trace coarse well rounded gravel (95/0/0/5)
9.9					GW			GRAVEL with Sand: fine to coarse, brown, wet, angular to subrounded; fine- to coarse-grained sand; 90% recovery (0/0/15/85)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: C6

Asphalt

▽

Bentonite



BORING LOG C8

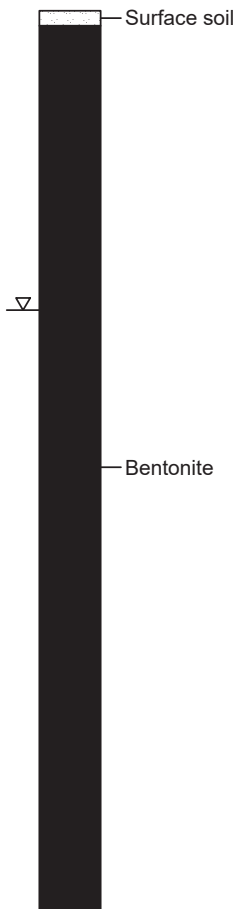
(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								Surface soil
1.1					ML			Sandy SILT: gray, dry to damp; fine-grained sand; trace fine subrounded gravel; 70% recovery (0/60/40/0)
2.8					CL			Gravelly CLAY: dark gray, wet, medium plasticity; coarse subangular to subrounded gravel; 70% recovery (60/0/0/40)
1.6					GW			GRAVEL with Sand: fine to coarse, olive brown, wet, angular; fine-to coarse-grained well graded sand; trace silt; 65% recovery (0/5/30/65) LNAPL observed from 9 to 10' bgs
136.1					SM			Silty SAND with Gravel: fine- to coarse-grained, dark brown, wet, well graded; fine angular gravel; 70% recovery (0/20/65/15)
47.1					GW			LNAPL observed at 12.5' bgs GRAVEL with Sand: fine to coarse, dark brown, wet, subangular to subrounded; fine- to coarse-grained well graded sand; trace silt; 75% recovery (0/5/15/80)
15								Backfill Materials: Surface completed to match surrounding soil 0.25 50-lb. bag of Bentonite Chips
20								

Boring: C8





BORING LOG D3

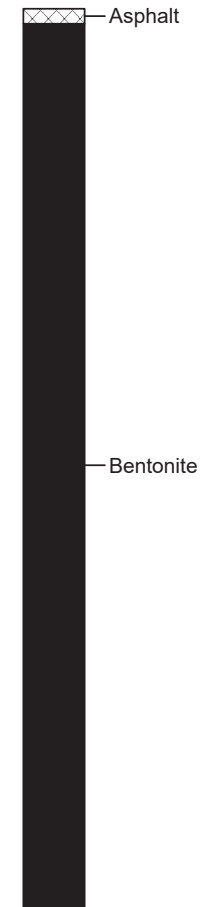
(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
59.8					SW			SAND with Gravel: fine- to coarse-grained, gray, damp; wood fibers; subrounded well graded gravel; 100% recovery (10/10/65/15)
91.6					CL			Sandy CLAY: brown, damp, plasticity; fine- to coarse-grained sand; 100% recovery (60/0/40/0)
17.2								SAND: fine- to coarse-grained, dark brown, damp; wood pieces; 100% recovery (0/5/95/0)
35.3					SW			gray, moist; 100% recovery (0/0/100/0)
8.0								medium- to coarse-grained; 100% recovery
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: D3



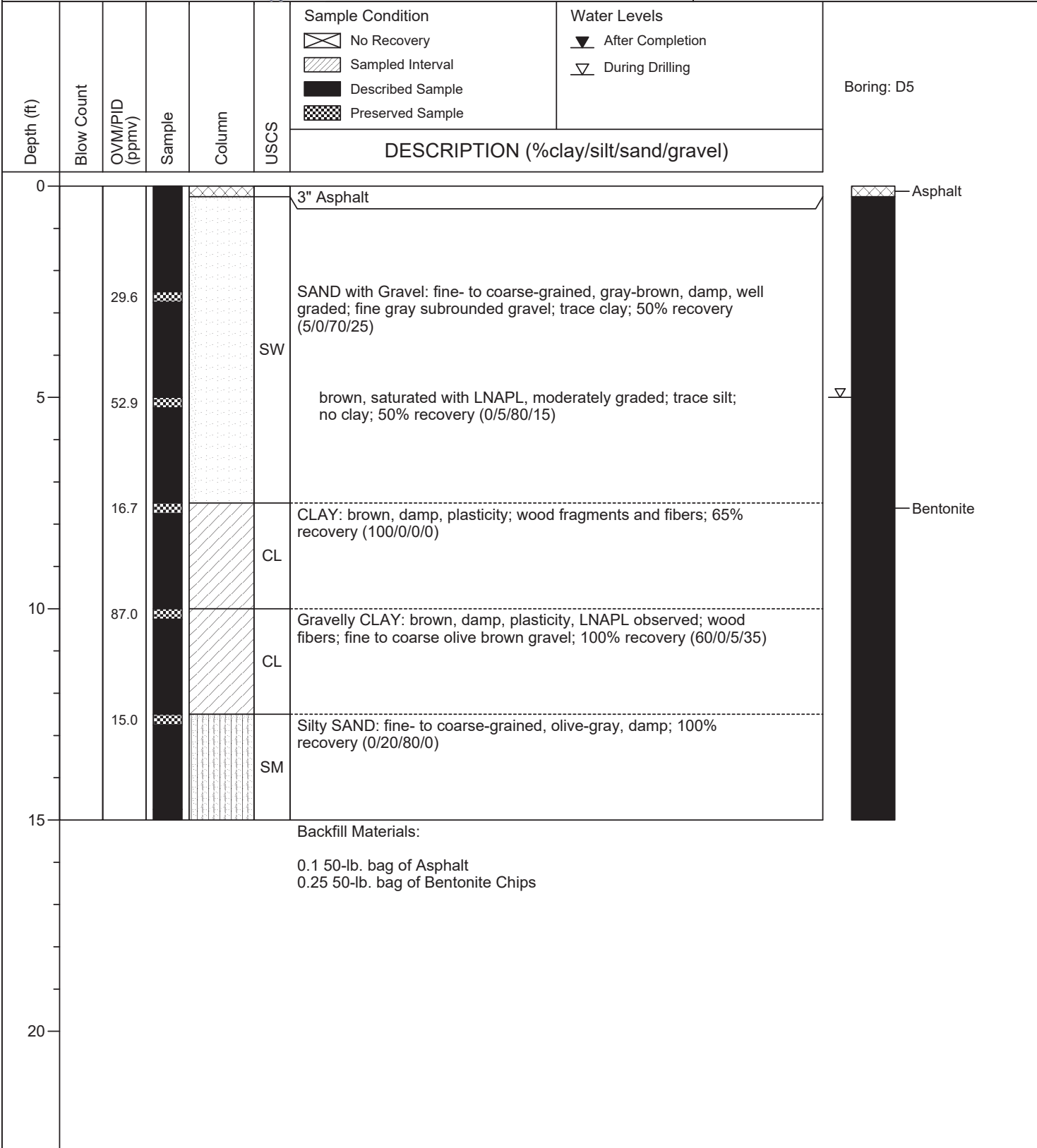


BORING LOG D5

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell



Boring: D5

Asphalt

▽

Bentonite

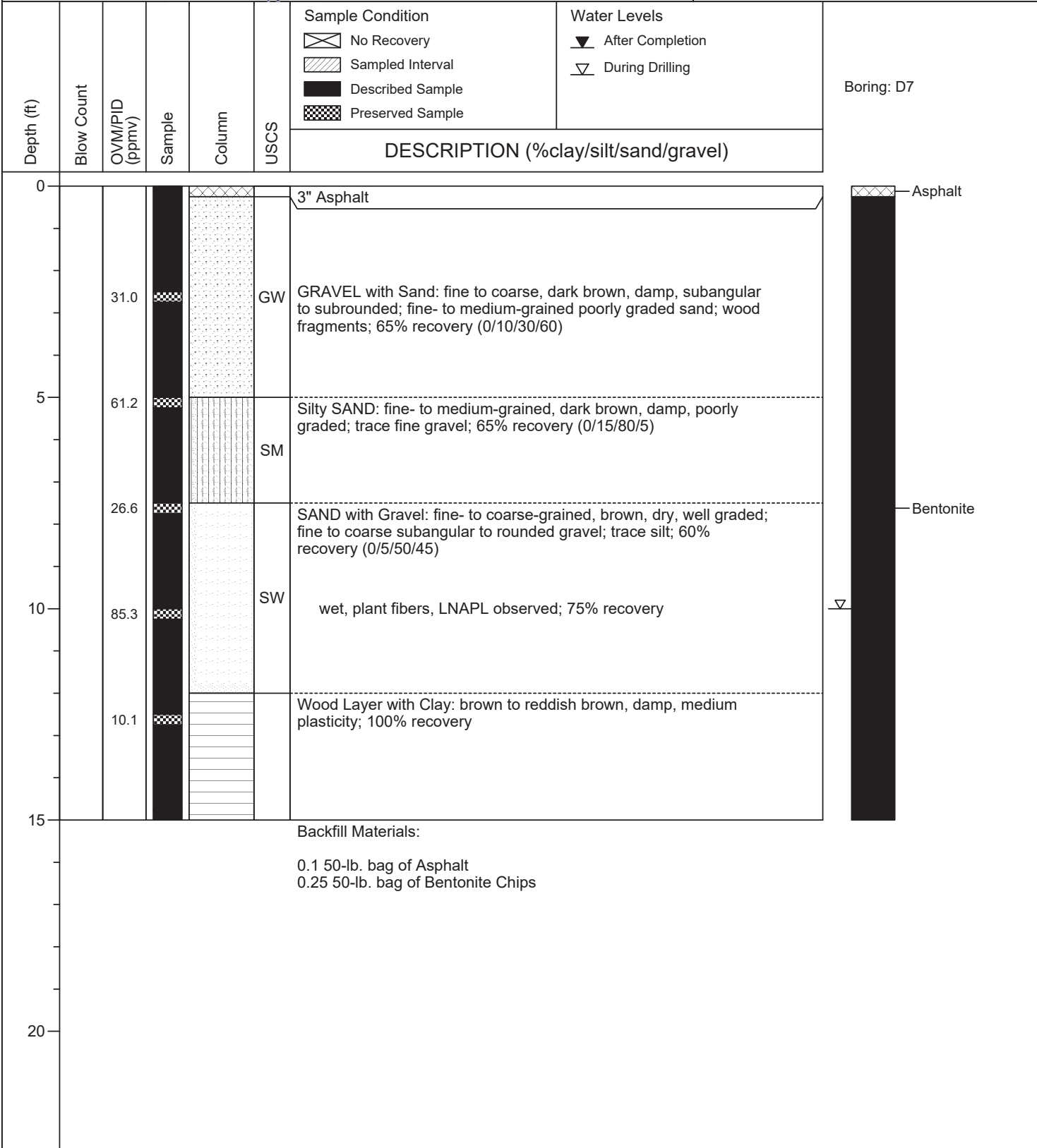


BORING LOG D7

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*



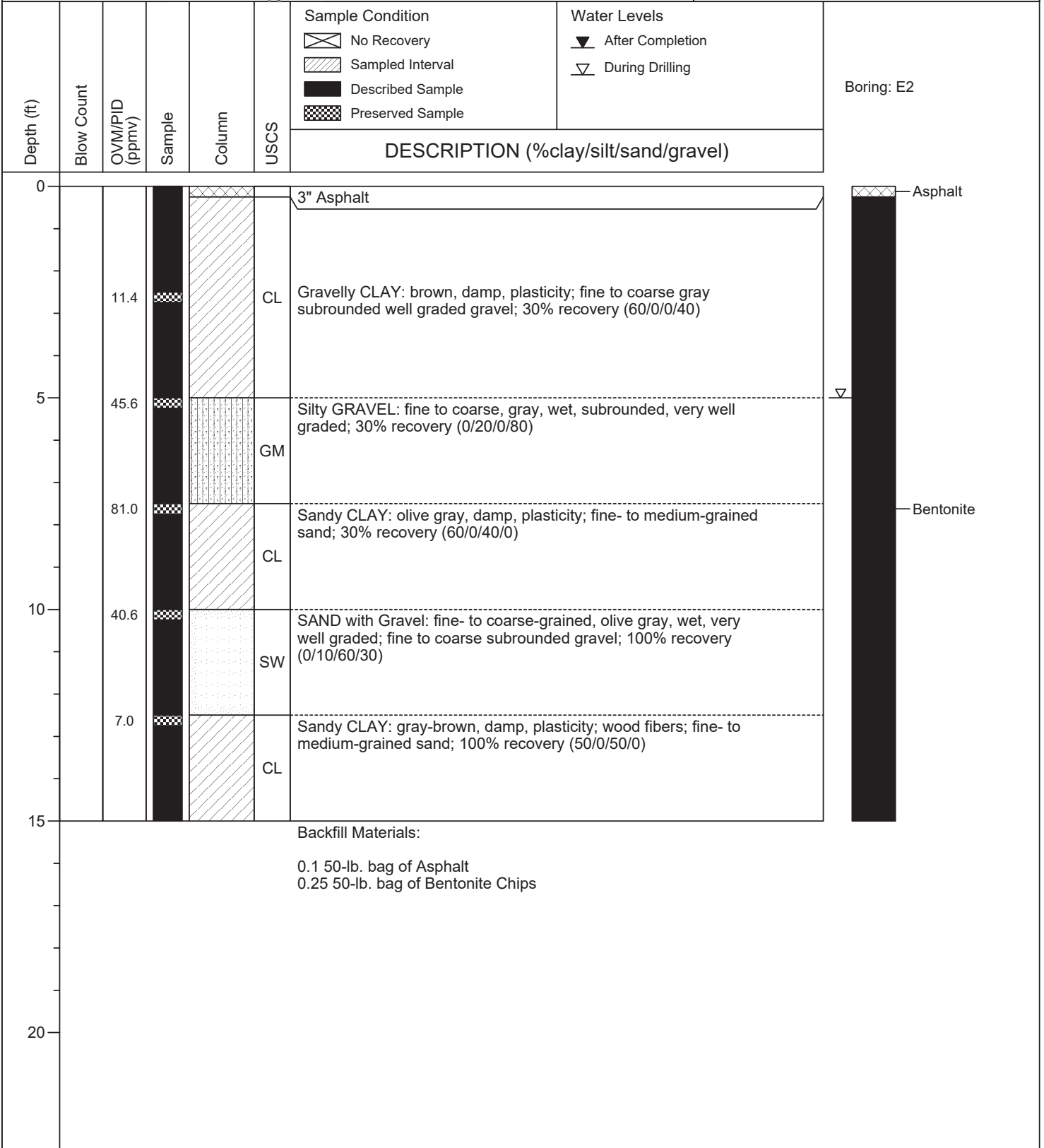


BORING LOG E2

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*





BORING LOG E4

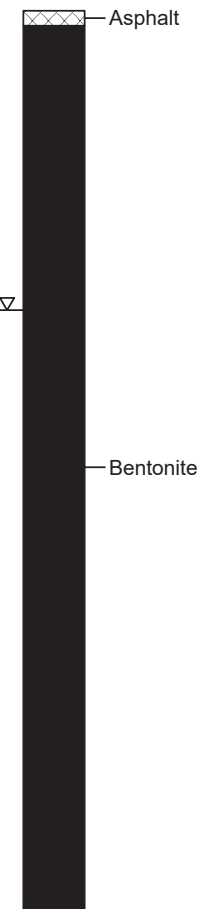
(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
25.7					GC			Clayey GRAVEL: fine to coarse, gray, damp, rounded to subrounded, very well graded; plasticity; 40%/0/10/50
17.0					GW		▽	GRAVEL with Sand: fine to coarse, olive brown, saturated, subangular to subrounded; fine- to coarse-grained olive brown well graded sand; 20% recovery (5/10/35/50)
19.0					CL			CLAY with Sand: brown and gray, damp, plasticity; wood fibers; fine-grained brown and gray very poorly graded sand; 70% recovery (80/0/20/0)
12.4					CL			CLAY: olive brown, moist, plasticity; fine subangular gravel; 100% recovery (90/0/0/10)
6.1					SW			SAND: fine- to coarse-grained, gray, damp, well graded; 80% recovery (0/0/100/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: E4



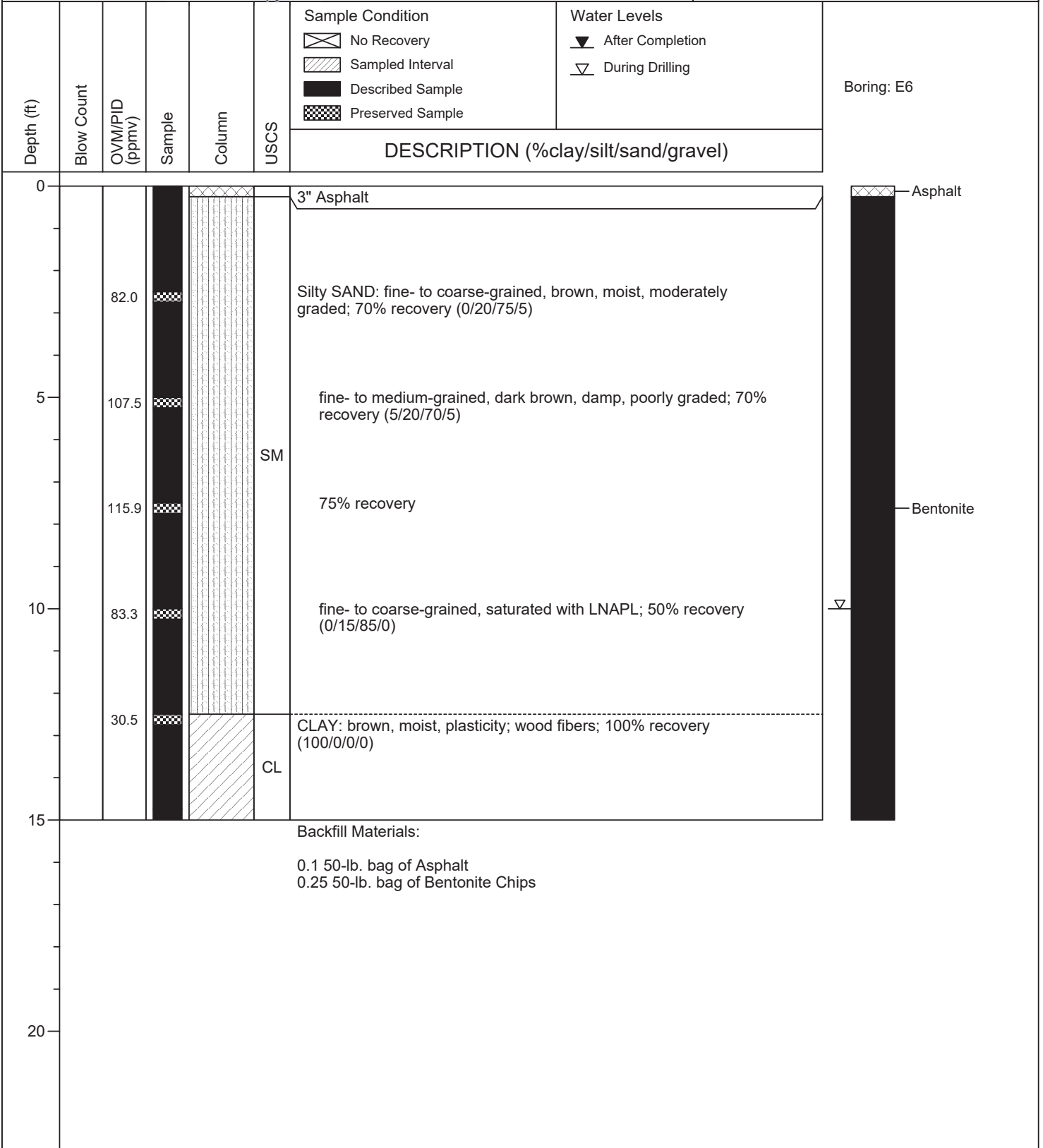


BORING LOG E6

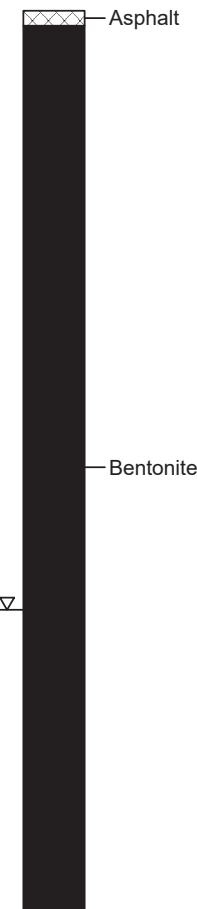
(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*



Boring: E6





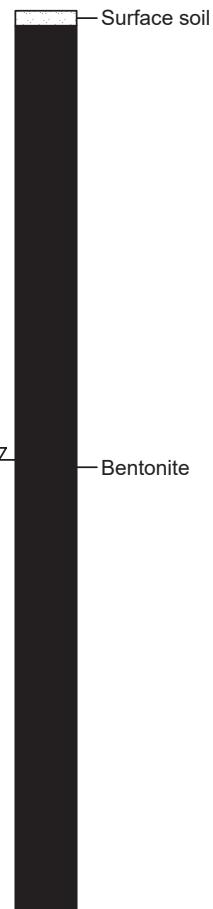
BORING LOG E8

(Page 1 of 1)

Date Drilled: : 08/09/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 7.5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : Paul Prevou
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
Boring: E8								
0								Surface soil
6.6			<input checked="" type="checkbox"/>		GW			GRAVEL with Sand: fine to coarse, light gray brown, dry, subangular to subrounded; fine- to coarse-grained well graded sand; trace silt; 70% recovery (0/5/35/60)
5			<input checked="" type="checkbox"/>		CL			CLAY: dark brown, moist, medium plasticity; plant fibers and wood; 85% recovery
253.4			<input checked="" type="checkbox"/>		CL			black and dark brown, wet, LNAPL observed; trace sand and gravel; 85% recovery (90/0/5/5)
10			<input checked="" type="checkbox"/>		GW			GRAVEL with Sand: fine to coarse, black, wet, angular, LNAPL observed; medium- to coarse-grained moderately graded sand; trace silt; 90% recovery (0/5/25/70)
233.2			<input checked="" type="checkbox"/>					Wood Layer: dark brown to dark red brown, moist, LNAPL observed; 95% recovery
15								Backfill Materials: Surface completed to match surrounding soil 0.25 50-lb. bag of Bentonite Chips
20								



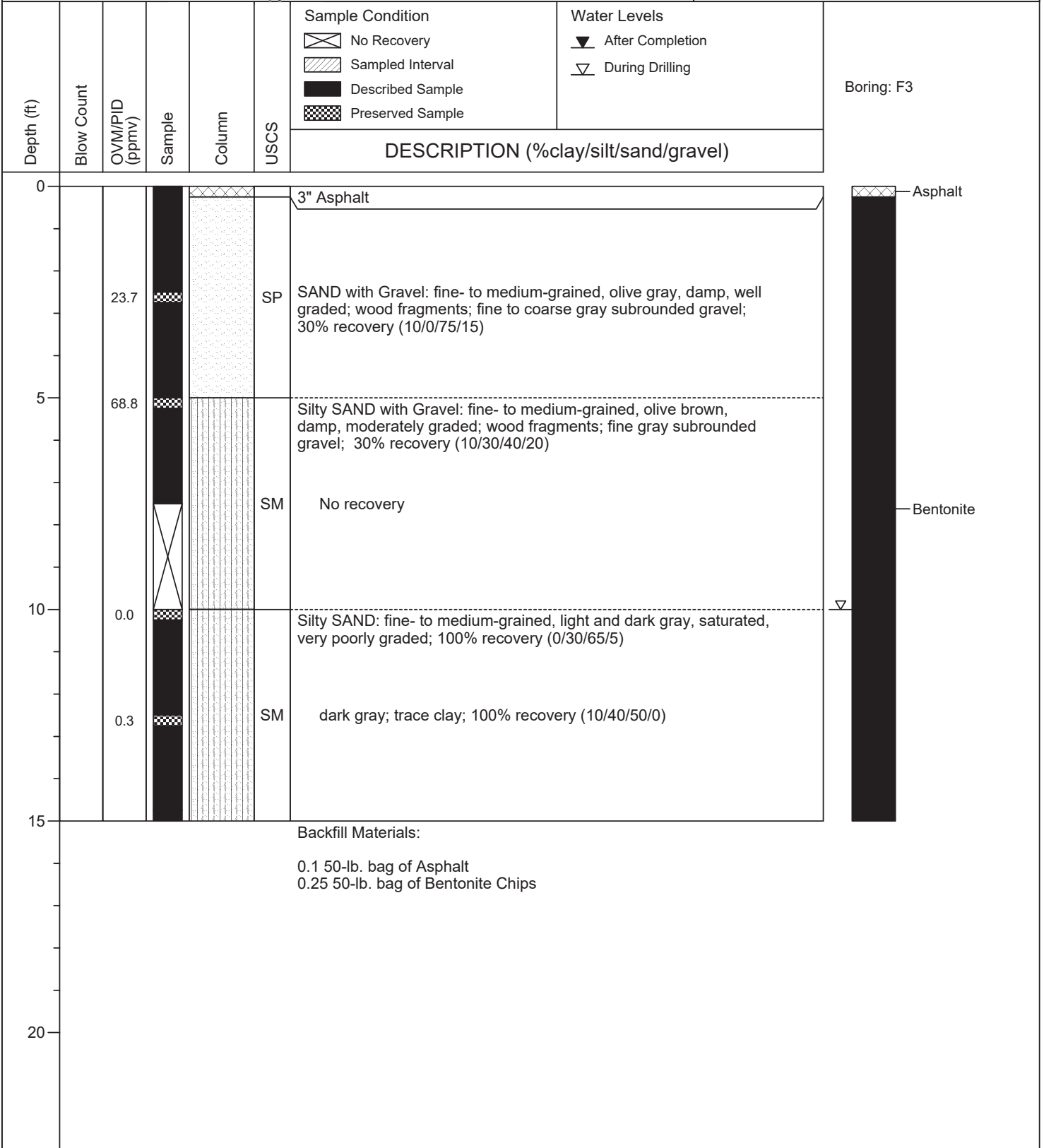


BORING LOG F3

(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*



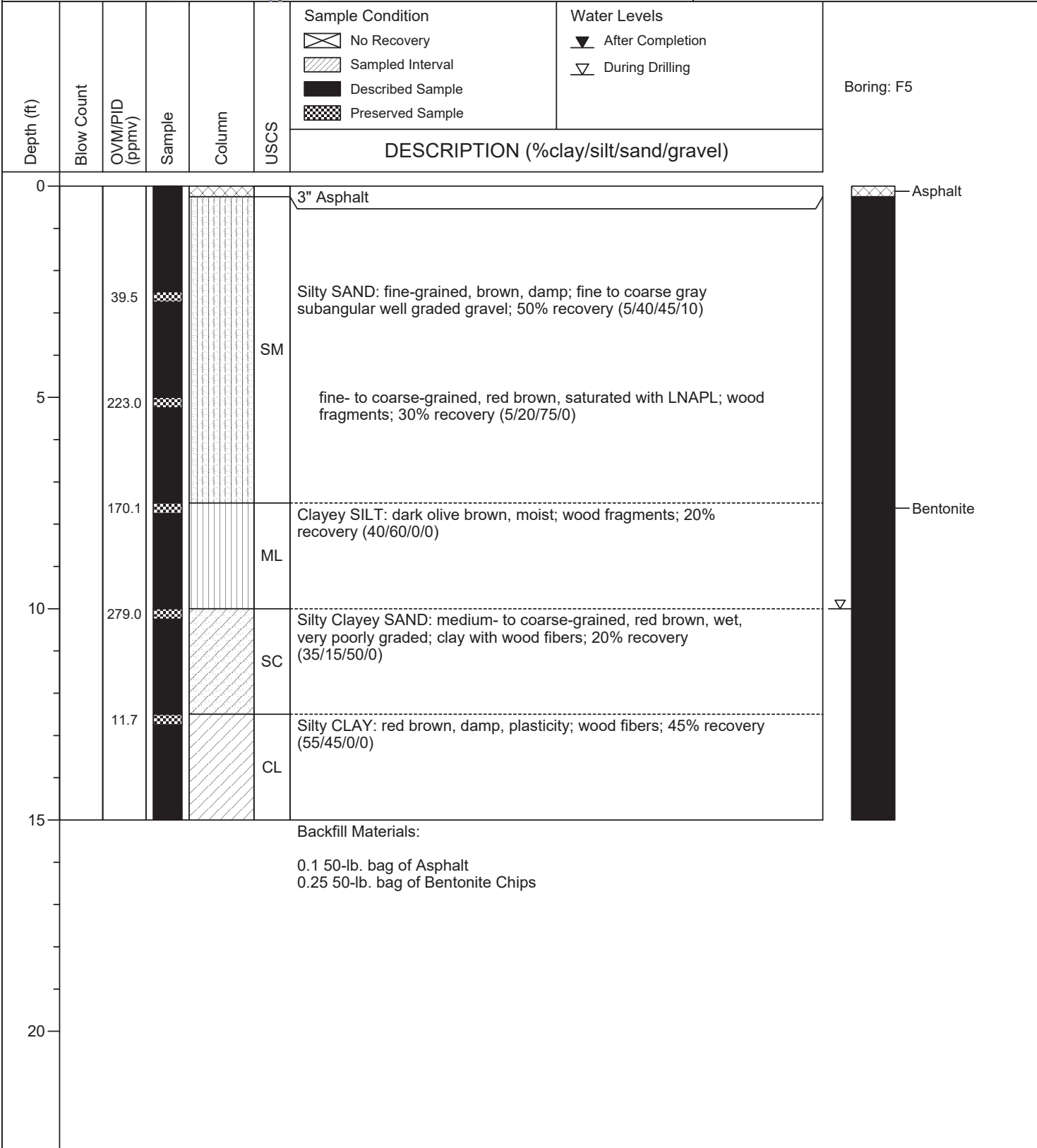


BORING LOG F5

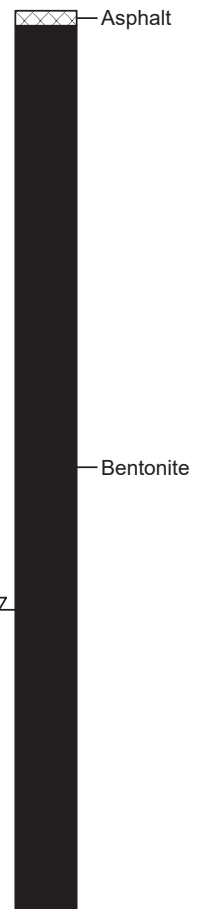
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*



Boring: F5





BORING LOG F7

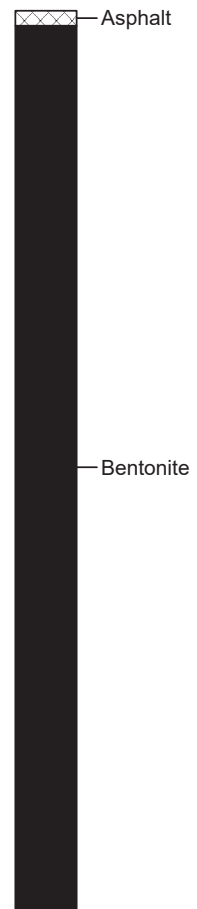
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
18.2								Silty SAND: fine- to medium-grained sand, dark brown, dry; fine to coarse dark gray subrounded gravel; wood fragments; 80% recovery (10/40/40/10)
5					SM			olive brown, damp; 80% recovery (10/40/45/5)
58.8								brown, moist; coarse brown subangular gravel; 80% recovery (10/40/48/2)
10								fine- to coarse-grained, red brown, very poorly graded; 100% recovery (5/45/50/0)
12.7					ML			Clayey SILT: red brown, damp; wood fibers; 100% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: F7





BORING LOG F9

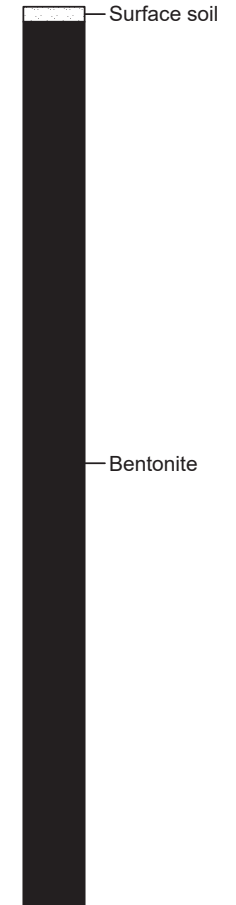
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								Surface soil
7.2			<input checked="" type="checkbox"/>		SM			Silty SAND: fine- to medium-grained, gray, dry, well graded; fine gray subrounded gravel; 50% recovery (5/30/60/5)
85.5			<input checked="" type="checkbox"/>					damp; 20% recovery
363.5			<input checked="" type="checkbox"/>		ML			Clayey SILT: dark and light gray, plasticity; wood fibers; 20% recovery (40/60/0/0)
155.2			<input checked="" type="checkbox"/>		SM			Silty SAND: fine- to medium-grained, red brown, damp, poorly graded; wood fragments; 100% recovery (10/40/50/0)
8.3			<input checked="" type="checkbox"/>		ML			Clayey SILT: red brown, damp, plasticity; wood fibers; 100% recovery (40/60/0/0)
15								Backfill Materials: Surface completed to match surrounding soil 0.25 50-lb. bag of Bentonite Chips
20								Bentonite

Boring: F9



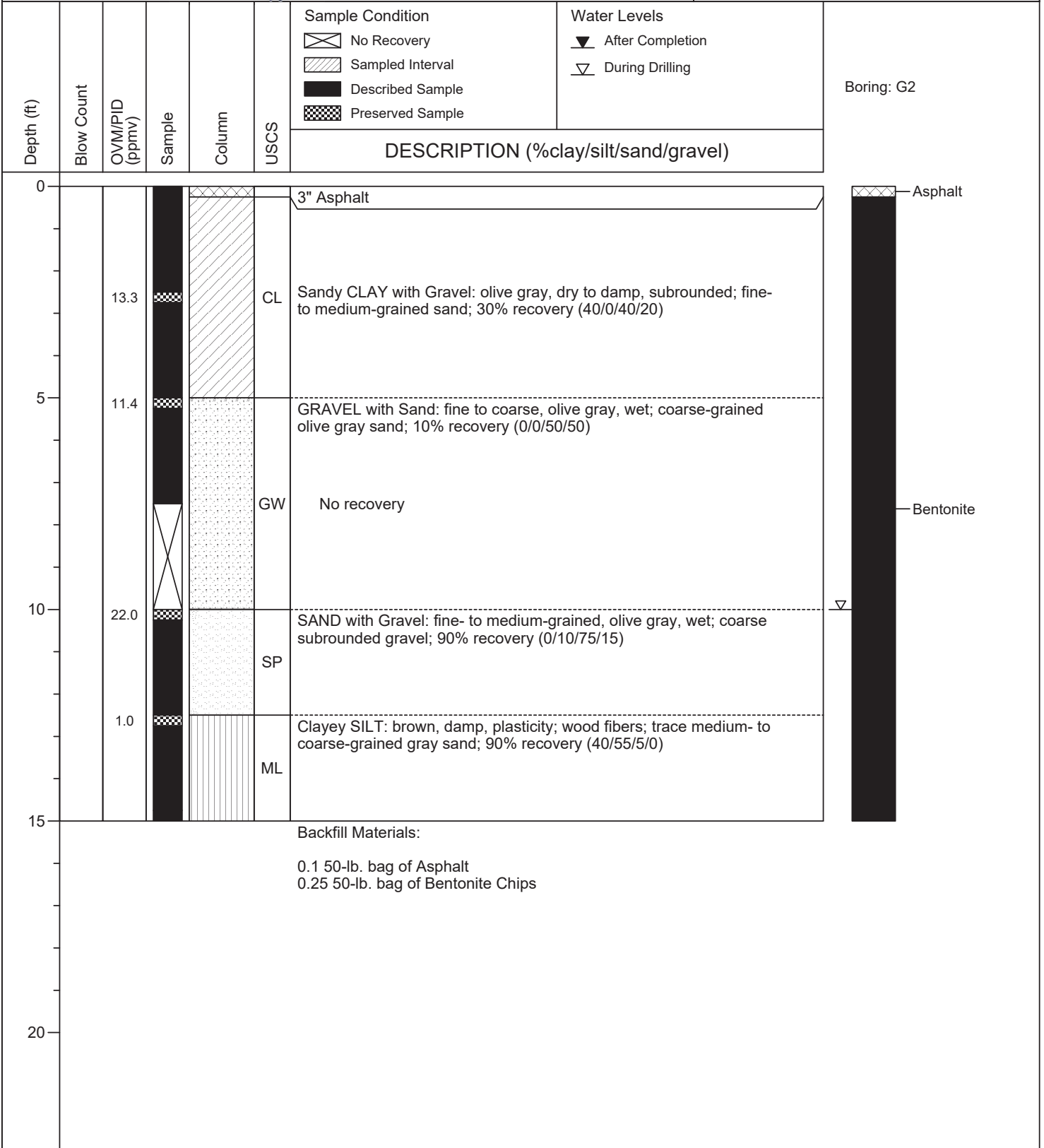


BORING LOG G2

(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*



Boring: G2

Asphalt

Bentonite



BORING LOG G4

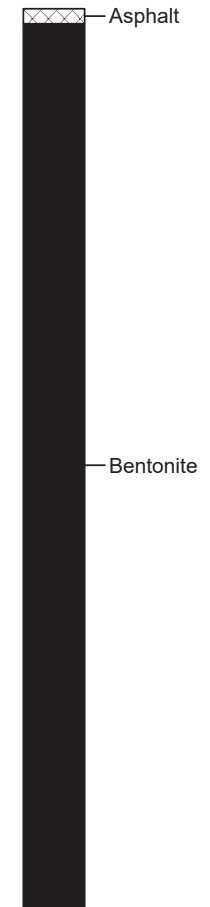
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
28.3								Silty SAND with Gravel: fine-grained, brown, damp; fine to coarse gray subrounded moderately graded gravel; 100% recovery (10/30/40/20)
24.0					SM			100% recovery (10/35/40/15)
1.5								subangular gravel; 20% recovery (10/30/45/15)
13.0					ML			Sandy SILT: gray, damp, plasticity; fine-grained poorly graded sand; 100% recovery (15/50/30/5)
1.4					ML			Clayey SILT: brown, plasticity; wood fibers; 100% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: G4





BORING LOG G6

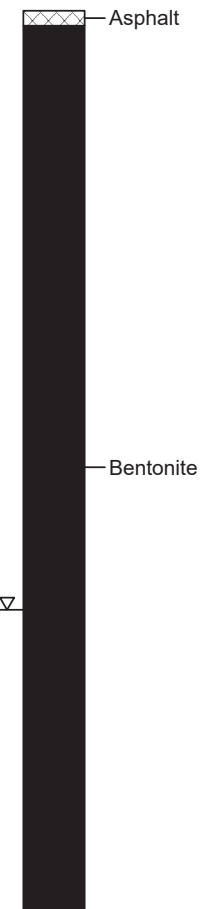
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
52.0								Silty SAND: fine- to medium-grained, gray, damp; fine to coarse gray subangular moderately graded gravel; 50% recovery (5/40/50/5)
47.5					SM			brown gray; fine subrounded gravel; 90% recovery (5/35/55/5)
106.2								light gray to brown; 75% recovery
84.5								fine- to coarse-grained, red brown, saturated with LNAPL; 10% recovery (0/40/60/0)
47.6					SM			Silty SAND with Gravel: fine-grained, olive gray, wet; fine to coarse olive gray well graded gravel; 20% recovery (5/35/45/15)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: G6





BORING LOG H3

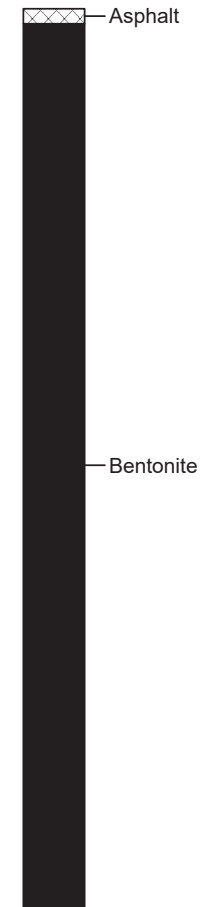
(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
16.5					SM			Silty SAND: fine-grained, dark brown, damp; fine gray subrounded poorly graded gravel; 100% recovery (10/40/45/5)
5								Concrete debris observed at 5' bgs
7.3					ML			SILT with Clay: gray, dry, plasticity; 100% recovery (20/70/10/0)
11.1					ML			SILT: gray, dry; 100% recovery (10/70/20/0)
10								
18.5					SM			Silty SAND: fine-grained, gray, dry, very poorly graded; 100% recovery (10/40/50/0)
15								
2.0					ML			Clayey SILT: brown, damp, plasticity, wood fibers; 35% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: H3





BORING LOG H5

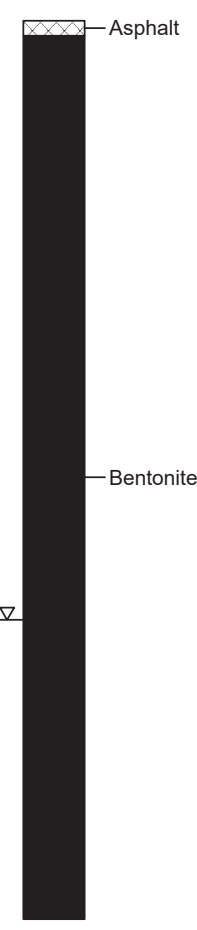
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
38.5								Silty SAND: fine-grained, dark brown, dry; fine to coarse gray subrounded well graded gravel; 100% recovery (5/35/50/10)
110.9					SM			fine- to medium-grained; 100% recovery
165.4								wood fragments; 85% recovery (5/45/50/0)
71.7					SM			Silty SAND with Gravel: fine- to coarse-grained, olive brown, saturated; fine olive brown subangular gravel; 40% recovery (0/30/50/20)
7.1					ML			Sandy SILT: gray and brown, damp; fine-grained sand; coarse gray rounded gravel; wood fragments; 90% recovery (10/50/35/5)
18.2					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 90% recovery (40/60/0/0)
								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips

Boring: H5





BORING LOG H7

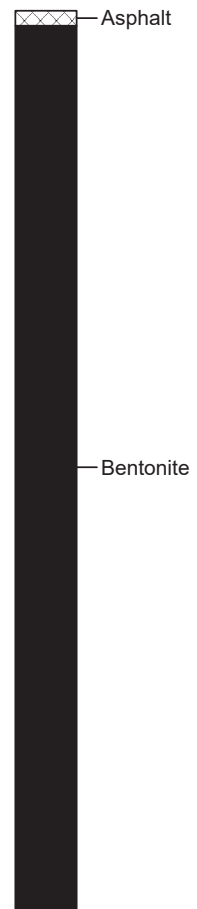
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
12.4					SM			Silty SAND with Gravel: fine- to medium-grained, olive brown, dry; fine subrounded gravel; wood fragments; 100% recovery (10/30/40/20)
70.0								dark gray, damp; fine to coarse gray gravel; 100% recovery (10/35/45/10)
37.3								Silty SAND: fine- to medium-grained, dark gray, damp; coarse gray subangular gravel; 100% recovery (10/40/45/5)
32.9					SM			no gravel; wood fragments; 80% recovery (10/40/50/0)
16.2								moist; 80% recovery
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: H7





BORING LOG I2

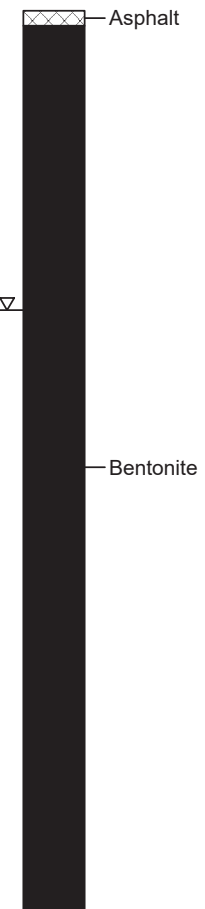
(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
23.3			<input checked="" type="checkbox"/>					Silty SAND: fine-grained, dark gray, dry; fine gray subrounded moderately graded gravel; 50% recovery (10/40/45/5)
38.9			<input checked="" type="checkbox"/>		SM		<input checked="" type="checkbox"/>	saturated; fine to coarse subrounded gravel; 15% recovery
19.7			<input checked="" type="checkbox"/>					fine- to medium-grained, dark brown, moist; 30% recovery (10/40/50/0)
21.6			<input checked="" type="checkbox"/>		ML			Clayey SILT: red brown, moist, plasticity; 30% recovery (40/60/0/0)
9.5			<input checked="" type="checkbox"/>		SM			Silty SAND: fine- to coarse-grained, dark gray, wet, wood fragments; fine to coarse gray subrounded gravel; 30% recovery (0/30/65/5)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: I2





BORING LOG I4

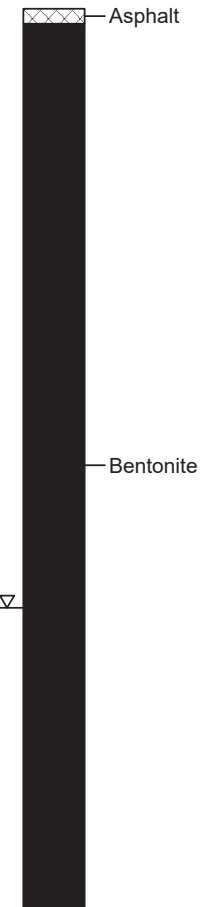
(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
22.5					SM			Silty SAND: fine-grained, dark gray, damp; fine to coarse subrounded well graded gravel; 70% recovery (10/35/45/10)
5					ML			SILT with Clay: gray and brown, dry, plasticity; 70% recovery (20/70/10/0)
10					ML			Clayey SILT: gray, dry, plasticity; 100% recovery (30/70/0/0) wet; 100% recovery red brown, damp, wood fibers; 100% recovery
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: I4





BORING LOG I6

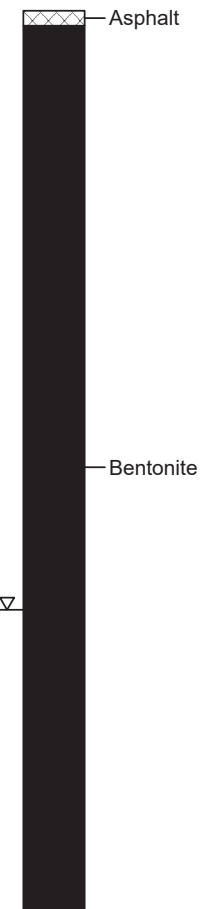
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
12.3								Silty SAND: fine- to medium-grained, gray, dry; fine gray subrounded gravel; 80% recovery (10/40/45/5)
125.1								dark brown; fine to coarse gray subangular gravel; wood fragments; 50% recovery (5/40/45/10)
23.4					SM			no wood fragments; 80% recovery
25.9								red brown, saturated; red brown gravel; 80% recovery (10/35/45/10)
5.2								dark gray; fine gray gravel; 80% recovery
14.2					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 60% recovery (40/60/0/0)
								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips

Boring: I6



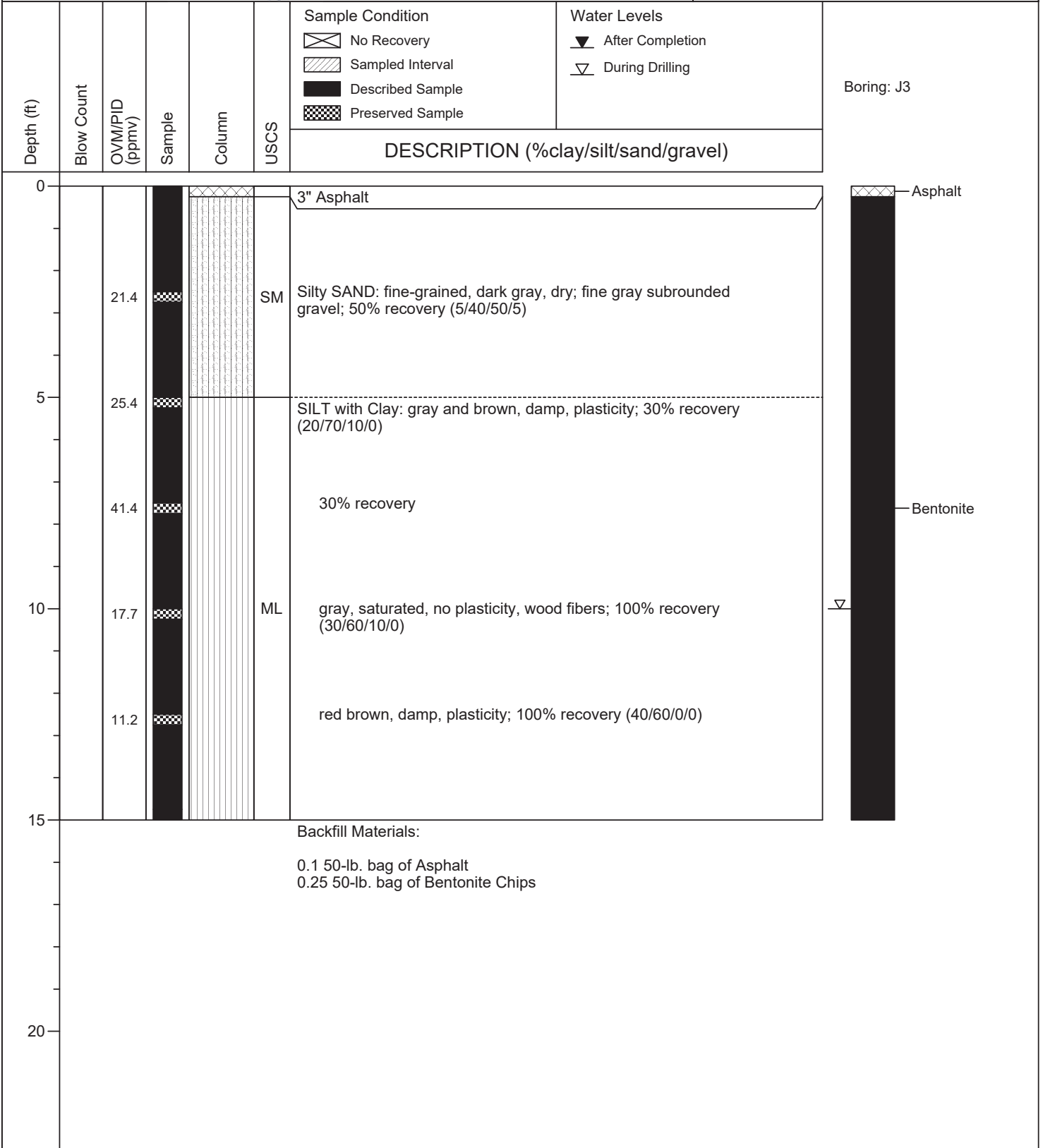


BORING LOG J3

(Page 1 of 1)

Date Drilled: : 08/11/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*





BORING LOG J5

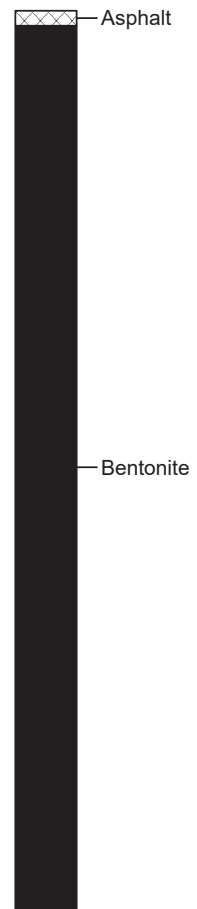
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
26.6					SM			Silty SAND: fine- to medium-grained, gray, dry; coarse light gray subangular very well graded gravel; 70% recovery (5/40/50/5)
233.2					SM			Silty SAND with Gravel: fine- to medium-grained, brown, dry; fine gray subrounded well graded gravel; 70% recovery (5/35/45/15)
28.3					SM			Silty SAND: medium-grained, gray, dry, wood fragments; 50% recovery (5/20/75/0)
36.5					SM			fine- to medium-grained, dark gray, damp; fine gray subrounded poorly graded gravel; 20% recovery (10/40/45/5)
5.1					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 10% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: J5





BORING LOG J7

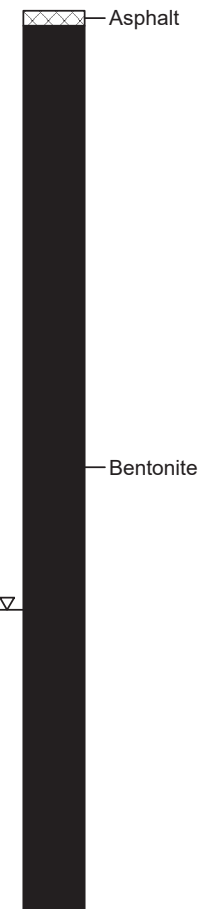
(Page 1 of 1)

Date Drilled: : 08/10/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
49.8					ML			Sandy SILT: dark gray, dry; fine- to medium-grained sand; fine gray rounded moderately graded gravel; 80% recovery (15/45/35/5)
17.6					SM			Silty SAND with Gravel: fine- to medium-grained, dark gray, dry; fine to coarse dark gray subrounded well graded gravel; 80% recovery (10/35/40/15)
163.2					SM			medium-grained, gray; subangular gravel; wood fragments; 40% recovery (5/30/45/20)
322.9					SM			Silty SAND: medium-grained, red brown, saturated with LNAPL; 15% recovery (5/20/75/0)
266.9					SM			fine- to coarse-grained, olive brown, moist; 15% recovery, (10/35/50/5)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips
20								

Boring: J7





BORING LOG K2

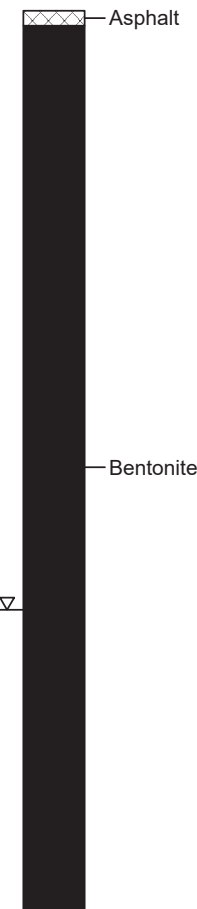
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 3					ML			Sandy SILT: gray, dry; 100% recovery (5/50/40/5)
3 - 5					ML			Clayey SILT: brown, damp, plasticity; 70% recovery (30/60/10/0) moist; 70% recovery (40/60/0/0)
5 - 10					ML			Sandy SILT: dark gray, saturated; medium-grained sand; 70% recovery (10/60/30/0)
10 - 15					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 70% recovery (30/60/10/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: K2





BORING LOG K4

(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 20' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4			Described Sample		ML			Clayey SILT: gray, dry, plasticity; 90% recovery (40/60/0/0)
4 - 8			Described Sample		ML			gray and brown, damp; 35% recovery
8 - 10			No Recovery					No recovery
10 - 15			Described Sample		ML			Sandy SILT: gray, saturated; 10% recovery (0/70/30/0)
15 - 20			Described Sample		ML			Clayey SILT: red brown with black coating, wet, wood fibers; 90% recovery (40/60/0/0)
20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: K4

Asphalt

Bentonite



BORING LOG K6

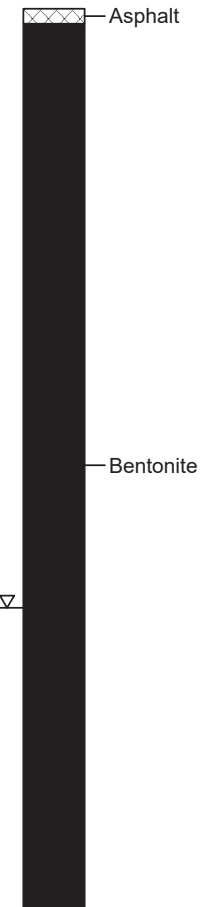
(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SM			Silty SAND with Gravel: fine- to medium-grained, gray, dry; fine to coarse gray subrounded gravel; wood fragments; 75% recovery (0/30/50/20)
5 - 8					ML			Sandy SILT: gray, moist; 100% recovery (10/60/30/0)
8 - 10					ML			Clayey SILT: gray, moist, plasticity; 100% recovery (40/60/0/0)
10 - 13					ML			Sandy SILT: gray, saturated; 40% recovery (5/65/30/0)
13 - 15					SP			SAND: medium-grained, gray, damp; 40% recovery (5/10/85/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: K6





BORING LOG L1

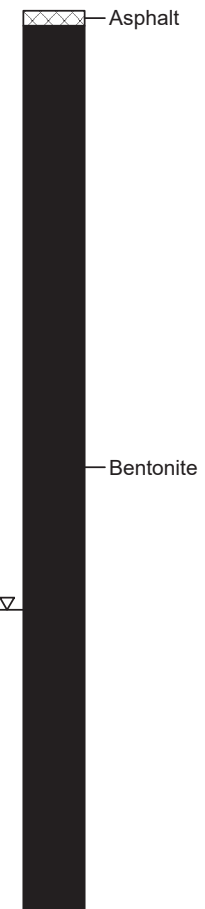
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5			Described Sample	Sampled Interval	ML			Sandy SILT: brown, wet; 25% recovery (10/60/30/0)
4.5 - 7.5			Described Sample	Sampled Interval	ML			gray, moist; 55% recovery
7.5 - 9.5			Described Sample	Sampled Interval	ML			Clayey SILT: brown, damp, wood fibers; 55% recovery (40/60/0/0)
9.5 - 12.5			Described Sample	Sampled Interval	SM			Silty SAND: fine- to medium-grained, olive gray, saturated; 100% recovery (10/40/50/0)
12.5 - 15			Described Sample	Sampled Interval	ML			Clayey SILT: brown, damp, wood fibers; 100% recovery (30/60/10/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: L1





BORING LOG L3

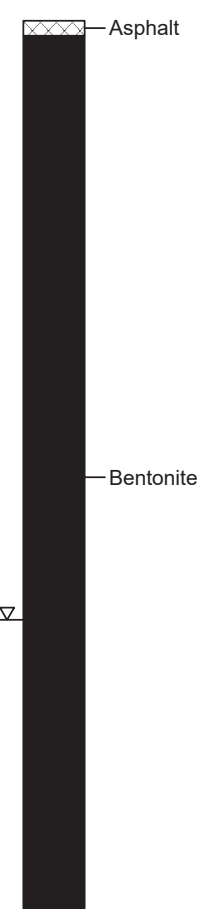
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					SM			Silty SAND: fine-grained, brown, dry; fine to coarse gray rounded well graded gravel; 100% recovery (5/40/50/5)
4.5 - 7.5					ML			Clayey SILT: gray and brown, damp, wood fragments; 70% recovery (40/60/0/0)
7.5 - 9.5					ML			Sandy SILT with Clay: brown, damp, plasticity; 70% recovery (20/50/30/0)
9.5 - 12.5					ML			Sandy SILT: gray, saturated; 95% recovery (5/60/35/0)
12.5 - 15					ML			Clayey SILT: brown, damp, wood fibers; 95% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: L3





BORING LOG L5

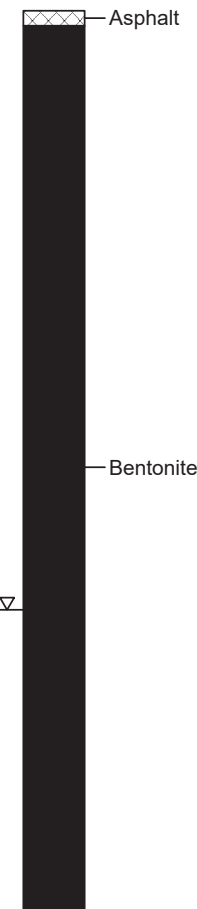
(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 3					ML			SILT with Sand: gray, dry, plasticity; 100% recovery (10/70/20/0)
3 - 5					ML			SILT: dark gray, damp, wood fragments throughout; 55% recovery (10/80/10/0)
5 - 10					ML			SILT with Sand and Clay: dark gray, damp, plasticity; fine- to medium-grained gray sand; 45% recovery (20/60/20/0) wet; 80% recovery (15/60/25/0)
10 - 15					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 80% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: L5





BORING LOG L7

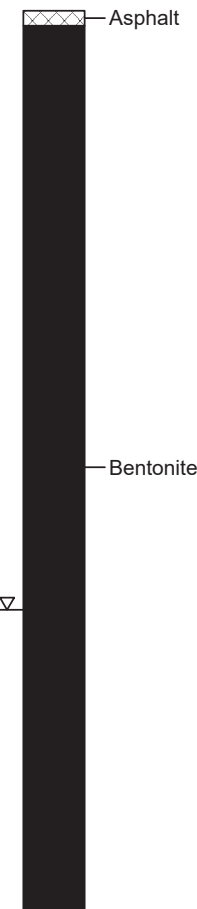
(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
~3					ML			Sandy SILT: dark gray, dry; fine gray angular gravel; 100% recovery (5/45/40/10)
~5					ML			Clayey SILT: gray, moist, plasticity; 60% recovery (45/55/0/0)
~8					ML			SILT: black, moist, large wood fragments; 50% recovery (20/80/0/0)
~10					SM			Silty SAND with Gravel: fine- to coarse-grained, black, wet; fine black angular gravel; wood fragments; 75% recovery (5/20/50/25)
~13					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 75% recovery
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: L7



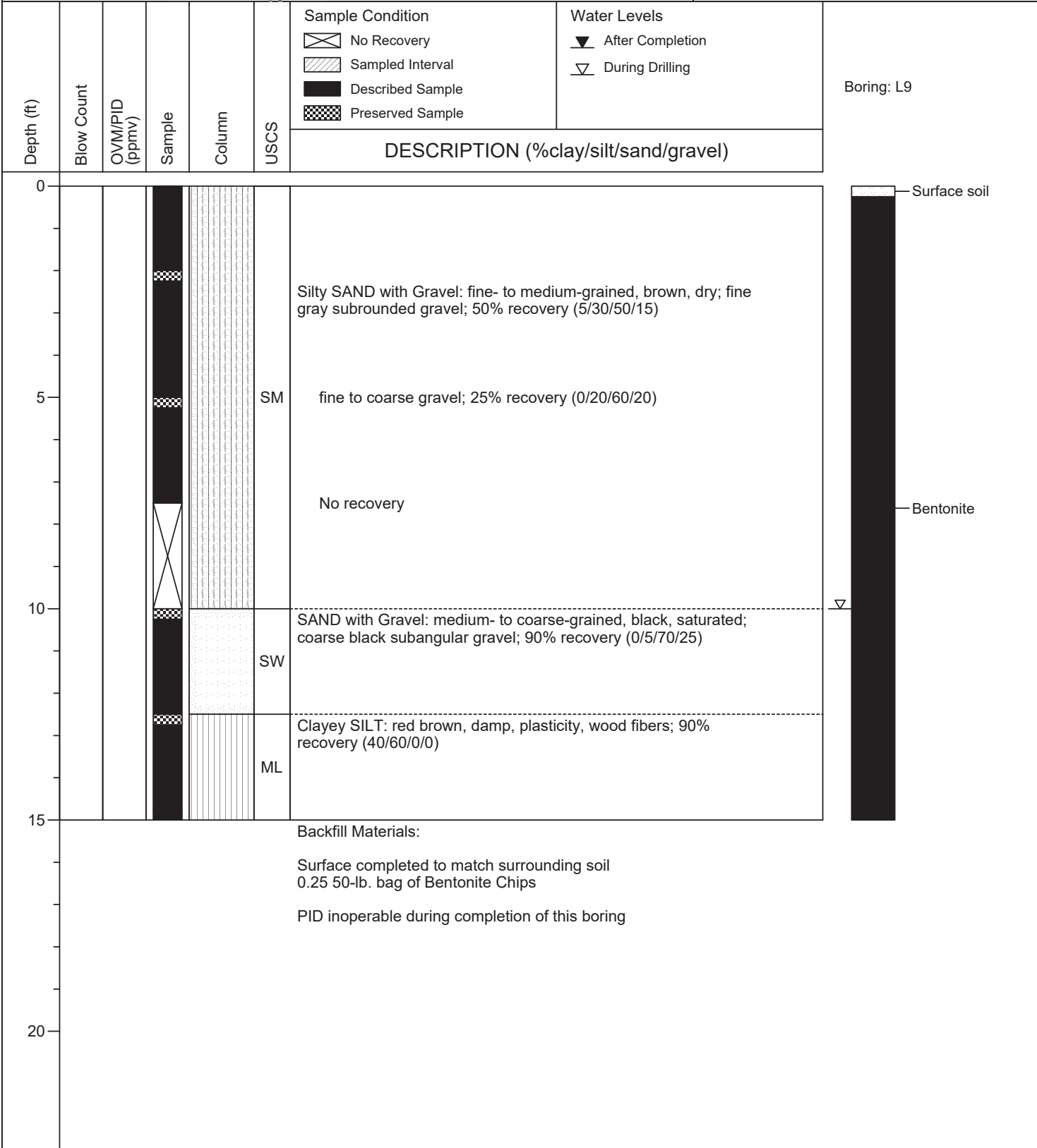


BORING LOG L9

(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell



Boring: L9

Surface soil

Bentonite

▽



BORING LOG M2

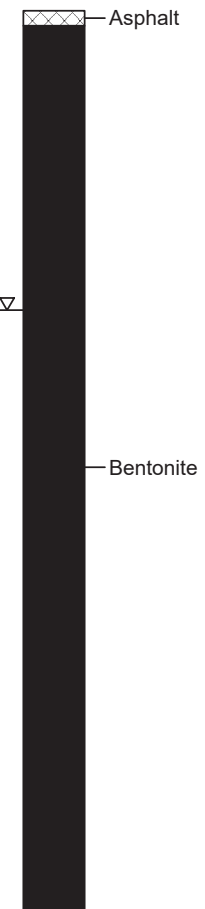
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					ML			Clayey SILT: gray, dry, plasticity; 50% recovery (40/60/0/0)
4.5 - 7.5					SM		▽	Silty SAND: medium- to coarse-grained, olive brown, saturated, moderately graded; 50% recovery (10/30/60/0)
7.5 - 10.5					ML			Clayey SILT: dark brown, moist, wood fragments; 50% recovery (35/65/0/0) brown, wood fibers; 65% recovery (30/60/10/0)
10.5 - 15					SM			Silty SAND: fine- to medium-grained, dark gray, damp; 65% recovery (5/20/75/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: M2





BORING LOG M4

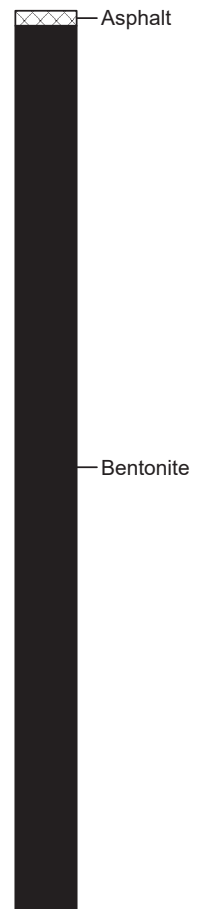
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5			Described Sample	Sampled Interval	ML			Sandy SILT with Gravel: brown, dry; fine gray subrounded gravel; 70% recovery (5/40/35/20)
4.5 - 7.5			Described Sample	Sampled Interval	SM			Silty SAND: fine- to medium-grained, gray and brown, dry; 40% recovery (10/40/50/0)
7.5 - 9.5			Described Sample	Sampled Interval	ML			SILT with Clay: red brown, damp, wood fragments; 40% recovery (20/80/0/0)
9.5 - 12.5			Described Sample	Sampled Interval	ML			Clayey SILT: brown, damp, plasticity; 100% recovery (30/60/10/0)
12.5 - 15			Described Sample	Sampled Interval	ML			100% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: M4





BORING LOG M6

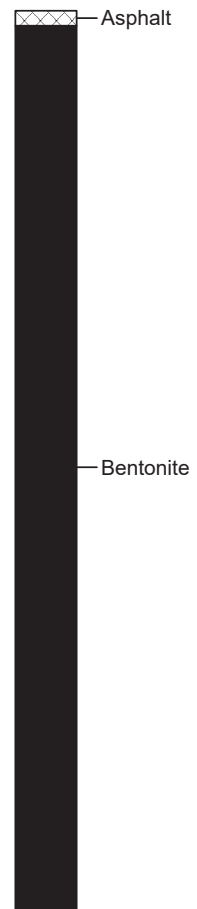
(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : Kerj Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					SM			Silty SAND: fine-grained, gray, dry; fine to coarse gray subrounded very well graded gravel; 100% recovery (5/40/45/10)
4.5 - 7.5					ML			SILT with Sand: dark brown, dry, wood fragments; 65% recovery (10/70/20/0)
7.5 - 9.5					ML			SILT with Clay: dark gray, moist, plasticity, wood fragments; 65% recovery (20/70/10/0)
9.5 - 12.5					ML			Sandy SILT: dark gray, damp; coarse-grained gray sand; 90% recovery (20/50/30/0)
12.5 - 15					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 90% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: M6





BORING LOG M8

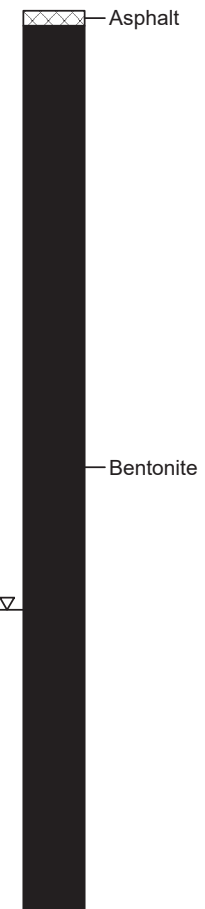
(Page 1 of 1)

Date Drilled: : 08/18/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
~2.5					ML			Sandy SILT with Clay: gray, damp, plasticity; 80% recovery (20/50/30/0)
~5					ML			Clayey SILT with Gravel: gray, moist, plasticity; fine gray subrounded gravel; 80% recovery (30/50/0/20)
~7.5								Wood fragments with a black coating; 80% recovery
10					SM		<input checked="" type="checkbox"/>	Silty SAND: fine- to coarse-grained, gray, saturated; fine to coarse gray subrounded gravel; wood fragments; 100% recovery (10/30/50/10)
~12.5					ML			Clayey SILT: red brown, damp, plasticity; 100% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: M8



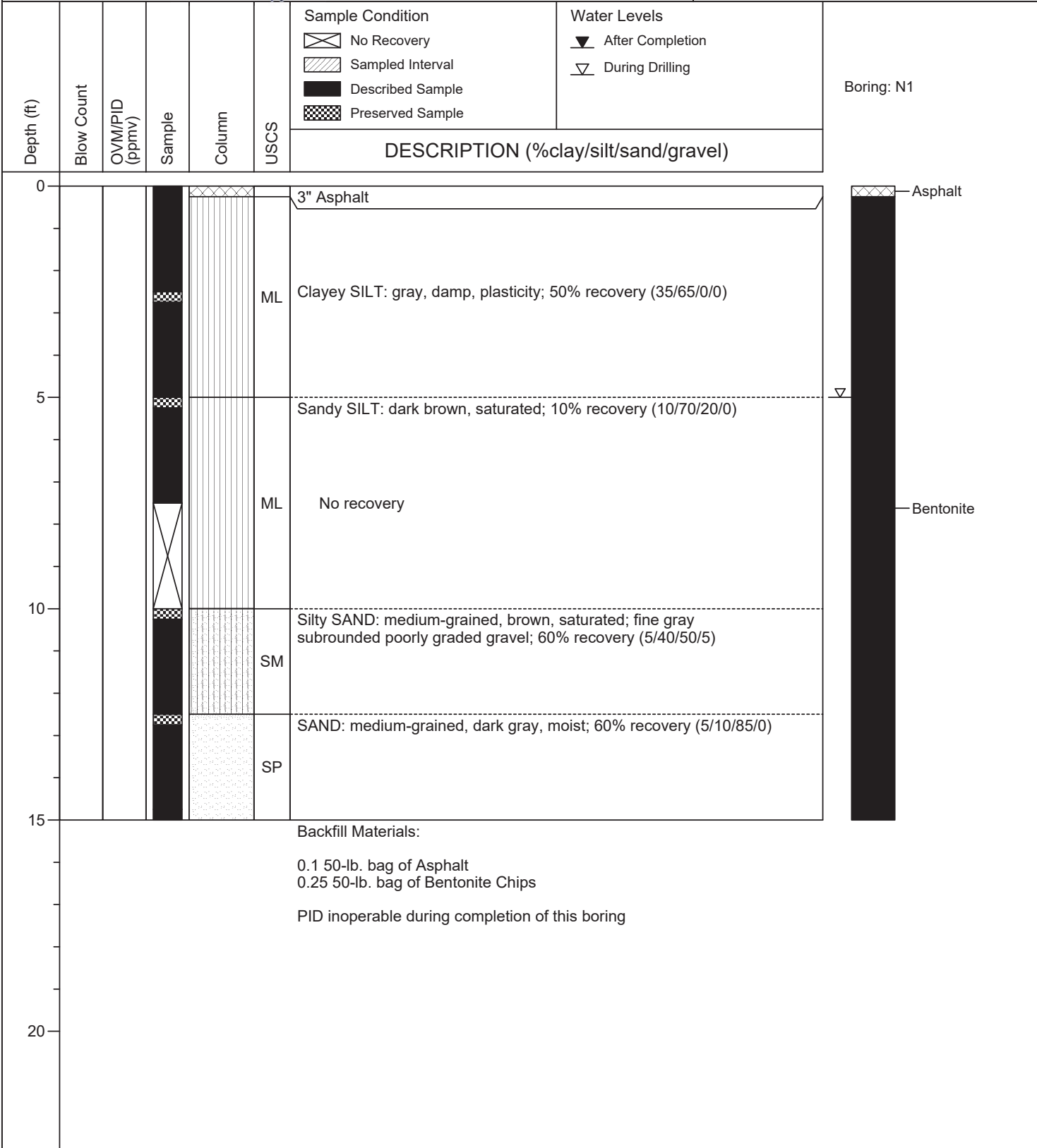


BORING LOG N1

(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*





BORING LOG N3

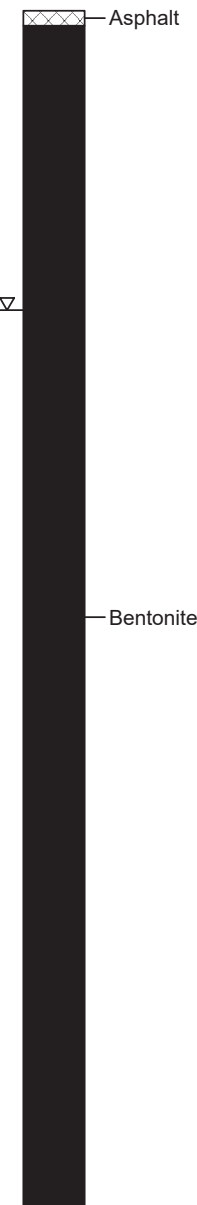
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 20' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4			Described Sample		ML			Sandy SILT: gray, dry; 50% recovery (10/60/30/0)
4 - 6			Described Sample		ML			saturated; 100% recovery (10/50/30/10)
6 - 10			Described Sample		ML			moist; 100% recovery (10/60/30/0)
10 - 14			No Recovery					No recovery
14 - 16			No Recovery					No recovery
16 - 20			Described Sample		ML			Clayey SILT: gray and brown, moist; 100% recovery (45/55/0/0)
Backfill Materials:								
0.1 50-lb. bag of Asphalt								
0.25 50-lb. bag of Bentonite Chips								
PID inoperable during completion of this boring								

Boring: N3





BORING LOG N5

(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	Boring: N5
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
DESCRIPTION (%clay/silt/sand/gravel)								
0						3" Asphalt		Asphalt
0 - 4.5					SM	Silty SAND: fine-grained, brown, dry, wood fragments; fine gray subangular moderately graded gravel; 80% recovery (5/35/50/10)		
4.5 - 7.5					ML	Sandy SILT: gray, wet; 70% recovery (10/60/30/0)	▽	
7.5 - 9.5					ML	Clayey SILT: gray and brown, damp, plasticity; 70% recovery (30/70/0/0)		Bentonite
9.5 - 12.5					ML	Sandy SILT with Clay: brown, moist, plasticity; 70% recovery (20/50/30/0)		
12.5 - 15					ML	Clayey SILT: red brown, damp, wood fibers; 70% recovery (40/60/0/0)		
15 - 20						Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring		



BORING LOG N7

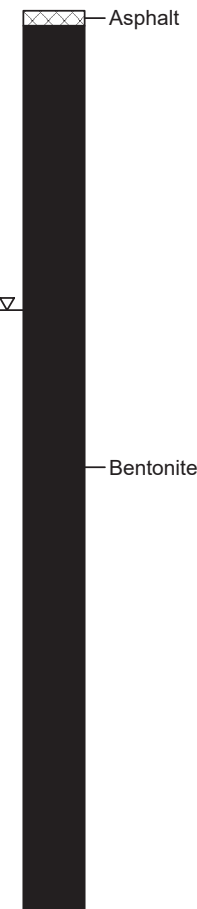
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					SM			Silty SAND: fine- to medium-grained, gray, dry; fine to coarse gray subrounded well graded gravel; 90% recovery (5/40/45/10)
4.5 - 7.5					ML		▽	Sandy SILT: dark gray, saturated; fine gray angular gravel; 50% recovery (5/50/40/5)
7.5 - 10.5					ML			Clayey SILT: brown, damp, wood fragments; 50% recovery (40/60/0/0)
10.5 - 15					ML			red brown, wood fibers; interspersed areas of Sandy SILT (dark gray, saturated); 90% recovery (30/60/10/0) 90% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: N7





BORING LOG O4

(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	Boring: O4
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
DESCRIPTION (%clay/silt/sand/gravel)								
0						3" Asphalt		Asphalt
0 - 5						No recovery		
5 - 10						No recovery		
10 - 12					SM	Silty SAND with Gravel: medium- to coarse-grained, dark brown, damp; fine gray subrounded gravel; 90% recovery (0/20/60/20)		
12 - 15					ML	Clayey SILT: red brown, damp, wood fibers; 90% recovery (40/60/0/0)		Bentonite
15 - 20						Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring		



BORING LOG O6

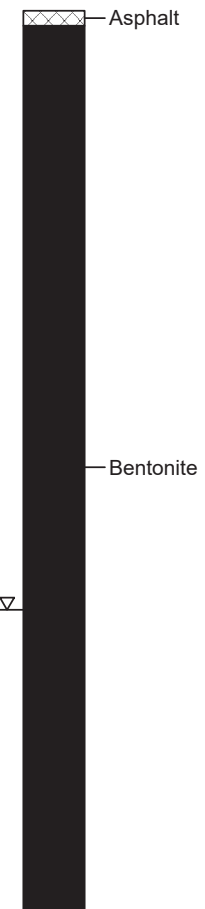
(Page 1 of 1)

Date Drilled: : 08/17/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					SM			Silty SAND: fine- to medium-grained, gray, dry; fine gray subrounded well graded gravel; 100% recovery (5/40/45/10)
4.5 - 7.5					ML			Clayey SILT: gray, damp, wood fragments; 100% recovery (45/55/0/0)
7.5 - 9.5					ML			Sandy SILT with Clay: gray, dry, plasticity; 100% recovery (20/50/30/0)
9.5 - 12.5					ML			Clayey SILT: brown, saturated, plasticity; 100% recovery (30/70/0/0)
12.5 - 15					SM			Silty SAND: fine-grained, dark gray, moist; 100% recovery (10/40/50/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: O6





BORING LOG O8

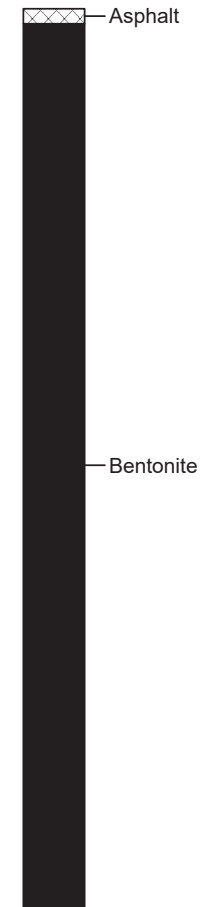
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SM			Silty SAND: fine-grained, gray, dry; 40% recovery (5/45/50/0)
5 - 10					ML			Sandy SILT: black, damp, wood fragments; 15% recovery (5/55/40/0) No recovery
10 - 13					ML			Clayey Sandy SILT: red black, damp, wood fibers; 60% recovery (30/40/30/0)
13 - 15					ML			Clayey SILT: red brown, damp, wood fibers; 60% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: O8





BORING LOG P1

(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SM			Silty SAND: fine- to medium-grained, gray, dry; fine to coarse gray subangular well graded gravel; wood fragments; 30% recovery (5/40/45/10)
5					ML		▽	Clayey SILT: brown, wet, plasticity; 90% recovery (40/60/0/0)
5 - 10					SM			Silty SAND: fine- to medium-grained, brown, damp, wood fragments; 90% recovery (10/45/45/0)
10					ML			Clayey SILT: brown, damp, plasticity, wood fibers; 100% recovery (40/60/0/0)
10 - 15					ML			red brown
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: P1

Asphalt

▽

Bentonite



BORING LOG P3

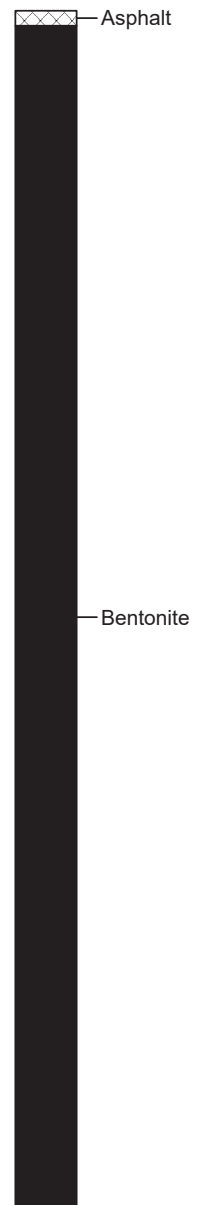
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 20' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Kerj Chappell, L.G. 2719
 Signature: : *Kerj Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 15					SM			Silty SAND: fine-grained, black, damp; fine gray subrounded gravel; wood; 50% recovery (5/40/50/5)
5						No recovery		
10						No recovery		
15					ML			Clayey SILT: red brown, dry, plasticity, wood fibers; 50% recovery (40/60/0/0)
20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: P3





BORING LOG P5

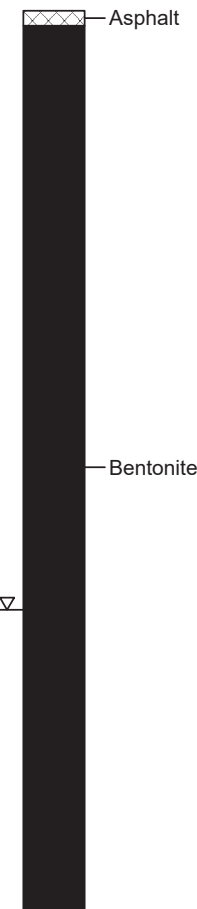
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SM			Silty SAND with Gravel: fine-grained, brown, dry; fine gray subrounded gravel; 40% recovery (5/35/45/15)
5 - 8					ML			Clayey SILT: brown, wet; 20% recovery (30/70/0/0)
8 - 10					SM			Silty SAND: fine- to medium-grained sand, brown, dry; 20% recovery (10/45/45/0)
10 - 13					SM			Silty SAND with Gravel: fine- to medium-grained, olive brown, saturated; fine to coarse gray subrounded gravel; 100% recovery (0/30/50/20)
13 - 15					ML			Clayey SILT: brown, damp, plasticity; 100% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: P5





BORING LOG Q2

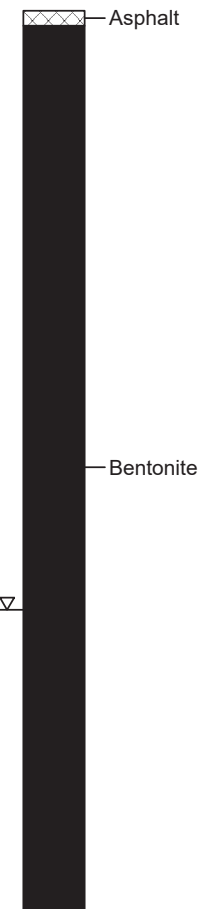
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
~3.5			<input checked="" type="checkbox"/>		ML			Clayey SILT: gray and brown, dry, plasticity; 50% recovery (30/70/0/0)
~5.5			<input checked="" type="checkbox"/>		ML			SILT: brown, moist, plasticity; 20% recovery (25/70/5/0)
~8.5			<input checked="" type="checkbox"/>		ML			Clayey SILT: brown, moist, plasticity; 20% recovery (30/70/0/0)
10			<input checked="" type="checkbox"/>		ML		<input type="checkbox"/>	Sandy SILT: gray, wet; 20% recovery (10/50/40/0)
~13.5			<input checked="" type="checkbox"/>		ML			Clayey SILT: gray, wet, plasticity; 20% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: Q2





BORING LOG Q6

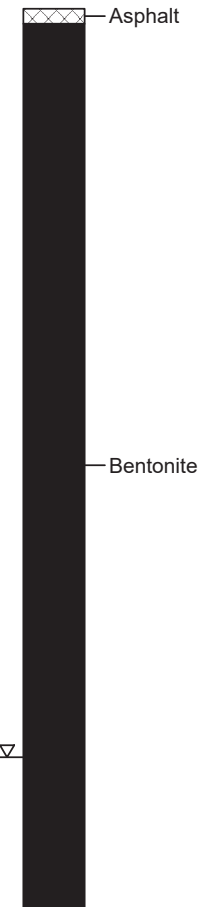
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 12.5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : *Keri Chappell*

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5			Described Sample		SM			Silty SAND with Gravel: fine-grained, black, dry; fine gray subrounded gravel; wood fragments; 100% recovery (0/40/45/15)
4.5 - 9.5			Described Sample		SM			Silty SAND: fine- to medium-grained, gray, dry; 100% recovery (10/30/60/0) fine-grained, moist; 100% recovery (10/40/50/0)
9.5 - 12.5			Described Sample		ML			Clayey SILT: gray and brown, moist (40/60/0/0)
12.5 - 15			Described Sample		SM		▽	Silty SAND: fine-grained, gray, wet (5/40/55/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: Q6





BORING LOG R1

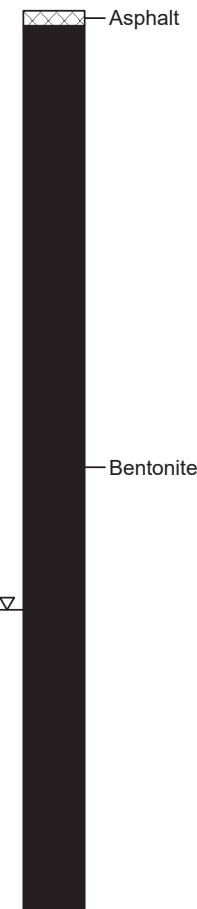
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 5					SM			Silty SAND: fine- to medium-grained, dark gray, dry; 30% recovery (10/40/50/0)
5 - 8					ML			Sandy SILT: gray, dry; fine-grained sand; 30% recovery (10/60/30/0)
8 - 10					SM			Silty SAND: medium-grained, dark gray, dry; 15% recovery (10/30/60/0) fine- to medium-grained, gray, moist; 50% recovery (10/40/50/0)
10 - 15					ML			Clayey SILT: red brown, wood fibers; 75% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: R1





BORING LOG R3

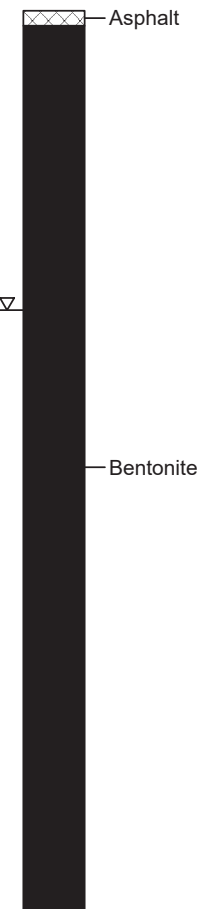
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 5' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 12					SM			Silty SAND: fine-grained, brown, damp; fine gray subrounded gravel; 75% recovery (5/40/50/5) gray, wet; no gravel; 60% recovery (5/45/50/0) 75% recovery fine- to medium-grained, moist; 90% recovery (5/40/55/0)
12 - 15					ML			Clayey SILT: red brown, dry, plasticity, wood fibers; 95% recovery (40/60/0/0)
15								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: R3





BORING LOG R5

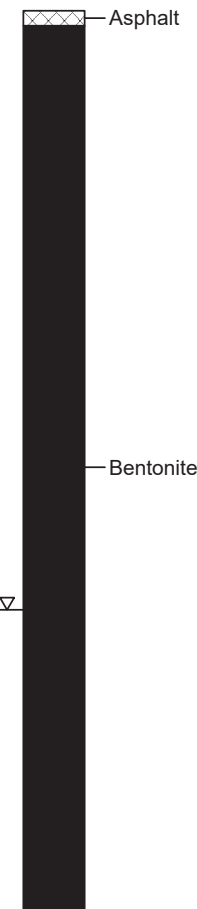
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : 10' bgs

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 15					SM			Silty SAND: fine-grained, brown, dry; coarse gray subrounded gravel; 50% recovery (5/30/55/10) LNAPL observed in liner, no recovery from 5' to 8' bgs fine- to medium-grained, gray, saturated; 80% recovery (0/40/60/0)
15					ML			Sandy SILT with Clay: red brown, dry, wood fibers; fine-grained gray sand; 75% recovery (20/50/30/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring
20								

Boring: R5





BORING LOG S4

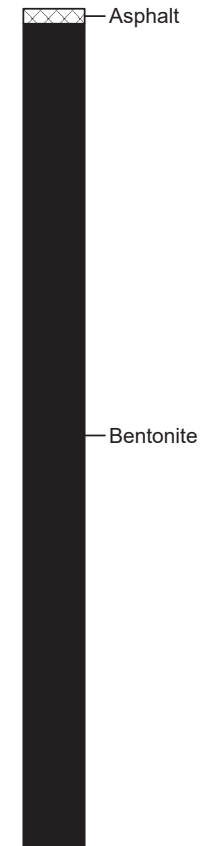
(Page 1 of 1)

Date Drilled: : 08/12/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 14' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 4.5					ML			Clayey SILT: brown, damp, plasticity; 60% recovery (40/60/0/0)
4.5 - 7.5								gray, moist; 100% recovery (30/60/10/0)
7.5 - 12.5					SM			Silty SAND: fine-grained, gray, moist; 100% recovery (20/30/50/0)
12.5 - 14					ML			Clayey SILT: red brown, dry, wood fibers; 100% recovery (40/60/0/0)
14 - 15								Refusal at 14' bgs
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: S4





BORING LOG T1

(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	Boring: T1
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
DESCRIPTION (%clay/silt/sand/gravel)								
0						3" Asphalt		Asphalt
						Clayey SILT: brown, dry, plasticity; 30% recovery (40/60/0/0)		
5						gray, moist; 40% recovery (30/70/0/0)		
					ML	40% recovery		Bentonite
10						gray and brown, no plasticity, wood fibers; 65% recovery		
						red brown, damp; 65% recovery (40/60/0/0)		
15						Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring		
20								



BORING LOG T3

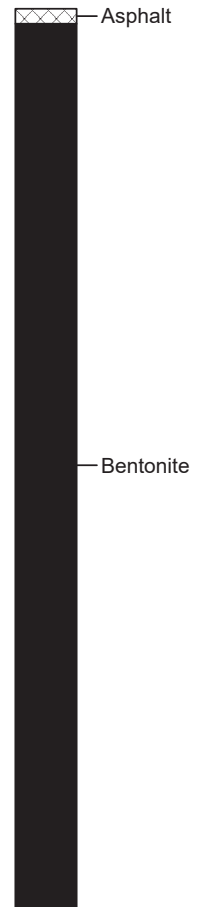
(Page 1 of 1)

Date Drilled: : 08/16/21
 Drilling Co.: : Holocene Drilling, Inc.
 Drilling Method: : Push Probe
 Sampling Method: : M5 liners
 Borehole Diameter: : 2.5"
 Casing Diameter: : N/A
 Latitude : N/A
 Longitude : N/A
 Total Depth: : 15' bgs
 First GW Depth: : N/A

Project No.: : 031447
 Site: : ExxonMobil ADC, 2717/2731 Federal Avenue, Everett, WA
 Logged By: : John Considine
 Reviewed By: : Keri Chappell, L.G. 2719
 Signature: : Keri Chappell

Depth (ft)	Blow Count	OVM/PID (ppmv)	Sample	Column	USCS	Sample Condition	Water Levels	DESCRIPTION (%clay/silt/sand/gravel)
						<input type="checkbox"/> No Recovery <input type="checkbox"/> Sampled Interval <input type="checkbox"/> Described Sample <input type="checkbox"/> Preserved Sample	<input type="checkbox"/> After Completion <input type="checkbox"/> During Drilling	
0								3" Asphalt
0 - 10					ML			Clayey SILT: gray and brown, damp, plasticity; 70% recovery (30/70/0/0) moist; 75% recovery gray, dry; 75% recovery
10 - 12					SM			Silty SAND: fine- to medium-grained, dark gray, damp; 40% recovery (5/40/55/0)
12 - 15					ML			Clayey SILT: red brown, damp, plasticity, wood fibers; 65% recovery (40/60/0/0)
15 - 20								Backfill Materials: 0.1 50-lb. bag of Asphalt 0.25 50-lb. bag of Bentonite Chips PID inoperable during completion of this boring

Boring: T3



APPENDIX D

Field Protocol



Excavation Field Protocol

Preliminary Activities

Prior to the onset of field activities at the site, Stantec or a licensed subcontractor obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Stantec or the general contractor marks the area to be excavated and contacts the local one call utility locating service at least 48 hours prior to the start of work to mark buried utilities. The excavation location may also be checked for buried utilities by a private geophysical surveyor. Prior to excavation, the area is cleared in accordance with the client's procedures. Fieldwork is conducted under the advisement of a registered professional geologist or civil engineer and in accordance with an updated site-specific safety plan prepared for the project, which is available at the site during field activities.

Excavation and Soil Sampling Procedures

The excavation is performed by a licensed general contractor. Air monitoring is conducted as required by the regulatory agency or client, and the readings are recorded on a log. Excavated soil is temporarily stockpiled, covered with an impervious material (e.g., plastic sheeting), secured and labeled, or immediately containerized into bins.

Upon reaching the planned limit of the excavation, soil samples are collected from the bottom and sidewalls of the excavation, as directed by the regulatory agency or as specified in the work plan. Soil samples are collected using the bucket of the excavating equipment (e.g., backhoe or excavator), and then the sample container (sleeve or glass jar) is pushed by hand into the soil near the teeth of the equipment bucket to ensure that soil from the limit of the excavation, not slough, is collected. Alternatively, a metal sleeve may be driven by slide hammer into the soil. Samples from the stockpile(s) are collected in the same manner.

Soil samples are preserved in the metal or plastic sleeve, in glass jars or other manner required by the local regulatory agency (e.g., Environmental Protection Agency Method 5035). Each sleeve is promptly sealed with Teflon™ tape, capped, labeled, and placed in a cooler chilled to 4° Celsius. The samples are transferred under chain-of-custody protocol to a client-approved, state-certified laboratory for analysis.

Field Screening Procedures

Stantec places the soil from the middle of the sampling interval into a plastic re-sealable bag. The bag is placed away from direct sunlight for approximately 20 minutes, after which the tip of a photo-ionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The PID measurement is recorded on the boring log. At a minimum, the PID or other device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Stantec trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, which is included in the final report.

Field Screening Procedures

Field screening is conducted during the excavation activities, and the excavated material is segregated into stockpiles based on concentrations above and below regulatory action levels. The stockpiled soil with concentrations above regulatory action levels is placed on an impervious surface (e.g., paving or plastic).

A photo-ionization detector (PID) or similar device is used to measure organic vapor concentration and segregate the excavated soil. The tip of the measuring device is placed approximately 3 inches above the excavated soil. At a minimum, the PID or other device is calibrated daily in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log.

Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis.

Stantec trained personnel describe the soil according to the Unified Soil Classification System and record the description, sampling method and sampling depth on the field notes.

Backfilling of Excavation

The excavation is backfilled using excavated stockpile material with concentrations below regulatory action levels and/or clean import fill. Import fill typically is virgin material obtained from a quarry; if the material is obtained from another source, it is selectively sampled to verify it does not contain constituents of concern.

Decontamination Procedures

Stantec decontaminates soil sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. De-ionized water may be used for the final rinse. The bucket of the excavating equipment is not typically decontaminated between sampling events.

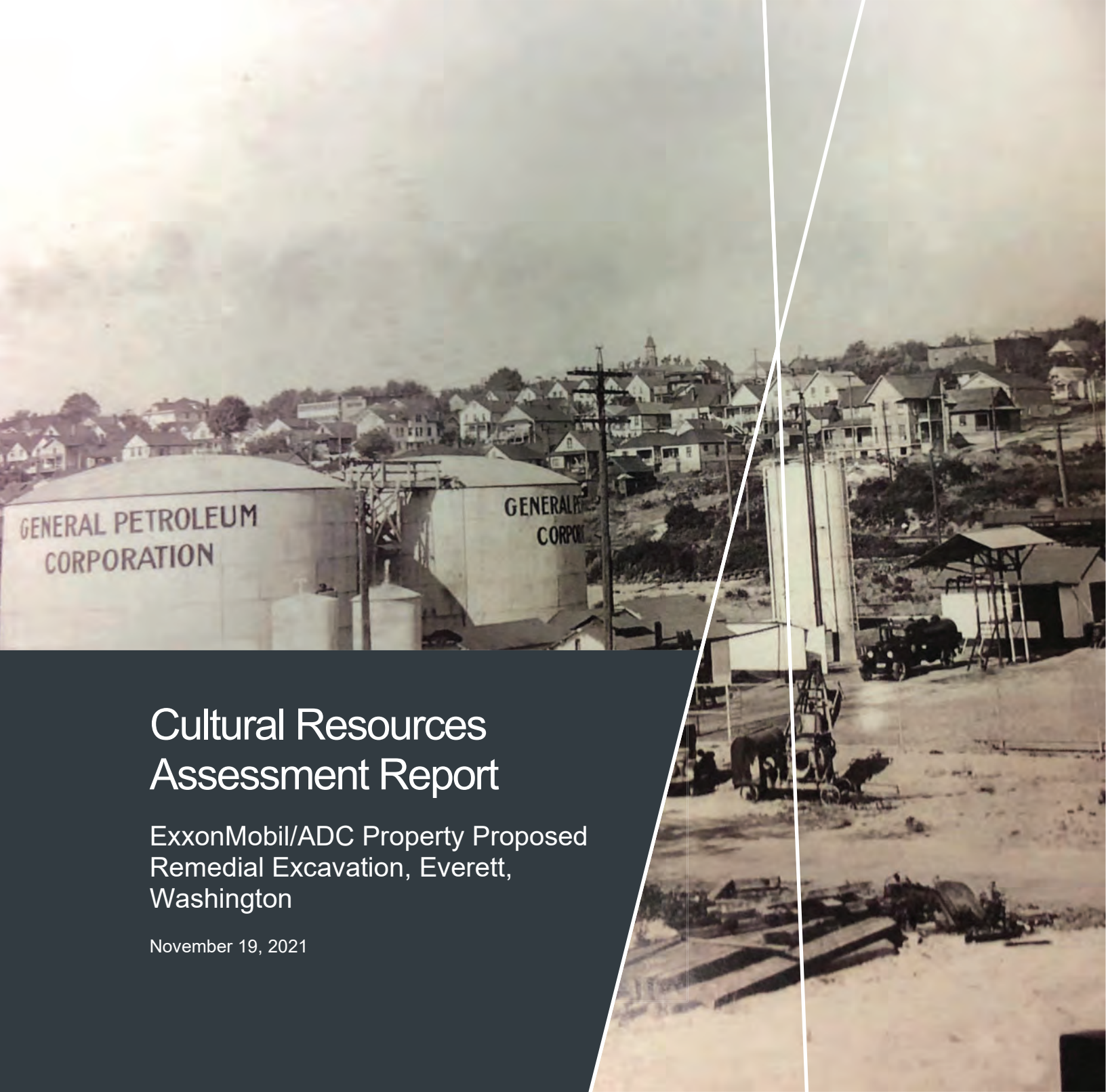
Waste Treatment and Soil Disposal

The stockpiled soil containing concentrations above regulatory action levels is removed from the site and transported under manifest to a client- and regulatory-approved facility for recycling or disposal, or remediated on site and placed back into the excavation. Decontamination fluids are stored on site in labeled, regulatory-approved storage containers. Fluids are subsequently transported under manifest to a client- and regulatory-approved facility for disposal or treated with a permitted mobile or fixed-base carbon treatment system.

APPENDIX E

Cardno's *Cultural Resources Assessment Report*, dated November 19, 2021





Cultural Resources Assessment Report

ExxonMobil/ADC Property Proposed
Remedial Excavation, Everett,
Washington

November 19, 2021

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and

American Distributing Co.
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Marysville, WA 98271
(360) 658-375

Project Name Cultural Resources Assessment
Report
ExxonMobil/ADC Property
Proposed Remedial Excavation,
Everett, Washington
Job Reference 0314476040
Version Number 1.0
Date November 19, 2021

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<https://ecology.wa.gov/DOE/files/02/02f2d202-9008-4049-ac30-63bc8c63f32d.pdf>

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Executive Summary

Cardno, Inc. (Cardno) conducted a cultural resources assessment for the proposed ExxonMobil/American Distributing Company (ADC) project in Everett, Washington. The project proposed to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation. Historical releases of petroleum products have been documented within the project area due to former operations of bulk petroleum storage, transfer, and distribution facilities and operations of other similar companies on nearby parcels. The project area is currently developed with a paved parking lot.

Results of the cultural resources assessment for the project area indicate a high level of human activity took place adjacent to the project area during precontact and historic times. Given the history of the project area and its immediate vicinity, Cardno concludes that the potential for encountering subsurface archaeological deposits beneath the historic fill layers is moderate to high. Cardno recommends that a monitoring and inadvertent discovery plan (MIDP) be implemented to minimize potential impacts to any currently unknown intact archaeological resources.

1.0 Introduction

Cardno, Inc. (Cardno) conducted a cultural resources assessment for the proposed ExxonMobil/American Distributing Company (ADC) project in Everett, Washington (Figure 1). This project is listed by the Washington State Department of Ecology (Ecology) as Cleanup Site 5182. Historical releases of petroleum products have been documented within the project area due to former operations of bulk petroleum storage, transfer, and distribution facilities and operations of other similar companies on nearby parcels. The purpose of the project is to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation. Proposed cleanup activities include installation of shoring walls, and excavation of impacted soils. Following excavation of contaminated soils, the project area will be backfilled, re-graded to preexisting contours, removal of shoring walls, and repaved.

The project area consists of 3.48 acres that are comprised of several tax parcels and portions of the City of Everett's (City) Right-of-Way (ROW). Parcel information is provided below (Table 1; Figure 2). Currently, the project area consists of a paved parking lot with no extant structures or buildings (Figure 3).

The cultural resources assessment consisted of a literature review of existing cultural resource records for previously recorded historic, ethnohistoric, and precontact archaeological and built environment resources; a review of any local, state, and national register nomination forms; a review of previously conducted cultural resources investigations; and a review of any known or potential Traditional Cultural Properties (TCPs) located within 1.0 mile (1.6 kilometer [km]) of the project area. This research included a records search at the Department of Archaeology and Historic Preservation's (DAHP's) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database. Additional resources that were consulted include historic-era aerial photographs, U.S. Geological Survey (USGS) maps, General Land Office (GLO) maps, Snohomish County atlases, and Sanborn Fire Insurance Maps.

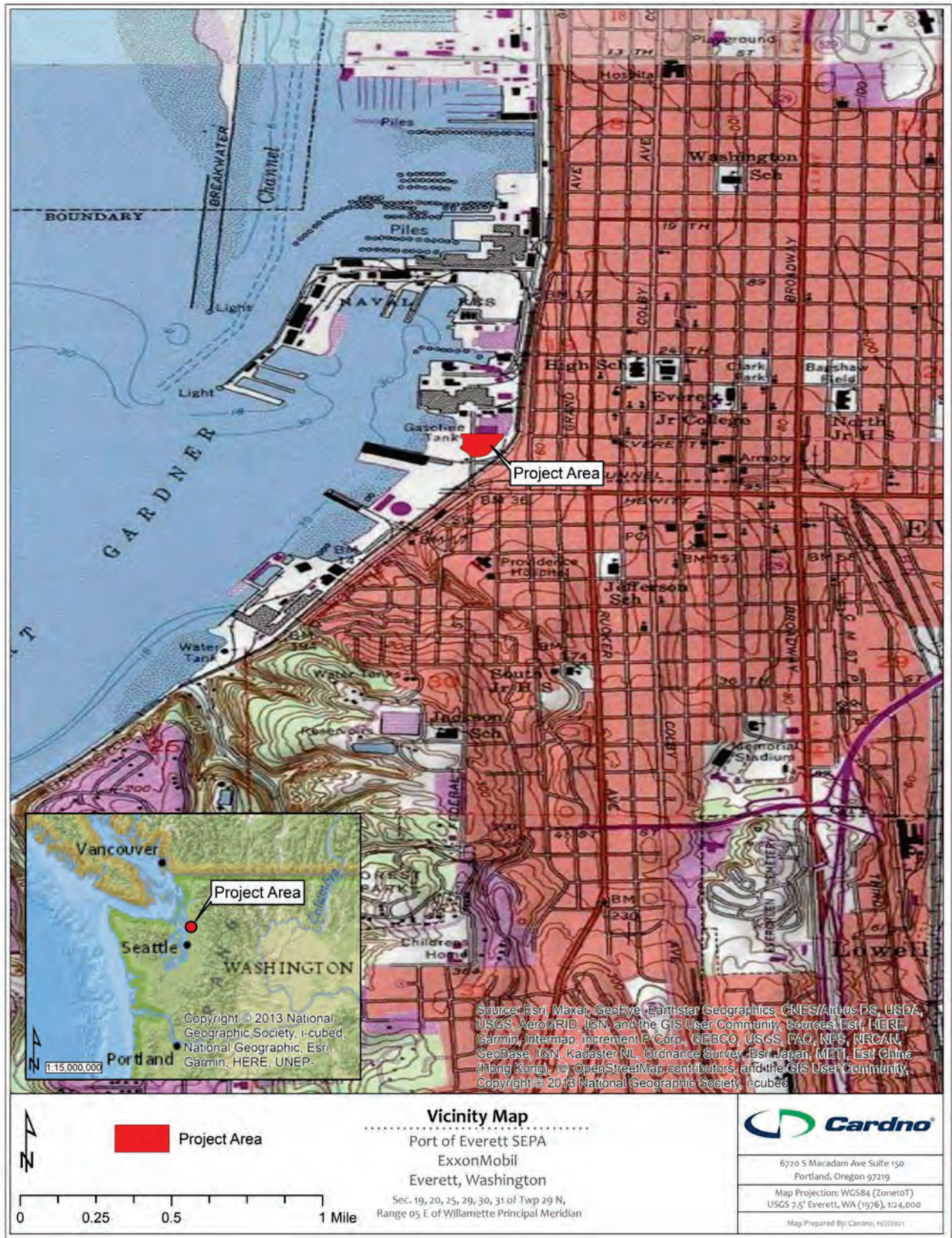


Figure 1. Project area and vicinity.

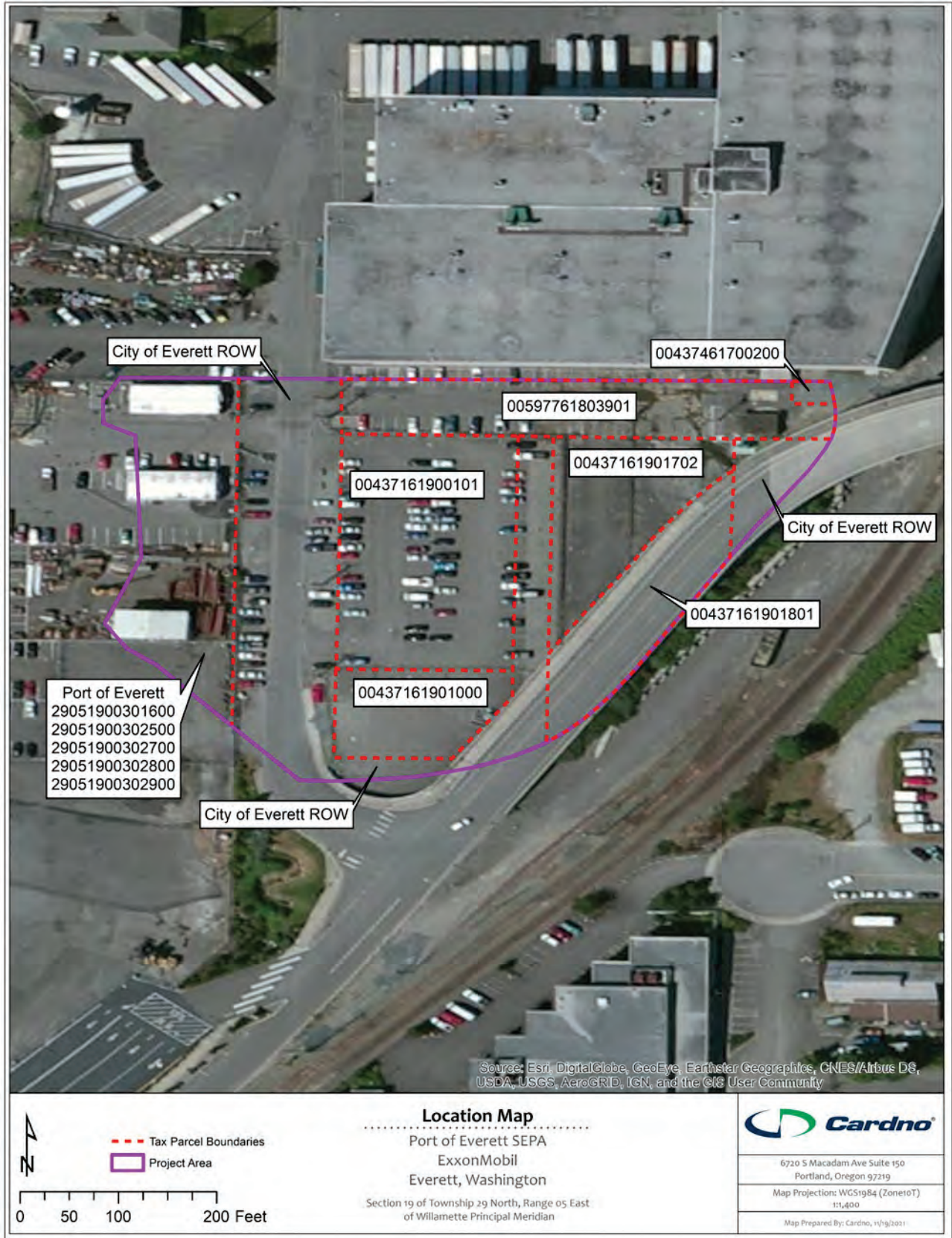


Figure 2. The project area denoting impacted Snohomish County tax parcels and City ROW.

Table 1. Snohomish County Tax Parcel Information.

Owners	Parcel Number(s)
Burlington Northern Railroad	00437161901702
City of Everett	00437161901801
Miller Trust (Cecilia Beverly Miller, beneficiary)	00437161900101
Mobil Oil Corporation	00437161901000
Port of Everett	00437461700200, 00597761803901, 29051900301600, 29051900302500, 29051900302700, 29051900302800, 29051900302900



Figure 3. Overview of project area, facing northeast.

2.0 Regulations

Cardno's cultural resources assessment was completed in compliance with Everett Municipal Code (EMC), Snohomish County Code (SCC), the State Environmental Policy Act (SEPA), and Revised Code of Washington (RCW). These regulations are discussed below. Additionally, information regarding other local, state, and federal regulations applicable to cultural resources is also provided.

2.1 Everett Municipal Code

EMC 19.28 outlines the process for identifying, listing, and protecting resources on the Everett Register of Historic Places and within historic overlay zones. Properties within historic overlay zones are governed by EMC 19.28.020 through 19.28.120. Criteria for placement on the Everett Register of Historic Places are described in EMC 19.28.130. Proposed changes to properties on the Everett Register are reviewed by the Everett historical commission per 19.28.140.

2.2 Snohomish County Code

SCC 30.67.340 requires developers and property owners to immediately stop work and notify the county, DAHP, and affected Indian tribes if archaeological resources are uncovered during excavation. It further stipulates that county permits issued in areas documented as containing archaeological resources require a site inspection or evaluation by a professional archaeologist in coordination with affected Indian tribes.

SCC 20.32D outlines the identification, evaluation, and protection of archaeological and historic resources within Snohomish County that are listed on the Washington State Archaeological Site Inventory. Additionally, it directs the preservation and rehabilitation of eligible historic properties for future generations. SCC 30.32D.020 established the Snohomish County Register of Historic Places, which includes historic buildings, sites, structures, objects, and districts within the county. SCC 30.32D.030-060 directs property designation to and removal from the Snohomish County Register of Historic Places, as well as alterations of properties on the register.

SCC 20.32D.070-100 outlines the process for obtaining and working under a certificate of appropriateness, and zoning. SCC 20.32D.200 requires recordation of archaeological sites. Additionally, completion of an archaeological report or relocation of a project is required for any construction, earth movement, clearing, or other site disturbance of a known archaeological site or any development application proposed on non-tribally owned, fee-simple properties designated Reservation Commercial on the Snohomish County Future Land Use Map. SCC 20.32D.220 outlines the process to follow if human remains or archaeological resources are found during construction, earth movement, clearing, or other site disturbance.

Lastly, SCC 30.32D.300 allows for an appeal process for any building permit issued with conditions imposed pursuant to this chapter. An appeal may occur as a Type 1 decision pursuant to SCC 30.71.

2.3 State Environmental Policy Act

The SEPA (RCW 43.21C) and its implementing rules contained in Washington Administrative Code (WAC) 197-11 require applicants to document cultural and historical significance that may be affected by project activities. The SEPA review process provides notice to all affected tribal, state, and private entities.

Per WAC 197-11-960, the SEPA checklist submitted to the local planning authority with an application for development review includes the following questions, which must be satisfactorily addressed to demonstrate that a project will not have a significant adverse impact on cultural and historic resources:

- a. *Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.*
- b. *Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.*

c. *Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archaeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.*

d. *Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.*

2.4 Revised Code of Washington 27.44 and 27.53

Precontact and historic archaeological sites are protected by several Washington state regulations on both public and private lands. RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the DAHP before excavating, removing, or altering Native American human remains or archaeological resources in Washington. A failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090.

If a person(s) violates this statute and knowingly disturbs or alters an archaeological site, the DAHP is allowed to issue civil penalties of up to \$5,000, in addition to site restoration costs and investigative costs per RCW 27.53.095. Restorative and monetary remedies do not prevent concerned Indian tribes from undertaking civil action in state or federal court or law enforcement agencies from undertaking criminal investigation or prosecution. If human remains and/or burials are disturbed, RCW 27.44.050 allows an affected Indian tribe to undertake civil action. Additionally, the excavation of human remains without a permit is a felony.

2.5 Revised Code of Washington 68.60

RCW 68.60 requires “expeditious” notification of local law enforcement and the coroner if skeletal human remains are discovered. Failure to notify is considered a misdemeanor.

2.6 Washington Administrative Code 25-48-060

The complete requirements for filing an archaeological excavation permit can be found in WAC 25-48-060. In the state of Washington, permits are required for alterations (e.g., excavation, removal, and collection of archaeological materials) at all precontact archaeological sites and at historic archaeological sites that are eligible for or listed in the National Register of Historic Places (NRHP).

2.7 Governor’s Executive Order 21-02

In 2021, Washington Governor Jay Inslee signed executive order 21-02, which supersedes the previous GEO 05-05. GEO 21-02 requires the preservation and protection of Washington’s cultural resources, which are defined as archaeological and historical sites, Native American sacred places and landscapes, and sites, buildings and places that hold special cultural historical, and spiritual significance. The GEO requires state agencies to review their capital construction projects and land acquisitions made for the purpose of a capital construction project that are not undergoing review under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) with the Washington State Department of Archaeology and Historic Preservation (DAHP) and affected Indian tribes to determine potential impacts to cultural resources. GEO 21-02 outlines the steps of review and consultation that should be undertaken as early in the project planning process as possible. In the event a culturally significant site will be impacted by a capital project, the state agency must work with the DAHP and affected Indian tribes on appropriate archaeological survey and mitigation strategies consistent with state and federal laws. Additionally, the state agency must take reasonable action to avoid, minimize, or mitigate adverse effects to the resource.

2.8 Washington Heritage Register

The Washington Heritage Register (WHR) is an official listing of historically significant sites and properties found throughout the state and includes districts, sites, buildings, structures, and objects that have been identified and documented as being significant in local or state history, architecture, archaeology, engineering, or culture. The WHR is governed by several state laws, including Senate Bill 363, RCW 27.34.200, and WAC 25-12.

Any subdivision of state government or recipient of state funds must comply with the SEPA and Executive Order 21-02. These programs require that significant properties, specifically those listed in or eligible for the WHR, be considered when state undertakings (e.g., permits, grants, construction) affect historic and cultural values. If significant resources are identified, the DAHP considers the effects of a proposed project on such resources and makes a professional recommendation for appropriate treatments or actions. The DAHP does not regulate the treatment of properties that are found to be significant, and the local governing authority may choose to uphold the DAHP's recommendation and may require mitigation of adverse effects to significant properties.

2.9 National Register of Historic Places

The NRHP (16 U.S. Code 470a), created under the National Historic Preservation Act of 1966, as amended (16 U.S. Code 470 et seq.), is the federal list of historical, archaeological, and cultural resources worthy of preservation. Resources listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, prehistory, architecture, archaeology, engineering, and culture and that possess integrity of location, design, setting, material, workmanship, feeling, and association. The NRHP is maintained by the National Park Service (NPS) on behalf of the Secretary of the Interior (SOI). The DAHP administers the statewide NRHP program under the direction of the State Historic Preservation Officer, located in Olympia, Washington. The NPS has developed NRHP Criteria for Evaluation (36 Code of Federal Regulations [CFR] § 60.4) to guide the evaluation of cultural resources that may be either listed in or eligible for the NRHP. The NRHP Criteria of Evaluation are:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history.

NPS Bulletin No.15, "How to Apply the National Register Criteria for Evaluation," provides guidance on evaluating resources for listing in the NRHP. Archaeological sites are primarily assessed under Criterion D. While cultural resources may be present within the project area, if they do not meet the requirements for listing in the NRHP, they are not considered historic properties. Cultural resources less than 50 years old do not meet the NRHP criteria unless they are of exceptional importance, as described in Criteria Consideration G (36 CFR Part 60) and NPS Bulletin No. 22, "How to Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years."

3.0 Environmental Setting

The project area lies within the greater Puget Lowland physiographic province, which is a low-lying area between the Cascade Range to the east and the Olympic Mountains to the west. Puget Sound was

shaped by widespread continental glaciation that extended south from British Columbia to the northern Puget Lowland and along the western flanks of the Cascade Mountains (Miss 2008). This area is also known as the Puget Sound Trough physiographic province, which extends to the Cowlitz and Chehalis Rivers (Franklin and Dyrness 1988). The Vashon Stade of the Fraser Glaciation was the last glacial maximum in the region and is dated between 18,000 and 14,000 years before present (BP) (Easterbrook 2003). Rapid deglaciation, which saw the occurrence of meltwater channels and temporary ice marginal lakes, occurred after this glaciation. The land experienced isostatic rebound between 13,000 and 7000 years BP as global sea levels rose and deltas formed at the head of the Duwamish Valley, shaping the Puget Sound shoreline (Dragovich et al. 1994; Miss 2008). By 5000 years BP, the Puget Sound sea level was within 6.6 to 9.8 feet (2 to 3 meters [m]) of its current level (Kelsey et al. 2004; Sherrod et al. 2000).

The project area lies within the *Tsuga heterophylla* (western hemlock) vegetation zone in the Puget Lowland, which provides a highly productive ecological system with a complex mosaic of microenvironments (Franklin and Dyrness 1988). This vegetation zone is characterized by forests of western hemlock, western red cedar, and Douglas-fir. Shrub cover consists of sword fern, salal, Oregon grape, ocean spray, huckleberry, and red elderberry. The diversity of floral and faunal species in the area has decreased due to human settlement, which has led to a significant loss of faunal habitat. Additionally, historical and modern contaminants within Port Gardner Bay have significantly impacted mudflats, estuaries, tidal marshes, and shrub wetlands. The National Oceanic and Atmospheric Administration's Damage Assessment, Remediation, and Restoration Program (2021) notes that:

Releases of hazardous substances into Port Gardner Bay have resulted from industrial and municipal processes since the early 1900s, including factories, spills during cargo transfer and refueling, storm water runoff through contaminated soils at upland facilities, discharge of contaminated groundwater, and lumber operations, such as sawmills, and pulp and paper mills.

Prior to historical and modern impacts, the *Tsuga heterophylla* vegetation zone could support large terrestrial animals like elk, deer, black bear, and coyote and smaller mammals like rabbit, squirrel, racoon, beaver, and river otter. Currently, the project area is located within modified industrial landscape with paved ground surface. Recent subsurface investigations note that the near-surface soils consist of a heterogeneous mixture of fill materials. The fill materials consist of very loose to medium dense, brown, brownish gray, and gray silty sand and sand with areas of wood and brick debris extending to depths of approximately 5 to 10 feet below ground surface (bgs). Gray silty sand and silt and dark-brown to black peat mixed with wood debris are encountered beneath the shallow fill and extend up to 20 to 27 feet bgs (Wood 2019, Cardno 2020a, 2020b).

3.1 Archaeology

The earliest known occupations in western Washington, termed Paleo-Indian, are evidenced by the appearance of large, fluted projectile points dating to approximately 12,800 years BP (Ames and Maschner 1999; Carlson 1990). Paleo-Indians were primarily hunter-gatherers with low populations and high levels of mobility. Some researchers have argued that these early people were maritime oriented (Carlson 2003; Dixon 1993; Fedje and Christensen 1999; Fladmark 1979). In western Washington, sites from this period are rare. Much of the late Pleistocene terrain was uninhabitable due to glaciers, and the lands that were occupied by Paleo-Indians were predominately coastal reaches. During the glaciation period, ocean levels fell almost 400 feet globally (Kirk and Daugherty 2007), but with the onset of the warming Holocene, ocean levels rose and submerged many of these coastal sites. However, some sites are not submerged and instead are located above the present shoreline due to eustatic, tectonic, and isostatic effects that vary throughout the region (Fedje and Christensen 1999).

The Archaic period dates from approximately 12,500 to 6,400 years BP (Ames and Maschner 1999; Carlson 1990). Archaic-period sites, similar to Paleo-Indian sites, are poorly represented. Changes in sea level and vegetation have obscured many Archaic-period sites along the coast (Ames and Maschner

1999). However, as the glaciers receded, people were able to occupy larger expanses in the interior of the Puget Sound. Archaic-period peoples likely maintained small populations and high levels of mobility, and focused on a combination of maritime, littoral, and terrestrial economies. Archaic-period occupations are largely characterized by stone tool assemblages that are typically composed of large, stemmed lanceolate projectile points and bifaces. In addition, the Pacific Northwest Archaic period saw an introduction of microblades, which are sometimes present in stone tool assemblages (Ames and Maschner 1999).

Pacific-period sites date from approximately 6,400 to 250 years BP. The period ends at the introduction of smallpox to the region (Ames and Maschner 1999). The Early Pacific period (6,400 to 3,800 years BP) was marked by the increased use of marine resources, the appearance of human burials in middens and cemeteries, a diversification in subsistence activities, the disappearance of microblade technology, and the increased use of bone, antler, and ground stone tools. Major developments also included the appearance of ground stone celts (adze blades) and a proliferation in chipped-stone tool forms and styles, and decorative/ornamental pieces that likely represent contact and trade with groups in neighboring cultural areas (Kirk and Daugherty 2007). The Middle Pacific period (3,800 to 1,800/1,500 years BP) displays major developments including the appearance of long-term settlements (plank houses), intensification of salmon capture (appearance of wooden fish weirs and girdled/drilled net sinkers), and a diversification in tool form and style. Late Pacific period (1,800/1,500 to 250 years BP) developments are represented by the appearance of heavy-duty woodworking tools, an overall decline in the use of chipped-stone tools, and an increase in funerary ritual/burial activities. Sea levels became stable by the start of the Middle Pacific period, and sites representing the Middle and Late Pacific periods are located across the Northwest Coast region (Ames and Maschner 1999).

3.2 Ethnography

The project area lies within the traditional territory of the Snohomish. Since time immemorial, the Snohomish people lived in various locations along the Snohomish River from present-day Monroe to the mouth of the river near Everett, on Camano Island, and on Whidbey Island (Ruby and Brown 1992:212; Tweddell 1974). The region was utilized for resource gathering, hunting, and villages/seasonal habitations. However, there are no known ethnographic sites within the immediate project area (Waterman et al. 2001).

The Snohomish spoke the southern dialects of Lushootseed—a Salish language (Suttles and Lane 1990:486). The Snohomish people followed a seasonal settlement pattern. Winter villages, composed of one or more cedar plank houses where families gathered in the late fall, were typically located along waterways, such as at the mouth of the Snohomish River, river confluences, or protected shorelines (Haeberlin and Gunther 1930; Lane and Lane 1977). During the winter months, they relied on stored foods supplemented by local hunting and fishing (Suttles and Lane 1990).

Coast Salish peoples developed a complex social and religious system in part due to the abundance of food and raw materials (e.g., wood, plants, stone) (Haeberlin and Gunther 1930). Potlatches and spirit quests were important activities in the pursuit of spiritual power, in addition to asserting control over resources and neighboring groups (Elmendorf 1971). Social stratification existed among Coast Salish groups, where villages consisted of elite, commoner, and slave classes (Ames 2001; Grier 2003; Tollefson 1987).

Winter housing consisted of large, multifamily longhouses constructed of cedar planks. Sleeping platforms lined the walls, and storage shelves for winter supplies were typically located on the walls above these sleeping platforms. Fires were located near the sides, and the central area was used as a passageway. Shed-roof houses were a common design among the Coast Salish in the Puget Sound region (Suttles 1991). This house type easily allowed for the addition of rooms when populations increased, such as during winter months, and for the reduction in house size when occupants left for summer food collection

rounds (Suttles 1991). Often, the different placements of sleeping platforms and individual fires portrayed status, where those with the highest status lived in the back of the house and commoners and slaves lived closer to the entryways (Suttles 1991).

During the spring, summer, and fall, people would journey from central villages to temporary camps. Camps were located along streams during salmon runs while smaller groups would hunt, fish, and gather plant resources. Gathering was most intensive during spring and summer. Plants such as cattail (*Typhaceae* spp.), cranberry (*Oxycoccus* spp.), wapato (*Sagittaria latifolia*), and salmonberry (*Rubus spectabilis*) shoots were collected from wetlands, such as those found along Lake Stickney (located directly west of the project area), and prairies were visited for gathering camas (*Liliaceae* spp.) bulbs (Haeberlin and Gunther 1930; Turner 1976).

A typical summer house was constructed for short-term occupation, and they were typically tipi or square-shaped. Mats were placed horizontally over a frame of poles to create the tipi, while square houses were a lean-to type form, with mats placed over a wooden structure with a gabled or single pitch roof. Short-term occupation mountain camps were made using a similar square form, but covered with boughs of various tree species. Another style of summer house consisted of four corner poles with horizontal poles placed on top to create a gable. Cedar twigs held the framework together, while mats covered the roof and three sides (Haeberlin and Gunther 1930).

The Tulalip Reservation was authorized under the Treaty of Point Elliot in 1855, and enlarged in 1873, as the home for several indigenous groups including the Snohomish, Stillaguamish, Snoqualmie, Skykomish, and other allied bands living in the region (Ruby and Brown 1992; Tulalip Tribes 2014). Some among these groups moved to the reservation, while others remained living on their traditional lands. The combined tribes became known as the Tulalip Tribes.

Cardno is not aware of any known ethnographic place names within the project area or immediately adjacent. However, there are several ethnographic place names recorded in the general vicinity of the project area and near the mouth of the Snohomish River (Waterman 1922; Waterman et al. 2001:336-342). Non-English names are Lushootseed when available.

16 η us η usič (Watermann orthography: *Os³a/s1tc*) translates to “chasing a fish here and there” near an estuary between Steamboat and Union Sloughs.

16a *bəlu η əb* (Watermann orthography: *PE'ls1b*) translates to “boiling,” for an area at the mouth of the main Snohomish River channel.

17 *čik^wucid* (Watermann orthography: *Ctcqo'tsid*) translates to “that which chokes up the mouth of something,” for a small island located on the north side of the Snohomish River mouth.

18 *sex^wčulalq^w* (Watermann orthography: *SExwtculalkw*) is noted for a sharp point of land running toward the Ctcqo'tsid island.

19 *hibu'əb* (Watermann orthography: *Hibu'^βub*) translates to “place where water boils out of the ground,” for a former village site south of the Snohomish River mouth.

20 Watermann orthography: *SEq^wsu³ub* is noted for a small promontory with a slough that runs parallel to the shore.

21 *sluluw#* (Watermann orthography: *SLu'luw1L*) translates to “little perforation for a canoe,” for a narrow channel passing behind an island.

22 *λ'ux^wat* (Watermann orthography: *tL'o'hwaL*) translates to “a cold spring” for a spot on the river bank opposite Everett.

3.3 Historical Context

Cardno referenced GLO land patents and cadastral maps for Township 29 North, Range 5 East as well as Snohomish County atlases and USGS topographic survey maps to determine changes in built environment features (e.g., piers, docks, railroads, buildings, and/or roads) in or near the project area (Table 2). According to the results of a land patent search through the Bureau of Land Management (BLM), in 1876 Dennis Brigham was granted a total of 160.15 acres for Lot/Tract 2, Lot/Tract 3, and Lot/Tract 4 within Section 19 of Township 29 North, Range 5 East. Brigham, a carpenter from Massachusetts, arrived in the Everett area in 1861 to begin the homesteading process. Considered the first permanent settler in the area, Brigham constructed a cabin on his acres near Port Gardner Bay and lived a solitary life (Oakley 2005). During the early 1860s, a lone telegraph operator "...and Brigham were the only settlers between Mukilteo and the mouth of the Snohomish River for many years" (Whitfield 1908: 285). Later, John Auson King claimed Lot/Tract 1, immediately north of Brigham within Section 19 (BLM 1874). These lands grants were authorized under the Land Act of 1820 and the Homestead Act of 1862. These acts reduced the price of federal lands and gave citizens up to 160 acres each of public land for improvement.

Table 2. Results of Cartographic Analysis.

Year	Author/Company	Description of project area
1869	BLM	The project area is located within Section 19, which is partially submerged in Port Gardner Bay. A trail extends along the east bank and connects to a telegraph office and through property homesteaded by "Brigam."
1902	Sanborn Map Co.	Federal Ave extends north through the railroad and ends at the west extent of Everett Ave. Lot/Tract 618 and 619 are labeled, but show no company or ownership. Block 619 contains 30 structures consisting of dwellings with associated outbuildings. Block 618 depicts 11 more structures labelled "Squatters Shacks." Area noted as "marsh."
1910	Anderson Map Co.	Several rail spurs extend west to docks and piers owned by G.N. Ry. Co., N.P. Ry. Co., and Everett Imp. Co. project area is situated west of Everett Ave terminus with railroad and tideland additions (labeled 618 and 619).
1914	Sanborn Map Co.	"Squatters shacks" have been removed from Blocks 618 and 619. Shoreline cuts northeast from intersection of Federal Ave and Everett Ave. Two structures are depicted in the southwest area of Block 618 near the waterline. Area noted as "marsh."
1927	Chas. F. Metsker	Project area is depicted west of main roadways within railroad and dock area of Port Gardner Bay. Sections 20 and 19 are not labeled.
1934	Kroll Map Co.	Project area is noted within an undetailed area heavily utilized by railroad and docks.
1936	Chas. F. Metsker	G.N. Rwy. Depicted east of project area with spurs to "City Dock" and other businesses. North of project area is Clark Nickerson Lbr. Co., and docks to west noted as 13, 14, and 21.
1943	Kroll Map Co.	Same as Kroll (1934).
1950	Sanborn Map Co.	Significant development of Blocks 618 and 619. General Petroleum Corporation, Gilmore Oil Co., and the Associated Oil Company have all constructed warehouses and fuel oil tanks. Within Port Gardner Bay there is a pier (Standard Oil Co.) and an outfitting basin.
1960	Thos. C. Metsker	Federal Street depicted within its current alignment. The project area is noted within property owned by Standard Oil. The block (619 and 618) contains storage tanks.
1960	Kroll Map Co.	Same as previous.

Year	Author/Company	Description of project area
1975	Chas. F. Metsker	Scott Paper Co. is north of the project area. Standard Oil property with storage tanks is located within the project area.
198x	Chas. F. Metsker	Same as previous.
1992	Metsker Maps	Same as previous.

The 1869 survey plat image for Township 26 North, Range 5 East, depicts a telegraph line aligned north-south along the east side of Port Gardner Bay. A “Telegraph Office” is noted south of Section 19. This telegraph line “followed along the beach from Seattle to Whatcom” (Whitfield 1908: 285). In the southeast quarter of Section 19, a small cabin is noted along with the misspelled label of “Brigam” (BLM 1869). In 1890, the Brigham homestead property was purchased by Wyatt and Bethel Rucker with plans to create a townsite called “Port Gardner” (Oakley 2005). During the next year, the Ruckers became associated with Henry Hewitt Jr., Charles L. Colby, and other optimistic landowners and incorporated the Everett Land Company. By 1891, the main thoroughfare called Hewitt Ave was cut east to west and 100 feet wide.

Development of the townsite, now called Everett after Charles Colby’s son, continued with stump removals, street grading, and the sale of Everett Land Company lots (Oakley 2005; Port of Everett 2021). The Everett Land Company won ownership of the waterfront in 1892. In April of 1893, Everett was incorporated and boasted more than 5,600 citizens supported by streetlights, streetcars, sawmills, railroads, and residential and commercial expansion. However, the Panic of 1893 led to a withdrawal of investments and money in the Everett Land Company. The holdings of the Everett Land Company were transferred to the Everett Improvement Company in 1899 (Oakley 2005).

Evidence of development revitalization is visible in a 1902 map in the numerous land lots divided and numbered to the East Waterway shoreline of Port Gardner Bay (Figure 4; Sanborn Map Co. 1902). Federal Ave extended north through the Great Northern Coast Line and terminated at the westerly extent of Everett Ave. At this time, no company or business name was noted on the Sanborn Fire Insurance Map within the project area. Within properties directly north of the project area, large structures are depicted for the Everett Flour Mill Co. and the Clark Nickerson Lumber Co.

The color-coded key indicates that within Block 619 within the project area, structures consisted of “frame building” (Sanborn Map Co. 1902). The detailed map page for Block 619 contains 30 frame structures, all dwellings and associated outbuildings, situated around a marshland at the center of the block (Figure 5). Within each dwelling, the maps include a notation of “S.P.,” which is specially called out on the key map introduction: “NOTE Practically all dwellings with a “S.P.” (Stove pipe) are cheap, unpainted shacks” (Sanborn Map Co. 1902: Key Map). Eleven additional “S.P.” buildings consisting of dwellings, outbuildings, bath house, and boat house, are depicted within Block 618 to the north of the project area, and noted as “Squatters Shacks” (Sanborn Map Co. 1902).

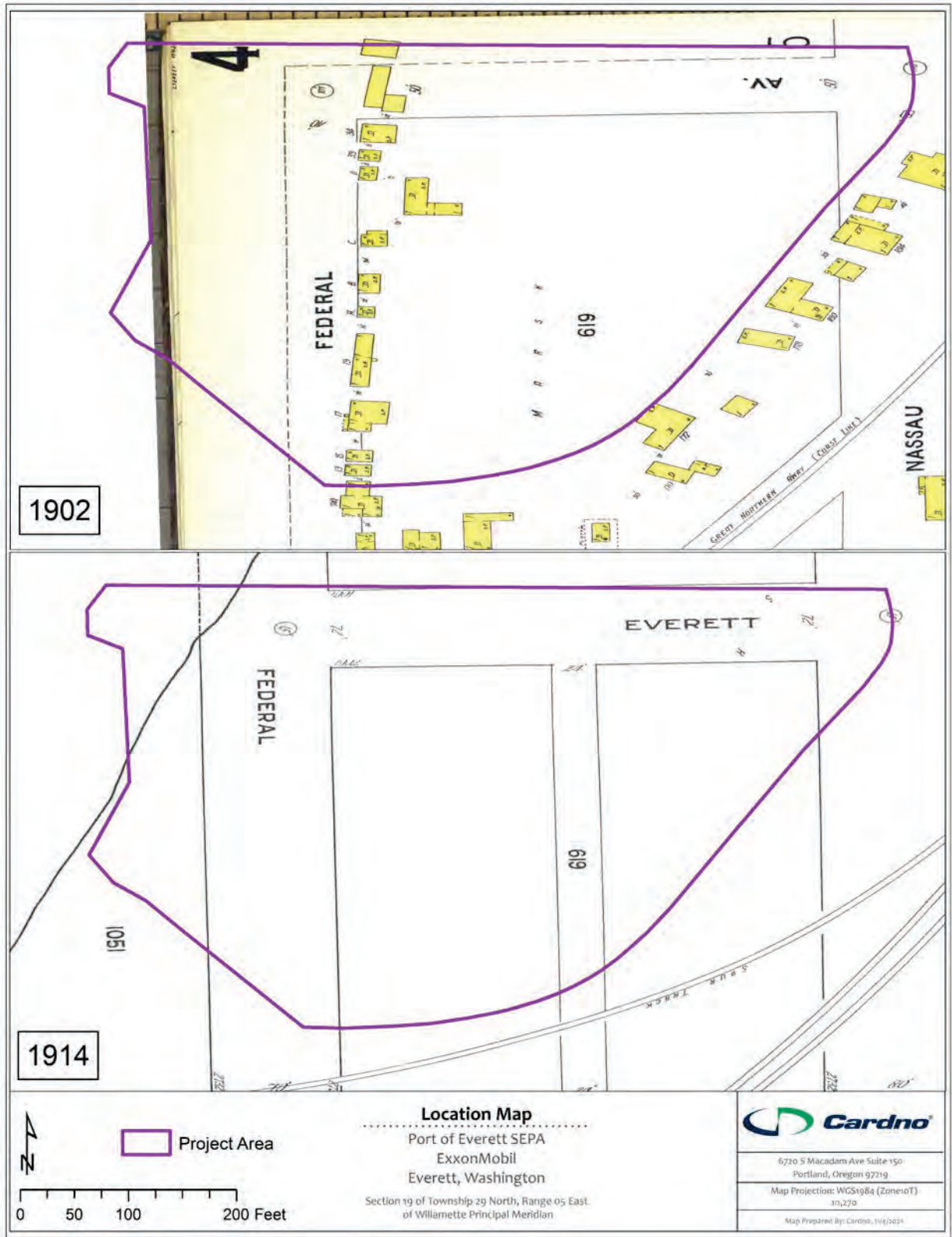


Figure 4. Details from 1902 and 1914 Sanborn Fire Insurance Maps (Sanborn Map Co. 1902, 1914).

Historical maps illustrate a changed landscape. In 1910, railway spurs extended west from the mainline to docks and piers owned by “G.N.Ry.Co.,” “N.P.Ry.Co.,” and “Everett Imp. Co.”:

“G.N.Ry.Co.” – Great Northern Railway

“N.P.RY.Co.” – Northern Pacific Railway

“Everett Imp. Co.” – Everett Improvement Company

By 1914 the “squatters shacks” north of the project area had been removed, and increasing development of piers and docks is evident (see Figure 4; Anderson Map Co. 1910; Sanborn Map Co. 1914). The position of the site between the railroad and waterfront was highly conducive to industrial uses. Between 1914 and 1950, the east shoreline of Port Gardner Bay was significantly filled and artificially extended into the East Waterway. Additionally, docks and piers expanded the industrial and commercial landscape west of the historical extent of Federal Ave (Sanborn Map Co. 1950).

By 1925, the northern part of the project area contained at least two large “General Petroleum Corporation” tanks, three smaller unlabeled tanks, and three gable-roof outbuildings just south of Everett Avenue. The project area spans Federal Avenue, across which was one large “General Petroleum Corporation” warehouse complex near the shoreline. Predecessors of ExxonMobil, owned the project area site beginning in 1927 (Washington Department of Ecology 2021).

The warehouse complex contained automobile truck storage, an oil and grease warehouse, a wash rack room, a boiler room, and an oil in steel drum staging yard adjacent to a wooden bulkhead (Figure 5; Sanborn Map Co. 1939 [Revised through June 1955]). By 1947 development within the project area had been expanded significantly to the south (Figure 6). Additional infrastructure constructed included several cylindrical petroleum tanks each containing 25,000 gallons of gasoline, eight outbuildings including a wooden office building, pump room, and warehouses, and a steel filling rack (Figures 5, 7, and 8; Sanborn Map Co. 1939 [Revised through June 1955]). The shoreline has not been modified with fill since approximately 1950 (Figure 9). An Everett USGS map from 1953 shows the area developed with gasoline tanks and a pier directly adjacent to the company warehouse complex (Figure 10). It does not appear the eastern portion of the project area was ever significantly developed.

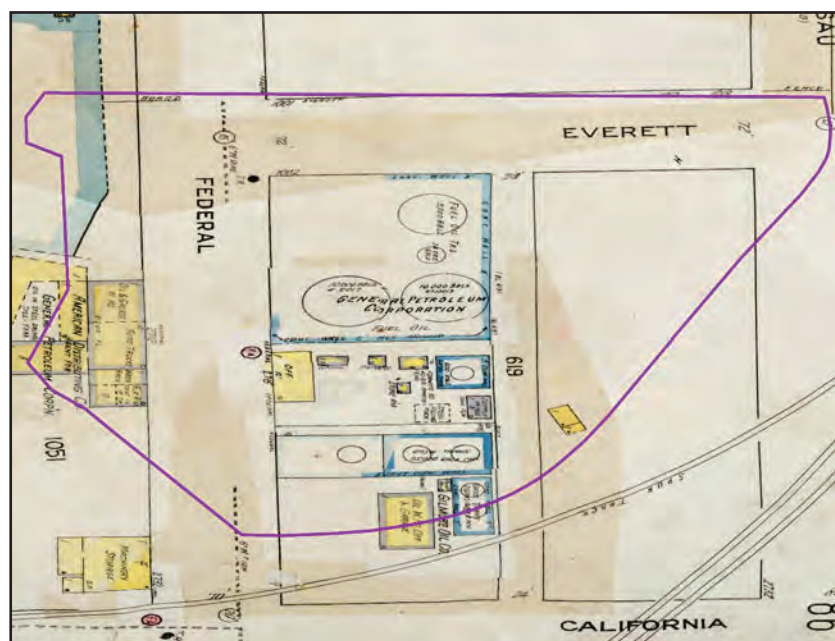


Figure 5. Project area displayed on 1939 Sanborn Fire Insurance Map. (Sanborn Map Co. 1939 [Revised through June 1955])



Figure 6. Project Area depicted on aerial imagery from 1947 (Image courtesy of ExxonMobil 2021).



Figure 7. Photograph of project area viewed facing north, taken from south end of site (Washington Department of Ecology 2021).



Figure 8. Undated photograph showing gasoline infrastructure after General Petroleum Corporation was rebranded to Mobilgas. The office building on the site is at the right. (Washington Department of Ecology 2014:65)

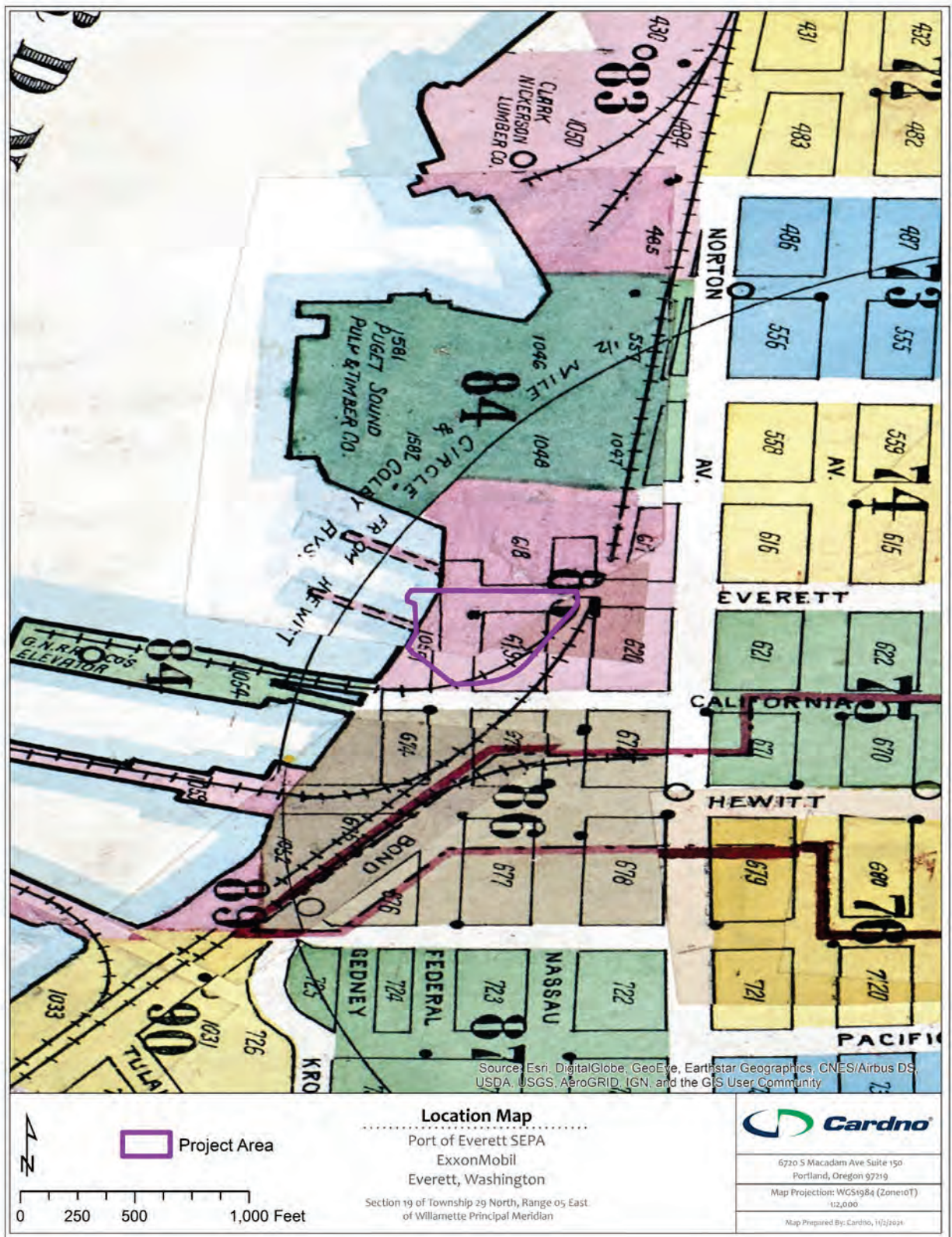


Figure 9. Project Area depicted on 1950 Sanborn Insurance Map (Sanborn Map Co. 1950).

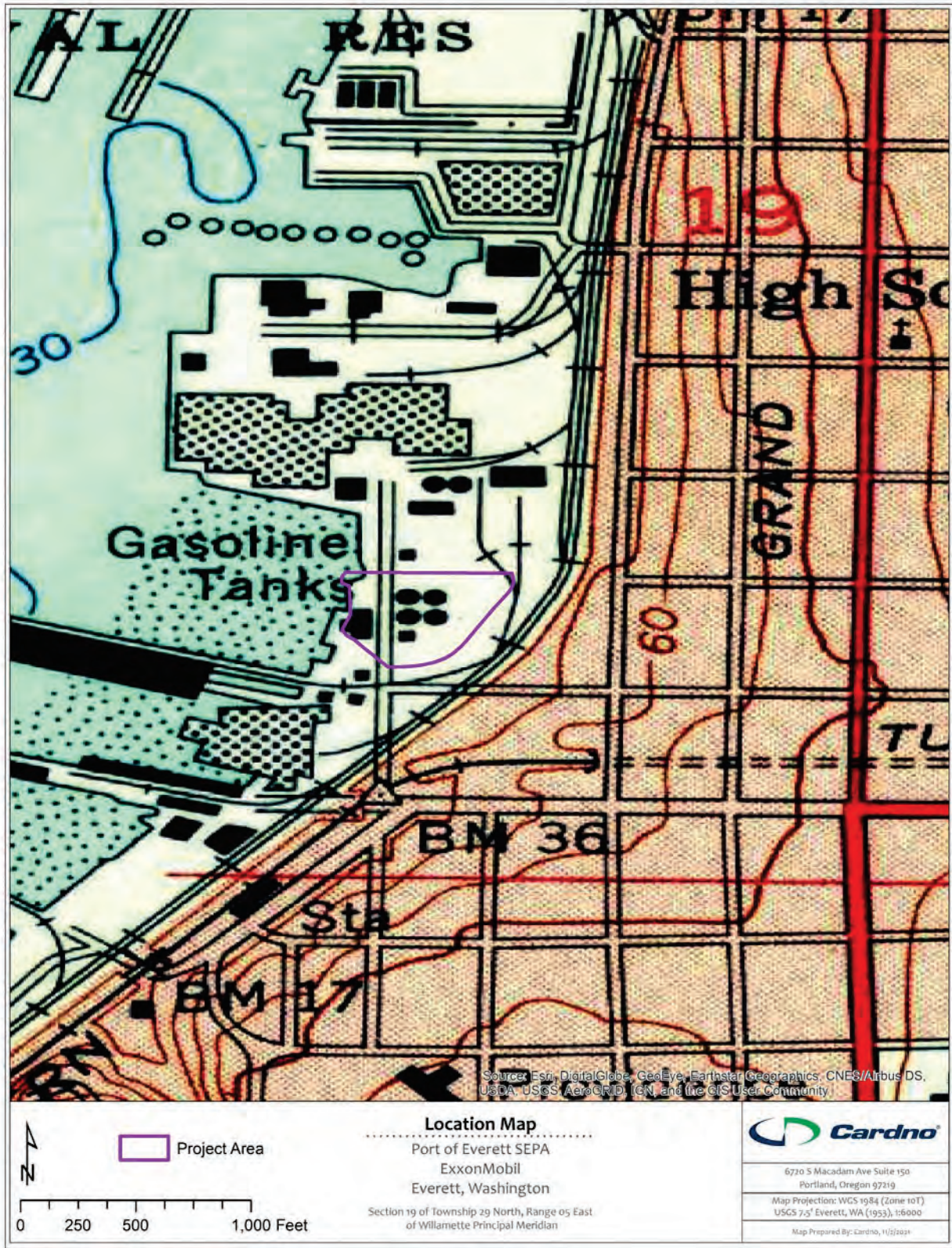


Figure 10. Project area depicted on the 1953 Everett USGS 7.5-minute quadrangle (USGS 1953).

In 1974, Mobil Oil sold the northern part of the project area to A.P. Miller for use by the American Distributing Company (ADC) who continued petroleum operations until 1990 (Washington Department of Ecology 2021). By 1977 the warehouse complex across Federal Avenue and the office building had been demolished (Figure 11). Mobil Oil ceased petroleum operations on the project area in 1987. All remaining infrastructure at the site was demolished between 1998 and 2002, and the project area was used as a parking lot (Washington Department of Ecology 2021). In late 2003 Terminal Avenue was developed adjacent to the site. The project area experienced continued development and change over several years precluding the identification of a particular year or period of importance of the petroleum infrastructure which was once extant.



Figure 11. A 1977 aerial photograph of the project area (Washington Department of Ecology 2021).

3.1 Literature Review

Cardno archaeologists conducted a background search and literature review of existing cultural resource records; local, state, and national register nomination forms; previous cultural resources investigations; and any known or potential TCPs in and within 1.0 mile (1.6 km) of the project area. According to the DAHP's predictive model available on the WISAARD online database, there is a very high risk of encountering buried precontact archaeological deposits in the project area.

3.1.1 Previous Investigations

The background search identified 15 cultural resources investigations that have been previously conducted within 1.0 mile (1.6 km) of the current project between 1975 and 2020 (Table 3). Seven investigations were surveys, two involved construction monitoring, two were historic structures surveys, three provided larger prehistoric and historic context for the area, and one was a monitoring and discovery plan. Recently, four cultural resources investigations fall within or immediately adjacent to the project area, as plotted by WISAARD (see Table 3): Johnson 2000; Rinck et al. 2013; Udem et al. 2014; Johnson 2020.

Table 3. Cultural Resources Investigations within 1.0 Mile of the project area (n = 15).

Year	Author	Report Title	NADB Number	Report Type	Location Relative to project area
1975	Dunell and Fuller	An Archaeological Survey of Everett Harbor and the Lower Snohomish Estuary-Delta	1332098	Survey Report	project area within Study Area
1987	Blukis Onat	Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Northern Puget Sound Study-Unit	1349367	Overview	Overview of Area
1988	Evans-Hamilton, Inc.	The Location, Identification and Evaluation of Potential Submerged Cultural Resources in Three Puget Sound Dredged Material Disposal Sites	1340504	Survey Report	0.84 mile west
1991	Miss and Campbell	Prehistoric Cultural Resources of Snohomish County, Washington	1334282	Overview	Overview of Area
1998	Demuth	Technical Report: Historic, Cultural, and Archaeological Resources Assessment for Everett-to-Seattle Commuter Rail Project Environmental Impact Statement	1340269	Overview	Overview of Area
2000	Johnson	Letter to Molly Adolfson Regarding Proposed California Street Overpass, Everett	1344193	Survey Report	Within project area
2006	Juell	Archaeological Site Assessment of Sound Transit's Sounder: Everett to Seattle Commuter Rail System, King and Snohomish Counties	1348189	Survey Report	0.38 mile south
2008	Hartmann	Cultural Resources Assessment for the Swift Bus Rapid Transit Project	1351380	Survey Report	0.54 mile southeast
2011	Lenz et al.	Cultural Resources Assessment for the Broadway Bridge Replacement Project, Everett	1682948	Survey Report	0.68 mile west
2013	Pinyerd	Downtown Everett #SE03XC527 1602 Hewitt Ave., Everett	1683379	Historic Structures Survey Report	0.37 mile southeast
2013	Rinck	Cultural Resources Monitoring and Discovery Plan for the Kimberly-Clark Worldwide Site Upland Area, Everett	NA	Monitoring and Discovery Plan	0.11 mile north
2013	Rinck et al.	Archaeological Resources Assessment for the Kimberly-Clark Worldwide Site Upland Area, Everett	NA	Survey Report	0.06 mile north

Table 3. Cultural Resources Investigations within 1.0 Mile of the project area (n = 15).

Year	Author	Report Title	NADB Number	Report Type	Location Relative to project area
2014	Udem et al.	Letter to Steve Germiot RE: Results of Cultural Resources Monitoring at the Kimberly-Clark Worldwide Site Upland Area, Everett	1685767	Monitoring Report	0.11 mile north
2014	Sackett	Architectural Survey and Evaluation: Naval Station Everett	1685545	Historic Structures Survey Report	0.47 mile west
2020	Johnson	FINAL Results of Archaeological Monitoring for the Kimberly-Clark Everett Interim Action	1694736	Monitoring Report	0.07 mile north

In 2000, Paragon Research Associates conducted a survey for roadway connector alternatives between Everett Ave that would impact “Maggie’s Park” (Johnson 2000). Maggie’s Park, located approximately 400 feet east of the project area, is located within the Brigham land claim and possibly near the location of the original cabin. However, no archaeological materials have been identified to confirm this claim. Johnson conducted a pedestrian survey and identified no cultural materials.

In 2013, SWCA Environmental Consultants (SWCA) conducted an extensive study and background review for the Kimberly-Clark Worldwide Site Upland Area SEPA process (Rinck et al. 2013). This project area is located within 56 acres of upland lands and 12 acres of tidelands within the north parcel immediately adjacent to the current project area. Previously, this area was utilized as for industrial purposes which has contaminated the area. The first mill within this project area was the Robinson ad Company Mill, which began operations in the early 1890s. By 1901, this area contained an extensive sawmill and planning facility for the Clark-Nickerson Lumber Company. During the background review, SWCA identified the project area as containing a high potential for precontact and historical cultural materials within the natural Port Gardner shoreline. In response to the potential for buried archaeological materials, SWCA developed a site-specific Monitoring and Discovery Plan (MDP) (Rinck 2013).

SWCA performed archaeological monitoring for cleanup excavations at the Kimberly-Clark Worldwide Site Upland Area (Udem et al. 2014). Within one area, excavations intersected natural sediments underlying historic-period fill. Within Location 11, archaeologists observed miscellaneous historic debris and architectural remnants located between 2 and 6 feet below ground surface. One precontact artifact was documented during monitoring—45SN00629, an edge-altered basalt cobble (Udem 2014).

Archaeological monitoring continued at the Kimberly-Clark Worldwide Site Upland Area in 2020 (Johnson 2020). Archaeologists observed architectural and structural debris within the historic fill layer, likely associated with historical mill operations. No precontact materials or intact sediment layers were observed.

3.1.2 Archaeological Resources

One archaeological resource is recorded within a 1.0-mile (1.6-km) radius of the project area. The archaeological resource (45SN00629) is a precontact isolated find identified within historic dredge material underneath a parking lot (Udem 2014; Udem et al. 2014). Historically, the property was the location of a mill situated at 2600 Federal Avenue (Boswell and Sharley 2012). The single lithic artifact was recorded as an edge-altered basalt cobble with 13 multidirectional flake scars on one end. The artifact was donated to the Hibulb Cultural Center (Johnson 2020).

3.1.3 Built Environment

No historic properties listed in the NRHP, WHR, and/or ERHP are located within or immediately adjacent to the project area. Twelve properties listed in the NRHP are located within 1.0 mile (1.6 km) of the project area (Table 4). Additionally, two historic districts are located within 0.5 mile (0.8 km) of the project area: Hewitt Ave Historic District (45DT00231) and Rucker Hill Historic District (45DT00155). Four properties are listed in the WHR. Twenty-seven properties are listed on the ERHP, and all three Everett historic overlay districts begin within one mile of the site. Several properties are listed on more than one register. The dates of significance for the historic properties range from 1892 to 1967. There are no properties listed on the Snohomish County Register of Historic Places within one mile of the project area.

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Roland & Nina Hartley House/Hartley Mansion (45SN00337)	2320 Rucker Ave	1910	Listing No. 86000958; Resource ID 676163 WHR, NRHP	Lambert	1986	0.37 mile northeast
Everett High School (45SN00351)	2400 Colby Ave	1910	Listing No. 97000493; Resource ID 676177 WHR, NRHP	Ravetz	1996	0.35 mile northeast
Everett Public Library (45SN00341)	2702 Hoyt Ave	1934	Resource ID 676167 WHR	Dilgard	1989a	0.27 mile east
Knights of Columbus Community Center and War Memorial Building (45SN00132)	1611 Everett Ave	1921	Listing No. 79002554; Resource ID 676151 WHR, NRHP	Potter	1975c	0.40 mile east
Pioneer Block – Everett (45SN00127)	2814-2816 Rucker	1892	Resource ID 676145 WHR	Lambert	1979	0.23 mile southeast
Marion Building, Hotel Marion, Tontine Saloon (45SN00128)	1401 Hewitt Ave	1895	Resource ID 676146 WHR	Dilgard	1979	0.27 mile southeast
Everett Theatre (45SN00115)	2911 Colby Ave	1901; 1924	Resource ID 676133 WHR	Potter	1975a	0.41 mile southeast
Monte Cristo Hotel (45SN00117)	1507 Wall Street	1925	Listing No. 76001907; Resource ID 676135 WHR, NRHP	Potter	1975b	0.39 mile southeast

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
U.S. Post Office and Customs House (45SN00135)	3006 Colby Ave	1917	Listing No. 76001909; Resource ID 676154 WHR, NRHP	Potter	1975d	0.43 mile southeast
Everett City Hall (45SN00344)	3002 Wetmore Ave	1929	Listing No. 90000674; Resource ID 676170 WHR, NRHP	Dilgard	1989b	0.48 mile southeast
Snohomish County Courthouse (45SN00116)	3000 Rockefeller Ave	1910; 1967	Listing No. 75001870; Resource ID 676134 WHR, NRHP	Potter	1975e	0.56 mile southeast
Everett Carnegie Library/Cassidy Funeral Home (45SN00133)	3001 Oakes Ave	1904; 1905	Listing No. 75001868; Resource ID 676152 WHR, NRHP	Potter	1975f	0.62 mile southeast
Commerce Building (45SN00345)	1801 Hewitt Ave	1910	Listing No. 92001290; Resource ID 676171 ERHP, WHR, NRHP	Sullivan	1992	0.52 mile east
Everett Fire Station No. 2 (45SN00342)	2801 Oakes Ave	1925	Listing No. 90000673; Resource ID 676168 WHR, NRHP	Dilgard	1989c	0.57 mile east
Rucker House (45SN00134)	412 Laurel Dr	1901	Listing No. 75001869; Resource ID 676153 WHR, NRHP	Potter	1975g	0.62 mile southwest
Hewitt Avenue Historic District (45DT00231)	1620 - 1915 Hewitt Avenue and portions of Wetmore, Rockefeller, Oakes, and Lombard Avenues	1894–1959	Listing No. 10001020; Resource ID 674762 WHR, NRHP	Fürész	2010	0.44 mile east
Rucker Hill Historic District (45DT00155)	Laurel, Snohomish, Niles, Warren, Bell, Tulalip, 33rd and 34th	1905–1930	Listing No. 89000399; Resource ID 674698 WHR, NRHP	Ravetz	1988	0.45 mile southwest

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Rucker-Grand Historic Overlay Zone	Rucker and Grand Avenues between 10th and 24th Streets		N/A ERHP			0.37 mile northeast
Norton-Grand Historic Overlay District	Norton and Grand Avenues between Pacific Avenue and 3612 Norton Avenue		N/A ERHP			0.34 mile south
Riverside Historic Overlay District	N/A	Established 2008	N/A ERHP			0.88 mile east
Fratt Mansion (45SN00680)	1725 Grand Ave	1904	Listing No. 100000991 Resource ID 678273 ERHP, WHR, NRHP	Cope & Gillette	2017	0.91 mile northeast
Sittig House	1927 Rucker Ave	1893	N/A ERHP	O'Donnell	2018	0.75 mile northeast
Cleaver Clough House	2031 Grand Ave	1907	N/A ERHP			0.64 mile northeast
Hilzinger House	2108 Rucker Ave	1907	N/A ERHP			0.63 mile northeast
Wright House	2112 Rucker Ave	1905	N/A ERHP			0.61 mile northeast
Blackman House	2208 Rucker Ave	1910	N/A ERHP			0.54 mile northeast
Austin House	2201 Rucker Ave	1897-1900	N/A ERHP			0.57 mile northeast
Agnew House	2301 Rucker Ave	1899	N/A ERHP			0.49 mile northeast
Krieger Laundry	2808 Hoyt Ave	1915	N/A ERHP			0.3 mile southeast
Walsh Platt/Fisher Motors Building	2902 Rucker Ave	1930	N/A ERHP			0.27 mile southeast
Everett Downtown Storage	3001 Rucker Ave	1919	N/A ERHP			0.36 mile southeast
Howard House	3410 Snohomish Ave	1912	N/A ERHP			0.69 mile southwest
Jackson House	3602 Oakes Ave	1906	N/A ERHP			0.97 mile southeast
Culmback Building	3013 Colby Ave	1924	N/A ERHP			0.48 mile southeast

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (*n* = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Port Gardner Building	2802 Wetmore Ave	1929	N/A ERHP			0.43 mile east
Bank of Everett (Cope Gillette Theatre)	2703 Wetmore Ave	1963	N/A ERHP			0.44 mile east
Challacombe & Fickel Building	2727 Oakes Ave	1923	N/A ERHP			0.59 mile east
Evergreen Building	1909 Hewitt Ave	1902	N/A ERHP			0.62 mile southeast
Watson's Bakery	1812 Hewitt Ave	1910	N/A ERHP			0.57 mile southeast
Morrow Building	2823 Rockefeller Ave	1925	N/A ERHP			0.54 mile southeast
Van Valey House	2130 Colby Ave	1914	N/A ERHP			0.64 mile northeast
Sahlinger-Muck	2319 Colby Ave	1908	N/A ERHP			0.56 mile northeast
Clark Park	2400 Lombard Ave	1894	N/A ERHP			0.66 mile northeast
Ray Fosheim House	2017 26 th St	1892	N/A ERHP			0.7 mile northeast
Lettelier House	2510 Baker Ave	1908	N/A ERHP			0.98 mile northeast

Three historic properties located within 0.5 mile (0.8 km) of the project area have been recommended and determined eligible for listing in the NRHP and/or WHR (Table 5). The Kimberly-Clark Everett Mill Main Office (Property ID 667716) is within 0.09 miles of the project area. The building was originally constructed in 1929 and consisted of a two-story Neoclassical rectangular structure with red brick cladding and low-pitched hipped roof. The building has a projecting Classical portico and round, white-painted Tuscan columns. In the 1940s and 1950s, the building underwent several alterations including the addition of two dormers on the roof, an addition to the south elevation of the building, the addition of a poured concrete deck and steps, and window replacements. The building is recommended as eligible for listing in the NRHP under Criterion A and listing in the WHR based on its historical association with the industrial development of Everett (Sharley 2012). All other listed and eligible properties are separated from the project area by the BNSF Railway train tracks. Most listed properties within one mile of the project area are clustered in areas to the east and to the north-northeast.

Table 5. Properties Recommended Eligible Located within 0.5 Mile of project area (n = 3)

Property Name	Address	Date Built	Property ID/ Resource ID	Author	Year	Location Relative to project area
Kimberly-Clark Everett Mill Main Office	2600 Federal Ave	1929	Property ID 667716; Resource ID 614724	Sharley	2012	0.09 mile north
Daulph Delicatessen	1416 Hewitt Ave	1927	Property ID 18268; Resource ID 12597	Dilgard and Riddle	1989	0.33 mile east
Everett Main Post Office	3102 Hoyt Ave	1964	Property ID 270916	Richards	2014	0.44 mile southeast

3.1.4 Cemeteries and Burials

According to information provided on the DAHP’s WISAARD, there are no historic or precontact burials located within 1.0 mile (1.6 km) of the project area. One historic columbarium is located approximately 0.47-mile northeast of the project area (DAHP 2009). The Trinity Episcopal Church Columbarium (45SN00555) is situated at 2301 Hoyt Ave. The church was dedicated in 1921 with a new parish hall constructed in 1961 (Trinity Episcopal Church 2019). No further information is provided regarding the columbarium.

3.2 Cultural Resources Summary

Archival research indicates a high level of human activity took place adjacent to the project area during precontact and historic times. Given the history of the project area and its immediate vicinity, Cardno concludes that the potential for encountering subsurface archaeological deposits beneath the historic fill layers is moderate to high. Historical land modification, including the introduction of artificial fill and development, reduces the likelihood of encountering in situ precontact artifacts. Ethnographic-period archaeological deposits within and adjacent to the project area may include disturbed or redeposited midden deposits, burials, evidence of a village, or debris associated with short-term occupations and resource-processing locations. Historic-period deposits may include debris from agricultural and historic homestead structures and other early-twentieth-century structure (i.e., “squatters shacks”), or from manufacturing or commercial development.

4.0 Recommendations

Cardno recommends that a monitoring and inadvertent discovery plan (MIDP) be implemented to minimize potential impacts to any currently unknown intact archaeological resources. Monitoring should not be necessary in glacial deposits and sediments, nor in existing areas where disturbance has already occurred.

Cardno recommends that the MIDP outline the necessary steps to be taken by contractors in the event of an inadvertent discovery during construction. These steps would serve to minimize damage to any inadvertently discovered archaeological resources during ground-disturbing activities, which may include small, deeply buried, and/or widely dispersed historic or precontact cultural materials (e.g., railroad grade, rails, ties, stakes, and footings; glass bottles; sanitary cans; chipped-stone tools; ground stone; beads; shell; faunal remains; human remains; funerary objects; and objects of cultural patrimony).

Steps included in the MIDP would outline the applicable local laws and regulations, stop-work and notification protocols, discovery protection measures, procedures for assessment by archaeologists, and steps for consultation with the DAHP and any affected Indian tribes. In the state of Washington, archaeological sites are protected from knowing disturbance on both public and private lands. As described in Section 2, RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the DAHP before excavating, removing, or altering Native American human remains or archaeological resources in Washington. A failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090.

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About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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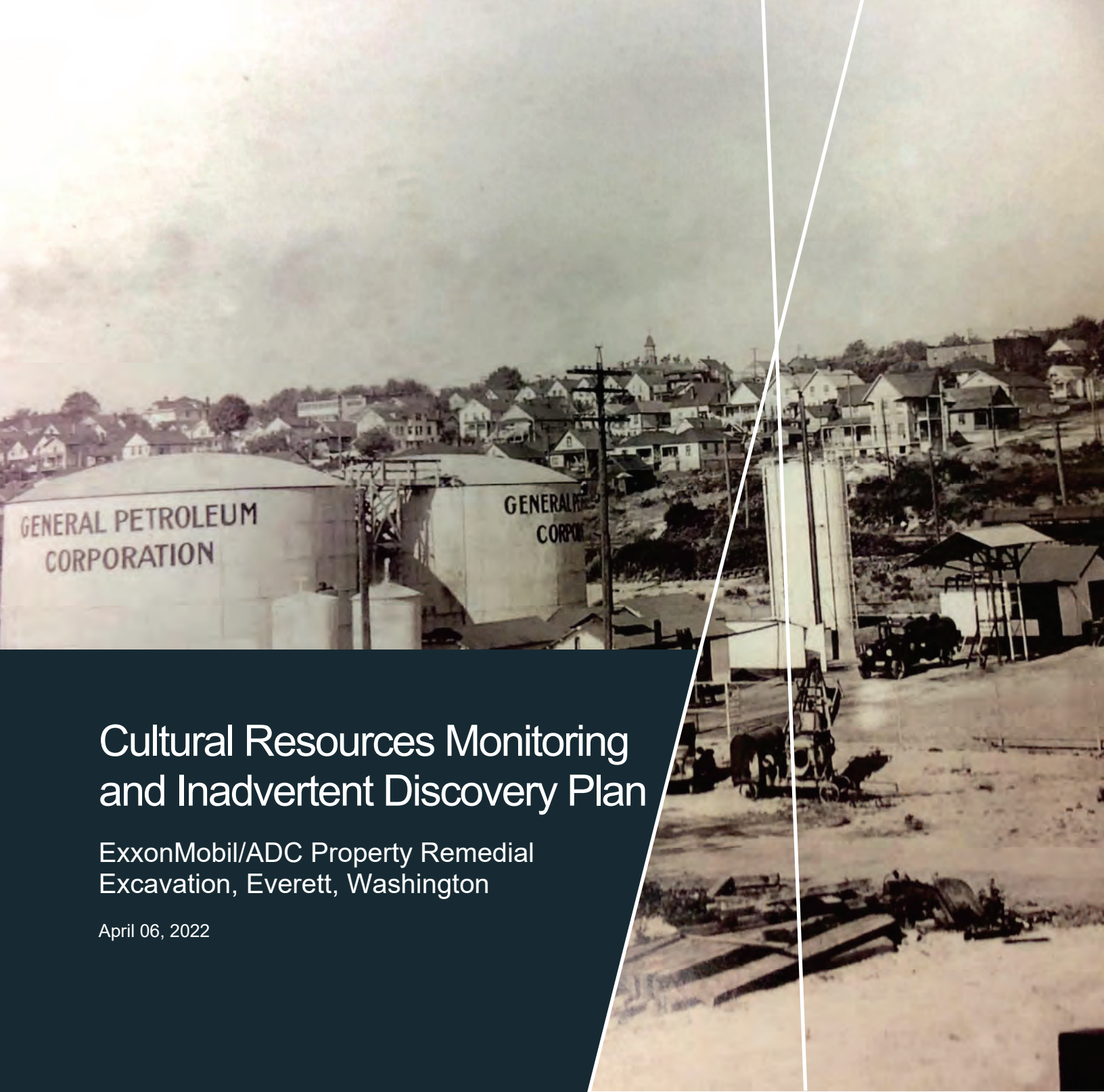
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HARM**
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

APPENDIX F

***Cardno's Cultural Resources Monitoring and Inadvertent
Discovery Plan, dated April 6, 2022***





Cultural Resources Monitoring and Inadvertent Discovery Plan

ExxonMobil/ADC Property Remedial
Excavation, Everett, Washington

April 06, 2022

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Project Name Cultural Resources Monitoring and
Inadvertent Discovery Plan
ExxonMobil/ADC Property Remedial
Excavation, Everett, Washington

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Date April 6, 2022

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Cover image: PSI Cleanup Sites - Port Gardner, Sound Living Conference presentation, October 25, 2014. Page 20.
<https://ecology.wa.gov/DOE/files/02/02f2d202-9008-4049-ac30-63bc8c63f32d.pdf>

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Introduction

The proposed cleanup project by the ExxonMobil/ American Distributing Company (ADC) in Everett, Washington, is listed by the Washington State Department of Ecology (Ecology) as Cleanup Site 5182. Historical releases of petroleum products have been documented within the project area due to former operations of bulk petroleum storage, transfer, and distribution facilities and operations of other similar companies on nearby parcels. The purpose of the project is to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation. Proposed cleanup activities include installation of shoring walls, and excavation of impacted soils. Following excavation of contaminated soils, the project area will be backfilled, re-graded to preexisting contours, removal of shoring walls, and repaved.

Cardno, Inc. (Cardno) previously prepared a cultural resources assessment in support of the project (Scott et al. 2021). The assessment consisted of a literature review and records search within 1.0 mile (1.6 kilometer [km]) of the project area that included cultural resource records for previously recorded historic, ethnohistoric, and precontact archaeological and built environment resources; a review of any local, state, and national register nomination forms; a review of previously conducted cultural resources investigations; and a review of any known or potential Traditional Cultural Properties (TCPs). This monitoring and inadvertent discovery plan (MIDP) was developed to use during cleanup operations.

Project Location and Description

The project is in Section 19 of Township 29 North, Range 5 East, Willamette Meridian (Figure 1). The ExxonMobil/ADC property consists of 3.48 acres. The acres are comprised of several tax parcels and portions of the City of Everett's (City) Right-of-Way (ROW). Parcel information is provided below (Table 1; Figure 2). Currently, the project area consists of a paved parking lot with no extant structures or buildings.

Regulatory Setting

The Washington State Environmental Policy Act (SEPA; RCW 43.21C) and its implementing rules contained in Washington Administrative Code (WAC) 197-11 require applicants to identify and document cultural and historical places and objects if national, state, or local significance that may be affected by project activities. The regulation requires proposed methods to reduce or control impacts to identified cultural resources during project activities. The SEPA review process provides notice to all affected tribal, state, and private entities.

Precontact and historic archaeological sites are protected by several Washington state regulations on both public and private lands. Revised Code of Washington (RCW) 27.44 and RCW 27.53.060 require that a person obtain a permit from the Washington Department of Archaeology and Historic Preservation (DAHP) before excavating, removing, or altering Native American human remains or archaeological resources in Washington. A failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090. The complete requirements for filing an archaeological excavation permit can be found in WAC 25-48-060. In the state of Washington, permits are required for alterations (e.g., excavation, removal, and collection of archaeological materials) at all precontact archaeological sites and at historic archaeological sites that are eligible for or listed in the National Register of Historic Places (NRHP).

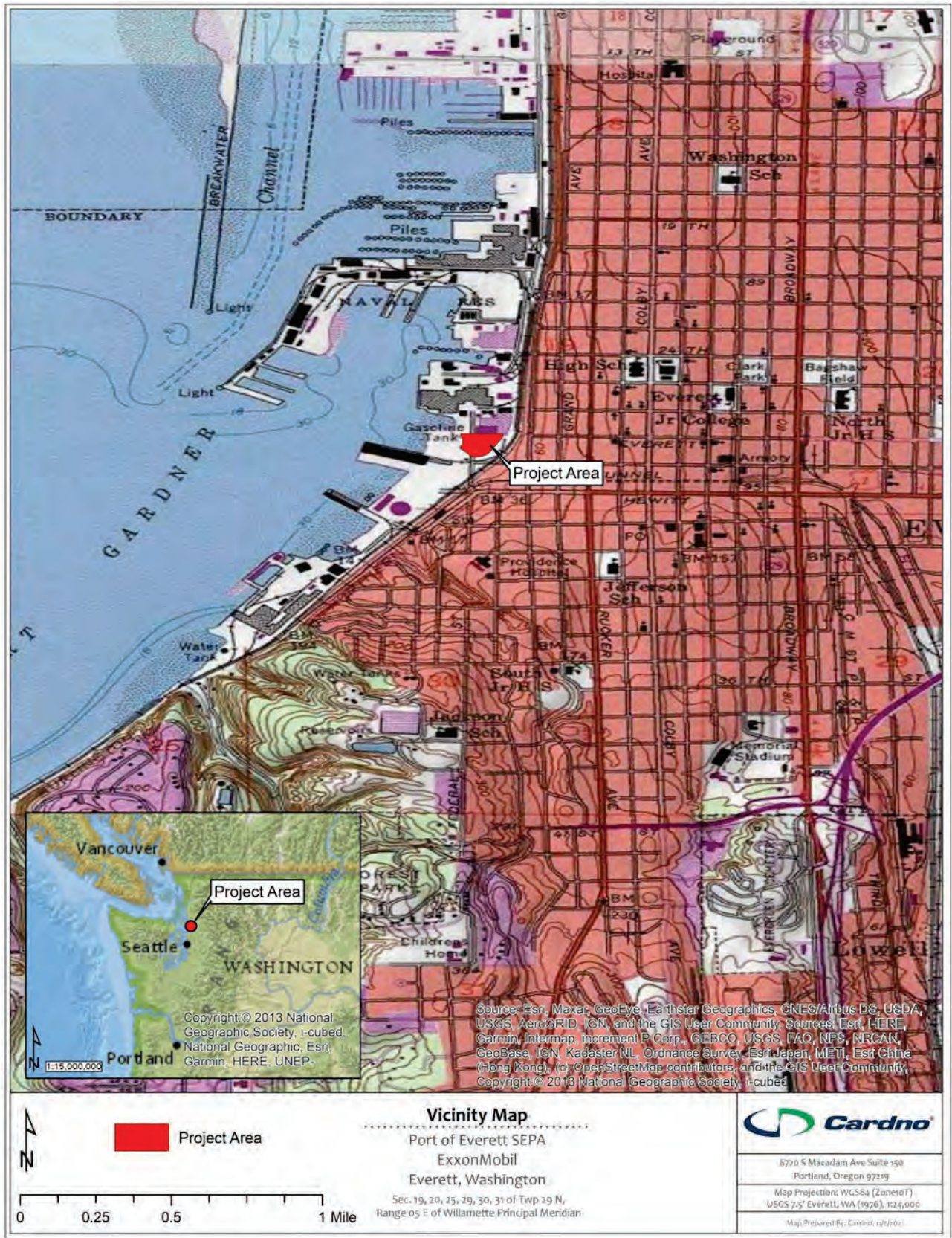


Figure 1. Project area and vicinity.

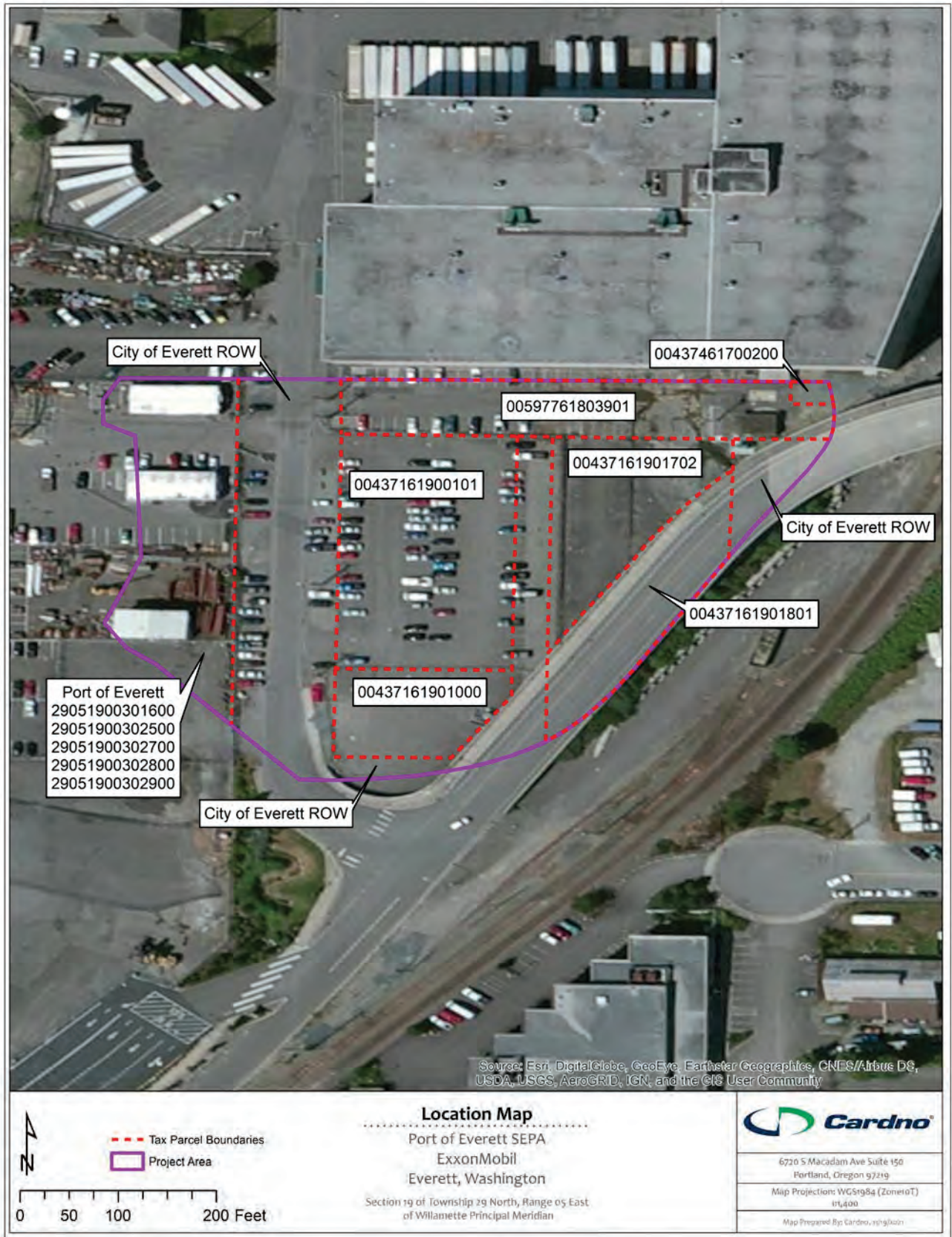


Figure 2. The project area denoting impacted Snohomish County tax parcels and City ROW.

Table 1. Snohomish County Tax Parcel Information.

Owners	Parcel Number(s)
Burlington Northern Railroad	00437161901702
City of Everett	00437161901801
Miller Trust (Cecilia Beverly Miller, beneficiary)	00437161900101
Mobil Oil Corporation	00437161901000
Port of Everett	00437461700200, 00597761803901, 29051900301600, 29051900302500, 29051900302700, 29051900302800, 29051900302900

If a person(s) violates this statute and knowingly disturbs or alters an archaeological site, the DAHP is allowed to issue civil penalties of up to \$5,000, in addition to site restoration costs and investigative costs per RCW 27.53.095. Restorative and monetary remedies do not prevent concerned Indian tribes from undertaking civil action in state or federal court or law enforcement agencies from undertaking criminal investigation or prosecution. If human remains and/or burials are disturbed, RCW 27.44.050 allows an affected Indian Tribe to undertake civil action. Additionally, the excavation of human remains without a permit is a felony. RCW 68.60 requires “expeditious” notification of local law enforcement and the coroner if skeletal human remains are discovered. Failure to notify is considered a misdemeanor.

Snohomish County Code (SCC) 30.67.340 requires developers and property owners to immediately stop work and notify the county, DAHP, and affected Indian tribes if archaeological resources are uncovered during excavation. It further stipulates that county permits issued in areas documented as containing archaeological resources require a site inspection or evaluation by a professional archaeologist in coordination with affected Indian tribes. SCC 20.32D.070-100 outlines the process for obtaining and working under a certificate of appropriateness, and zoning. SCC 20.32D.200 requires recordation of archaeological sites. Additionally, completion of an archaeological report or relocation of a project is required for any construction, earth movement, clearing, or other site disturbance of a known archaeological site or any development application proposed on non-tribally owned, fee-simple properties designated Reservation Commercial on the Snohomish County Future Land Use Map. SCC 20.32D.220 outlines the process to follow if human remains or archaeological resources are found during construction, earth movement, clearing, or other site disturbance.

Everett Municipal Code (EMC) 19.28 outlines the process for identifying, listing, and protecting resources on the Everett Register of Historic Places and within historic overlay zones. Properties within historic overlay zones are governed by EMC 19.28.020 through 19.28.120. Criteria for placement on the Everett Register of Historic Places are described in EMC 19.28.130. Proposed changes to properties on the Everett Register are reviewed by the Everett historical commission per 19.28.140.

Potential for Discovery of Cultural Resources

Archival research indicates a high level of human activity took place adjacent to the project area during precontact and historic times (Scott et al. 2021). Given the history of the project area and its immediate vicinity, Cardno concludes that the potential for encountering subsurface archaeological deposits beneath the historic fill layers is moderate to high. Historical land modification, including the introduction of artificial fill and development, reduces the likelihood of encountering in situ precontact artifacts. Ethnographic-

period archaeological deposits within and adjacent to the project area may include disturbed or redeposited midden deposits, burials, evidence of a village, or debris associated with short-term occupations and resource-processing locations. Historic-period deposits may include debris from agricultural and historic homestead structures and other early-twentieth-century structure (i.e., “squatters shacks”), or from manufacturing or commercial development.

Cardno archaeologists conducted a background search and literature review of existing cultural resource records; local, state, and national register nomination forms; previous cultural resources investigations; and any known or potential TCPs in and within 1.0 mile (1.6 km) of the project area. According to the DAHP’s predictive model available on the WISAARD online database, there is a very high risk of encountering buried precontact archaeological deposits in the project area. Previous archaeological construction monitoring conducted between 2013 and 2020 suggest a high potential for buried intact cultural deposits.

In 2013, SWCA Environmental Consultants (SWCA) conducted an extensive study and background review for the Kimberly-Clark Worldwide Site Upland Area SEPA process (Rinck et al. 2013). This project area is immediately adjacent to the current project area. Previously, this area was utilized as for industrial purposes which has contaminated the area. During the background review, SWCA identified the project area as containing a high potential for precontact and historical cultural materials within the natural Port Gardner shoreline. In response to the potential for buried archaeological materials, SWCA developed a site-specific Monitoring and Discovery Plan (MDP) (Rinck 2013). SWCA performed archaeological monitoring for cleanup excavations at the Kimberly-Clark Worldwide Site Upland Area (Undem et al. 2014). Within one cleanup area, excavations intersected natural sediments underlying historic-period fill. Within Location 11, archaeologists observed miscellaneous historic debris and architectural remnants located between 2 and 6 feet below ground surface. One precontact artifact was documented during monitoring—45SN00629, an edge-altered basalt cobble (Undem 2014). Archaeological monitoring continued at the Kimberly-Clark Worldwide Site Upland Area in 2020 (Johnson 2020). Archaeologists observed architectural and structural debris within the historic fill layer, likely associated with historical mill operations. No precontact materials or intact sediment layers were observed.

No documented historic properties listed in the NRHP, Washington Heritage Register (WHR), and/or Everett Register of Historic Places (ERHP) are within or adjacent to the project area. There are three historic properties within 0.5 mile (0.8 km) of the project area have been recommended and determined eligible for listing in the NRHP and/or WHR including the Kimberly-Clark Everett Mill Main Office (Property ID 667716), the Daulph Delicatessen (Property ID 18268), and the Everett Main Post Office (Property ID 270916). All other listed and eligible properties are separated from the project area by the BNSF Railway Company train tracks.

Monitoring Measures

Cardno recommends that this MIDP be implemented to minimize potential impacts to any currently unknown intact archaeological resources. Monitoring should not be necessary in glacial deposits and sediments, nor in existing areas where disturbance has already occurred. The following outlines procedures to follow and the responsibilities of Cardno, ExxonMobil/ADC, and the contractor during construction.

Preconstruction Meeting

Prior to construction activities, an archaeologist familiar with the project will meet with the construction supervisors and project personnel. The objective is to review the area to be monitored, and to go over the procedures for coordination and notification of discoveries. Communication is critical to the success of the

MIDP and ensures that a monitor is present when needed. The roles and responsibilities of the monitor and other project personnel need to be outlined prior to construction. These include:

1. Review of all communication protocols. A list of contacts is at the end of this MIDP. When additions or changes in contacts are made, a revised contact list will be prepared at that time.
2. The responsibilities of each party will be reviewed, and each party identified including the contractor, ExxonMobil/ADC, Cardno, agencies, and Tribes.
3. Scheduling procedures for archaeological monitors will be outlined. The individual who will be responsible for making the initial request, and the period of advance notice to be given, will be agreed upon by ExxonMobil/ADC, Cardno, and the contractor.
4. On-site safety procedures will be reviewed.

Monitoring During Construction

An archaeologist will perform on-site monitoring of initial ground-disturbing activities to a depth of approximately 7 ft (2.13 m) below ground surface (bgs) because historic debris and architectural remnants were located between 2 and 6 ft bgs in an adjacent property in 2014 (Undem et al. 2014).

- Ground disturbance occurs when the surface is traversed or cut and may consist of excavation, trenching, potholing, grading, blading, grubbing, leveling, vehicular traffic that treads into the surface (as during wet weather), and hand-digging with a shovel. This list is not considered exhaustive, and essentially anytime possible native soil may be displaced it will be considered to be ground disturbance.
- If formed tools, concentrations, or features are observed during monitoring, construction work will be briefly halted so that the artifacts can be documented, photographed, and mapped in-place, if possible, using a Global Positioning System (GPS) unit. It is anticipated that the archaeological monitor will not collect artifacts or samples unless it is determined that they represent evidence of significant archaeological deposits or a feature, or the artifact is a formed tool.
- If burial features, artifacts, or human bone are encountered within the work area, Cardno has the authority to stop work and notify the construction manager, Exxon Mobile/ADC, and DAHP. The procedures to be followed in the event of an inadvertent discovery that may need additional excavation or protection are outlined in a section below.

Report of Monitoring Activities

A technical memo report of the archaeological monitoring will be prepared following the completion of the project. The report will include information about the monitoring activities and documentation of artifacts or new archaeological resources, if found during construction, and will include maps and photographs. In addition, inadvertent discoveries will be described in the report, if encountered. If artifacts are collected, a catalog will be provided, and a summary prepared as part of the report. Within 90 days of the conclusion of fieldwork, the report will be submitted to Exxon Mobile/ADC, DAHP, and the Tribes.

Summary of Monitoring Measures

ExxonMobil/ADC will ensure that the outlined procedures are followed during construction:

1. An on-site meeting prior to construction will take place between Cardno, the construction inspectors and supervisors, and the developer's representatives, to review specific archaeological resource monitoring procedures and responsibilities. All site safety will be reviewed at this time.

2. On-site archaeological monitoring of initial ground-disturbing activities to a depth of approximately 7 ft (2.13 m) bgs will occur across the project area.
3. Construction activities will be halted if the activity encounters, or may impact, artifact concentrations, features, human remains (or potential human remains), funerary items, or sacred objects. Construction work would not resume until the consulting parties agree on a course of action based on the inadvertent discovery protocol as described in the following section.
4. Cardno will prepare a report summarizing the activities that were monitored, and noting inadvertent discoveries and steps taken in response to a discovery, as outlined in this MIDP. The report will be submitted to Exxon Mobile/ADC, DAHP, and the Tribes.

Inadvertent Discovery Protocol

The following outlines procedures to follow, in accordance with state laws, if certain archaeological materials and human remains are discovered in the project area, during construction. In the event of an inadvertent discovery such as intact archaeological features or human remains, the following steps will be taken.

Archaeological Resources Prompting Inadvertent Discovery Protocol

Archaeological resources, such as pre-contact (Native American) or historic-period artifacts or features, could be inadvertently discovered during construction. Work must stop when the following types of artifacts and/or features are encountered (the list is not exhaustive):

- Flaked stone tools (e.g., arrowheads, knives, scrapers) and debitage.
- Groundstone tools (e.g., mortars, pestles).
- Layers (strata) of discolored earth resulting from fire hearths or other features. May be black, red, or mottled brown and may contain discolored cracked rocks, charcoal, or dark soil.
- An area of charcoal or very dark stained soil with artifacts.
- An accumulation of shell, burned rocks, or other food-related materials.
- Animal bones, including small pieces of bone.
- Personal items, funerary materials, and mortuary objects.
- Structural remains (e.g., wooden beams, post holes).

When in doubt, assume the material is a cultural resource. Even what looks to be old garbage could be an archaeological resource.

On-site Responsibilities

If an inadvertent discovery is encountered during construction the following steps must be followed:

1. **STOP WORK:** If any Exxon Mobil/ADC employee, contractor, or subcontractor believes that he or she has uncovered an archaeological resource or evidence of a burial at any point in the project, all work adjacent to the discovery must stop. The discovery location should not be left unsecured at any time.
2. **NOTIFY CARDNO:** Notify the on-site archaeological monitor and the primary Cardno contact and follow the provisions in the MIDP to verify the discovery (contact list below).

3. NOTIFY EXXONMOBILE/ADC: Notify the Exxon Mobile/ADC project manager immediately (contact list below).
4. CARDNO WILL NOTIFY DAHP AND THE TRIBES, ON BEHALF OF EXXONMOBILE/ADC.

Responsibilities of Exxon Mobile/ADC:

1. PROTECT: Exxon Mobile/ADC is responsible for taking appropriate steps to protect the discovery site.
 - a. All work will stop in an area adequate to provide for the total security, protection, and integrity of the resource, typically within 30 meters (100 feet). Vehicles, equipment, and unauthorized personnel will not be permitted to traverse the discovery vicinity. Work in the immediate area will not resume until treatment of the discovery has been completed following provisions for treating archaeological materials as set forth in this document.
 - b. Exxon Mobile/ADC may allow construction away from archaeological resources, in other areas, prior to contacting the concerned parties.
 - c. Until assessed by Cardno, treat all bone and bone fragments as possible human remains. If human remains, bone, or bone fragments are encountered, treat them with dignity and respect at all times. Cover the remains with a tarp or other materials (not soil or rocks) for temporary protection in place and to shield them from being photographed. Do not call 911 or speak with the media.
2. CONTACT: If Cardno has not been contacted, Exxon Mobile/ADC will be responsible for doing so (contact list below).

Responsibilities of Archaeologist:

1. MONITOR: An archaeological monitor is required to be on-site ground-disturbing activities to a depth of approximately 7 ft (2.13 m) bgs.
2. IDENTIFY: The archaeologist will examine the inadvertent discovery to determine if it is archaeological or to verify remains are human.
 - a. If the find is determined not archaeological, work may proceed with no further delay.
 - b. If the find is determined to be archaeological, the archaeologist will continue with notification (see archaeological procedure below).
 - c. If the find may be human remains or funerary objects, the archaeologist will ensure that a qualified individual examines the find.
 - d. If it is determined that the remains are human, the procedure described in the following section will be followed.
3. NOTIFY: Notify DAHP (contact list below).
 - a. If the discovery may relate to Native American interests, Cardno will also contact the Tribal representatives (contact list below).

Archaeological Procedures:

Pre-contact or historic-period archaeological material discovered inadvertently during project construction will be recorded, and Cardno will complete the documentation and assessment. Discovered features and formed tools will be photographed; stratigraphic profiles and soil/sediment descriptions of the newly discovered subsurface features will be prepared. Discovery locations will be documented on scaled site plans and site location maps.

Archaeological features and artifacts inadvertently discovered in buried sediments may require further excavation. After coordination on the appropriate procedures with DAHP and Tribes, a unit(s) or small trench(s) may be excavated to determine if an intact occupation surface is present. The controlled excavation of units may assist in gathering information on the nature, extent, and integrity of the subsurface deposits. Archaeological excavation units would be dug by hand in a controlled fashion to expose the feature, collect samples from undisturbed contexts, or assist in interpreting complex stratigraphy. Spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of archaeological material, and depth to sterile soil, or bedrock will be recorded for each excavation unit on a standard form. Unit-level forms will be used, which include plan maps for each excavated level, and material type, number, and vertical provenience (depth below surface and stratum association where applicable) for all subsurface artifacts and discovered features. All of the sediments from archaeological excavation units, for the purposes of additional investigations of newly discovered archaeological deposits or features, will be screened through 6.4-mm (¼-in) mesh.

All pre-contact formed tools collected from the subsurface excavation units will be analyzed, cataloged, and temporarily curated. Archaeological materials (with the exception of human remains, funerary items, and sacred objects) and copies of records will be curated at the Burke Museum in Seattle, Washington.

If assessment activity exposes human remains (e.g., burials, isolated teeth, or bones), the process described in the previous sections will be followed. The discovery will then be under the authority of DAHP.

Special Procedures for the Discovery of Human Remains

Any human remains or funerary objects will be treated with dignity and respect at all times. If an inadvertent discovery of human remains or funerary objects occurs during construction the following steps must be followed:

1. Notify the Snohomish County Medical Examiner's Office and Snohomish County Sheriff's Office (contact list below).
 - a. The Medical Examiner has the responsibility to determine if the remains are "forensic" and under the medical examiner's jurisdiction or are "non-forensic."
 - b. If the remains are determined to be "non-forensic," the Medical Examiner will notify DAHP. DAHP's physical anthropologist will examine the remains and notify affected Native American Indian Tribes of the results of the examination. The final disposition of the remains will be determined after consulting with the appropriate Tribal representatives, and others.
2. Participate in Consultation: Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Exxon Mobile/ADC personnel will participate in consultation.
3. Project construction outside the discovery location may continue while documentation and assessment of the feature proceeds. After Cardno verifies the boundaries of the discovery location, Cardno will determine the appropriate level of documentation and treatment of the resource, in consultation with Exxon Mobile/ADC, DAHP, and the affected Tribes. Construction may continue at the discovery location only after the process outlined in this MIDP is followed and the DAHP determines that compliance with state and county laws is complete.

Summary of Inadvertent Discovery Protocol

If an inadvertent discovery is encountered during construction the following steps must be followed:

1. All construction activities that may affect possible human remains, a feature, or potentially significant archaeological deposits should be halted, and the remains, archaeological materials, and surrounding soil should not be disturbed. The site will be kept secure from further impacts

and trespass. Construction personnel will notify the archaeological monitor if the monitor is not present at the time of the discovery.

2. If the inadvertent discovery includes human remains, bones, or materials possibly representing human remains or a burial, all work in that area must stop and Cardno will contact the Snohomish County Medical Examiner's Office and Snohomish County Sheriff's Office (do not call 911). Treat the finds with dignity and shield them from view of personnel. Additional information on procedures for handling discoveries of possible human remains is detailed above.
3. If the medical examiner determines that the remains are "non-forensic," the medical examiner will officially contact DAHP. The DAHP physical anthropologist will confirm whether the remains are Native American or Non-Native American under the law, and will conduct consultation with the Tribes, Exxon Mobile/ADC, and others deemed appropriate. Disposition of the remains will be made by DAHP, in consultation with Tribes and others, as appropriate.
4. Cardno will contact DAHP, as well as Exxon Mobil/ADC, if they have not yet been contacted, if there is a discovery that is not related to human remains. The nature of the discovery will be determined and consulting parties (i.e., the Tribes) will be contacted. Security measures will be taken to prevent illicit activities such as looting or vandalism.
5. If evidence of an important deposit or feature is encountered during construction, and no human remains are encountered, a plan to address the impacts will be determined among the consulting parties.

Contact Information

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Snohomish County

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Adam Fortney, Sheriff
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DAHP Tribal Areas of Interest

Muckleshoot Indian Tribe

Jaison Elkins, Tribal Chair
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Stillaguamish Tribe of Indians

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Swinomish Indian Tribal Community

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Tulalip Tribes

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Tulalip, WA 98271
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DAHP Human Remains Consultation – Inadvertent Discovery Tribal Contacts

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Anacortes, WA 98221
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Sauk-Suiattle Indian Tribe

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Confederated Tribes and Bands of the Yakama Nation

Delano Saluskin, Tribal Chair
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Toppenish, WA 98948
Phone: (509)865-5121
Email: Delano_saluskin@yakima.com

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Udem, Cyrena

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About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm

Cardno
**ZERO
HARM**
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field.

Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

APPENDIX G
Stantec's Revised Proposed Remedial Excavation SEPA
Checklist, dated May 30, 2023





**Revised Proposed Remedial
Excavation – SEPA Checklist**

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington

May 30, 2023

Prepared for:

ExxonMobil Environmental and
Property Solutions Company and
American Distributing Company

Prepared by:

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Project: 238000337

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ABBREVIATIONS

ADC	American Distributing Company
bgs	below ground surface
BMPs	Best Management Practices
BNSF	BNSF Railway Company
CAP	Cleanup Action Plan
CFR	Code of Federal Regulations
COCs	contaminants of concerns
CSO	combined sewer outflow
CSTO	California Street Overcrossing
Ecology Site	Ecology recognized ExxonMobil ADC Site
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
Everett	City of Everett
ExxonMobil	ExxonMobil Environmental and Property Solutions
GPR	ground penetrating radar
Kimberly-Clark	Kimberly-Clark Corporation
LNAPL	light non-aqueous phase liquid
MIDP	Monitoring and Inadvertent Discovery Plan
MTCA	Model Toxics Control Act
N/A	Not applicable
Port Property	Port of Everett
Project	ExxonMobil ADC Cleanup Action Plan
RCW	Revised Code of Washington
SOI	Secretary of the Interior
Stantec	Stantec Consulting Services Inc.
SWMMWW	Stormwater Management Manual for Western Washington
UDWP	Urban Deepwater Port
WAC	Washington Administrative Code



A Background

A. Background

1. Name of proposed project, if applicable:

ExxonMobil ADC Cleanup Action Plan (Project)

2. Name of applicant:

ExxonMobil Environmental and Property Solutions (ExxonMobil), American Distributing Company (ADC)

3. Address and phone number of applicant and contact person:

Jeff Johnson
ExxonMobil Environmental and Property Solutions Company
25915 South Frontage Road
Channahon, Illinois 60410
(815) 860-7290

Steve Miller
American Distributing Company
13618 45th Avenue Northeast
Marysville, Washington 98271
(360) 658-375

4. Date checklist prepared:

May 30, 2023

5. Agency requesting checklist:

Washington State Department of Ecology (Ecology)

6. Proposed timing or schedule (including phasing, if applicable):

Phase 1 excavation west of Federal Avenue: August 2022 to March 2023 (completed as part of Interim Action Plan).

Phase 2 excavation east of Federal Avenue: September 2023 to September 2024.

Soil and Groundwater monitoring: ongoing, until cleanup levels are achieved.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

No.



A Background

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Since 1985, various consultants have conducted environmental investigations to characterize the nature and extent of contaminants of concerns (COCs) in soil and groundwater at the Ecology recognized ExxonMobil ADC Site (Ecology Site). The Ecology Site is defined as the ExxonMobil and ADC-owned properties (ExxonMobil ADC Property), located at 2717 and 2731 Federal Avenue, Everett, Washington (Figure 1), and the surrounding rights-of-way and properties, including the Port of Everett (Port Property), located at 2730 Federal Avenue, Everett, Washington. The investigations and reports related to the remedial excavation activities proposed in the draft Cleanup Action Plan (CAP) (submitted to Ecology in July 2023) are provided in Appendix A.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

The remedial excavation and associated cleanup activities are exempt from the procedural requirements of local, state, and federal permits and approvals because they will be performed under a Washington State Model Toxics Control Act (MTCA) Agreed Order.

10. List any government approvals or permits that will be needed for your proposal, if known.

The remedial excavation and associated cleanup activities actions will be conducted under the Agreed Order. Pursuant to Washington Administrative Code (WAC) 173-340-710(9), the Project will comply with the substantive requirements of the following state laws, however it is exempt from their procedural requirements:

- Washington State Clean Air Act (70.94 Revised Code of Washington [RCW])
- Solid Waste Management Act (70.95 RCW)
- Hazardous Waste Management Act (70.105 RCW)
- Construction Projects in State Waters (75.20 RCW)
- Shoreline Management Act (90.58 RCW)
- City of Everett (Everett) laws regarding excavation, shoring, dewatering, and erosion control

The procedural exemption is not applicable if Ecology determines the exemption would result in loss of approval from a federal agency for the agency to administer federal laws.

11. Give a brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Ecology Site boundary is 3.37 acres, encompassing private property to the east of Federal Avenue, and Port Property to the west of Federal Avenue (Figure 2). The Ecology Site consists of a paved parking lot; portions of Federal Avenue, the Terminal Avenue Overpass, and the former Everett Avenue; and portions of Everett Ship Repair and Dunlap Towing. Historical releases of petroleum products have been documented at the Ecology Site



A Background

due to former operation of bulk petroleum storage, transfer, and distribution facilities on the Ecology Site and operations of other companies on nearby parcels. The proposed Project is to cleanup soil and groundwater at the Ecology Site that is impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation.

Proposed cleanup activities include excavation of impacted soils in two areas; on the west side of Federal Avenue on Port Property (completed March 2023), and on the east side of Federal Avenue on ADC, ExxonMobil, and BNSF Railway Company (BNSF) property (the Project Areas, see Figure 3 and Figure 4). Groundwater monitoring of the Ecology Site will also occur. Due to the shallow water table in the Project Area, water management during the excavation, including limited dewatering, may be necessary. Soil will be removed using dredging methodology with a bucket, which will facilitate excavation below the water table and minimize the need for dewatering. Any wastewater generated during dewatering will be treated and discharged to a City of Everett-approved discharge point. Impacted soil will be transported offsite by truck to a permitted landfill facility for final disposal. The soils beneath Federal Avenue will not be excavated, and the street will remain open during cleanup activities.

A low permeability barrier wall will be constructed along the excavation sidewall on the western side of Federal Avenue. The barrier wall will limit LNAPL migration following the remedial excavation on the Port Property. After excavation has been completed, a shoring will be removed, and the area will be backfilled, regraded to preexisting contours, repaved, and restored to existing uses. A groundwater monitoring program will be conducted to monitor natural degradation of groundwater COCs by natural processes in the areas below Federal Avenue, and otherwise inaccessible to excavation.

- 12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the Site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.**

The Ecology Site is located at 2717/2731 Federal Avenue in Everett, Washington (Township 29 North, Range 5 East, Section 19). The Ecology Site location boundaries are shown in Figures 1 and 2.

The Ecology Site is defined as the ExxonMobil and ADC properties, and the surrounding rights-of-way and properties that were affected by the migration of hydrocarbons in soil and groundwater.



B. Environmental Elements

1. EARTH

a. General description of the Site:

The Ecology Site is graded, generally flat, and paved; with the exception of smaller graveled areas, and some ruderal vegetation growing along a fence-line.

b. What is the steepest slope on the Site (approximate percent slope)?

The area is flat. Prior to development it sloped gently to the west toward Port Gardner Bay.

c. What general types of soils are found on the Site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

According to historical aerial photography most of the proposed remedial excavation area was infilled during shoreline expansion efforts between 1914 and 1947. Based on previous subsurface investigations conducted at the Ecology Site and surrounding vicinity, the near-surface soils consist of a heterogeneous mixture of fill materials. The fill materials consist of very loose to medium dense, brown, brownish gray, and gray silty sand and sand with areas of wood and concrete debris extending to depths of approximately 5 to 10 feet below ground surface (bgs). Gray silty sand and silt and dark-brown to black peat mixed with wood debris are encountered beneath the shallow fill and extend up to 20 to 27 feet bgs (Wood, 2019; Cardno, 2020a; 2020b).

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

The area immediately east of the Ecology Site, across Terminal Ave, is classified as a landslide hazard, and the Terminal Ave Overpass on the southeast corner of the Ecology Site is classified as an erosion hazard. See Section 8(h) for additional detail.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The total remedial excavation footprint of both areas is 1.40 acres. On the west side of Federal Avenue, 0.46 acre was already excavated, and the proposed footprint of the area that is left to be excavated on the east side of Federal Avenue is 0.94 acre. The Project Area is entirely within the Ecology Site boundary and will exclude the Federal Avenue right-of-way (Figures 3 and 4). Approximately 22,500 cubic yards (41,250 tons) of impacted soil will be excavated from the Project Area in total. Excavation of the west side had 7,500 cubic yards (12,375 tons) of soil removed, and it is proposed that 15,000 cubic yards (28,875 tons) will be excavated from the east side. Impacted soils will be disposed of offsite at a permitted location. Once excavation is complete, the excavated areas will be backfilled with clean granular fill material suitable for compaction and repaved. Areas



B Environmental Elements

within Port Property will be backfilled and restored according to specifications in an agreement with the Port of Everett.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion may occur within the footprint of the excavation and soil stockpiles could erode.

g. About what percent of the Site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

100 percent

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Best Management Practices (BMPs) will be implemented to reduce erosion associated with the remediation activities. BMPs that will be implemented include silt fencing, erosion control straw wattles, sediment traps, sloping, shoring, covering stockpiles, maintaining construction entrances with coarse gravel, and preventing vehicles from driving across non-maintained surfaces. These BMPs will be implemented throughout the duration of the remedial activities, and work will be conducted in compliance with City of Everett erosion control requirements.

2. AIR

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Onsite emissions would be associated with operation of personnel vehicles and diesel-fueled construction equipment during shoring installation/removal, soil removal, backfill, paving, and ongoing monitoring efforts. Equipment will include excavators, cranes, dump trucks with trailers, a shoring pile drill rig, paving equipment, and various mechanical tools. Offsite emissions would be associated with transportation of impacted soils by truck and rail to an approved disposal facility and import of clean backfill material.

b. Are there any offsite sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

None.



B Environmental Elements

3. WATER

a. Surface Water

1. *Is there any surface water body on or in the immediate vicinity of the Site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.*

The shoreline of Port Gardner Bay is approximately 300 feet northwest of the Ecology Site.

2. *Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.*

No.

3. *Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the Ecology Site that would be affected. Indicate the source of fill material.*

None.

4. *Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.*

No.

5. *Does the proposal lie within a 100-year floodplain? If so, note location on the Ecology Site plan.*

No.

6. *Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.*

No.

b. Ground Water

1. *Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.*

Impacted soils to be excavated are located below the water table. During previous Ecology Site investigations, groundwater was observed at depths in the 5-foot bgs range to the south, and 15-foot bgs range to the north (Cardno 2020a, 2020b). During remedial excavation some dewatering may be required; the approximate dewatering requirements are unknown. Wastewater disposal is addressed in Section 3(c). No groundwater will be withdrawn for drinking water purposes.



B Environmental Elements

2. *Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.*

None.

c. Water Runoff (Including Stormwater)

1. *Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.*

Surface water drainage is controlled largely by surface topography and engineered drainage structures. Stormwater generally flows to the west and northwest, following the surface slope, toward catch basins located on the Ecology Site and on Federal Avenue directly west of the Ecology Site. Storm sewers serving the vicinity discharge to Port Gardner Bay via the storm sewer discharge located near the northwest corner of the Port Property leased by Dunlap Towing. Some surface water may flow north toward the former Kimberly-Clark Corporation (Kimberly-Clark) property, which is now owned by the Port of Everett, and south from the Ecology Site to the City of Everett parcel (Wood, 2019).

2. *Could waste materials enter ground or surface waters? If so, generally describe.*

Impacted soils will be placed directly into dump trucks and hauled offsite. Temporary stockpiling of soil may be necessary prior to removal offsite. Stockpiles would be placed on plastic sheeting, stabilized, and covered to avoid any potential impacts to groundwater or surface water.

3. *Does the proposal alter or otherwise affect drainage patterns in the vicinity of the Site? If so, describe.*

No. The Project Area will be regraded and repaved to existing conditions.

4. *Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:*

Erosion and sediment control BMPs consistent with Ecology's current Stormwater Management Manual for Western Washington (SWMMWW) will be used during the excavation to prevent impacts to stormwater. A temporary erosion and sediment control plan will be prepared to prevent sediment, debris, and sediment-laden water from leaving the Project Area, entering adjacent surface streets, storm drains, and the Puget Sound. Proposed temporary erosion and sediment control elements will include the following:

- Use of silt/filter fabric fences, straw bales, straw wattles, storm drain inlet protection, catch basin silt barriers and/or similar BMPs.
- Diversion BMPs to prevent offsite stormwater from entering the excavation area.



B Environmental Elements

- Implementation of BMPs at the construction entrance/exit and internal haul routes to minimize the tracking of soil onto the adjacent surface streets.
- Street sweeping and/or street cleaning, as necessary, to remove soil tracked onto the adjacent surface streets.
- Implementation of stockpile BMPs.

Any wastewater generated during dewatering activities will be properly managed under a City of Everett-approved permit, and in compliance with the City's Industrial Pretreatment Ordinance #3070-08, as amended. Wastewater will be discharged at an approved flow rate to the permit-specified discharge point. Routine samples will be collected of the wastewater to confirm that it is compliant with the applicable discharge levels for contaminants. All wastewater discharge data from the Project (e.g., sample data, discharge events, and total volume discharged) will be recorded.

A low permeability barrier wall will be constructed in a north to south trending direction against the excavation wall along the western side of Federal Avenue. The barrier wall will be designed limit migration onto Port Property following the remedial excavation.

4. PLANTS

a. Check the types of vegetation found on the Site:

- deciduous tree: alder, maple, aspen, other
- evergreen tree: fir, cedar, pine, other
- shrubs
- grass
- pasture
- crop or grain
- orchards, vineyards or other permanent crops.
- wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
- water plants: water lily, eelgrass, milfoil, other
- other types of vegetation



B Environmental Elements

b. What kind and amount of vegetation will be removed or altered?

None. The small area with perennial grasses and noxious weeds will not be excavated or otherwise disturbed.

c. List threatened and endangered species known to be on or near the Site.

None. The entire Ecology Site is graded and developed. No functional native plant habitat occurs on the Ecology Site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the Site, if any:

None.

e. List all noxious weeds and invasive species known to be on or near the Site.

- Class B: butterfly bush (*Buddleja davidii*)
- Class C: Himalayan blackberry (*Rubus bifrons*)

5. ANIMALS

a. List any birds and other animals which have been observed on or near the Site or are known to be on or near the Site.

The Port Property is located near the marine shoreline in the Snohomish River basin, in an area zoned for heavy industrial use. No wetlands, streams, shorelines, floodplains, or functional wildlife habitat occur on the Ecology Site. Nearby environmentally sensitive areas include Port Gardner Bay and the Snohomish River. The shoreline nearest the Ecology Site is deepwater that has been heavily modified by dredging, filling, and shoreline development; there is limited subtidal and intertidal habitat (Wood, 2019). Common wildlife species known to occur in urban/heavily industrial areas may be present onsite.

b. List any threatened and endangered species known to be on or near the Site.

No threatened and endangered animal species would occur at the Ecology Site. Species listed under the Endangered Species Act (ESA) and Washington State Priority Species that may be present in Port Gardner Bay are detailed in Wood's *Site characterization/focused feasibility study report*, dated August 23, 2019, for the Ecology Site (Wood, 2019).

c. Is the Site part of a migration route? If so, explain.

No.

d. Proposed measures to preserve or enhance wildlife, if any:

Not applicable (N/A).

e. List any invasive animal species known to be on or near the Site.

None.



B Environmental Elements

6. ENERGY AND NATURAL RESOURCES

- a. **What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.**

N/A.

- b. **Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.**

No.

- c. **What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:**

N/A

7. ENVIRONMENTAL HEALTH

- a. **Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.**

1. *Describe any known or possible contamination at the Site from present or past uses.*

The Ecology Site historically operated as a bulk petroleum storage, transfer, and distribution facility. Additional potential sources of contaminants of concern includes releases from the former rail loading racks located east of the ExxonMobil ADC Property, underneath the current Terminal Avenue Overpass (Stantec, 2023) investigations have been conducted to characterize the Ecology Site soil and groundwater contamination. The COCs known to occur at the Ecology Site include:

- TPHg (total petroleum hydrocarbons as gasoline)
- TPHd (total petroleum hydrocarbons as diesel)
- TPHmo (total petroleum hydrocarbons as motor oil)
- Benzene
- Ethylbenzene
- Total Xylenes
- Total cPAHs (carcinogenic polycyclic aromatic hydrocarbons)
- 1-Methylnaphthalene (Wood, 2019)

2. *Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the Project Area and in the vicinity.*

No underground hazardous liquid and gas transmission pipelines are located on or below the Ecology Site.



B Environmental Elements

3. *Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.*

Vehicles and equipment used and stored onsite could have minor leaks (e.g., fuel, oil, hydraulic fluids, etc.).

4. *Describe special emergency services that might be required.*

None.

5. *Proposed measures to reduce or control environmental health hazards, if any:*

The purpose of the proposed Project is to cleanup and monitor environmental health hazards. Spill kits/absorbent cleanup materials will be available onsite and if used, disposed of properly.

b. Noise

1. *What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?*

The Project is located within and adjacent to the Port of Everett, a heavy industrial use area. Noise from Port of Everett operations including heavy machinery use and noise associated with truck, ship, and rail traffic are present.

2. *What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the Site.*

Noise generated by vehicles and equipment during remedial excavation are compatible with the surrounding baseline noise levels that exist. Noise will be short-term: only lasting the duration of the shoring install and excavation. Larger equipment and vehicles will only operate in daylight hours, generally between 7 AM and 5 PM.

3. *Proposed measures to reduce or control noise impacts, if any:*

N/A.

8. LAND AND SHORELINE USE

- a. **What is the current use of the Site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.**

The Ecology Site includes an asphalt-paved parking lot and portions of former Everett Avenue, Federal Avenue, and Port properties just west of Federal Avenue. It also includes portions of the City of Everett rights-of-way east and south of the ExxonMobil ADC Property, a BNSF parcel, a BNSF railway corridor right-of-way east of the ExxonMobil ADC Property, and the land under the Terminal Avenue Overpass. The Ecology Site is adjoined by the following properties:



B Environmental Elements

- The former Kimberly-Clark property, now owned by the Port of Everett, is located immediately north at 2600 Federal Avenue. The Kimberly-Clark property was used for several decades for wood and paper products manufacturing. It housed former bulk petroleum storage tanks and currently includes a warehouse near the southern end adjacent to the ExxonMobil ADC Property. Most of the former paper manufacturing facility was demolished in 2012 (Wood, 2019).
- A City of Everett right-of-way is located immediately east of the Ecology Site. The City of Everett right-of-way is currently paved with asphalt and is otherwise unoccupied.
- Another City of Everett right-of-way is located immediately south of the Ecology Site. This right-of-way was formerly part of the ExxonMobil parcel but was transferred to the City of Everett as part of the Terminal Avenue Overpass project (Wood, 2019). This right-of-way is currently paved with asphalt and is otherwise unoccupied.
- Federal Avenue is located immediately east of the Port Property. Federal Avenue is a public street and a City of Everett utility corridor.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe how much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?**

No.

1. *Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:*

No.

- c. Describe any structures on the Site.**

A wheeled-trailer used by Everett Ship Repair as an administrative office is currently located on the northwest corner of the Ecology Site. It was temporarily relocated during remedial excavation activities.

- d. Will any structures be demolished? If so, what?**

No.

- e. What is the current zoning classification of the Site?**

The Ecology Site is zoned M-2 Heavy Manufacturing land use by the City of Everett.

- f. What is the current comprehensive plan designation of the Site?**

The City's comprehensive plan shows the Ecology Site as E.5.1 Heavy Industrial land use.



B Environmental Elements

g. If applicable, what is the current shoreline master program designation of the Site?

The northwest corner of the Ecology Site is located within or immediately adjacent to an area designated as Urban Deepwater Port (UDWP) in the City of Everett's Shoreline Master Program (City of Everett, 2019).

h. Has any part of the Site been classified as a critical area by the City or County? If so, specify.

The portion of the Ecology Site with the Terminal Ave Overpass is classified as a Critical Area Erosion Hazard with Very High/Severe Slopes of greater than 40% in Qva and Qal geologic units (City of Everett, 2006a).

The area immediately east of the Ecology Site across Terminal Ave is classified as a Critical Area Landslide Hazard, with Medium Slopes <15% for Qtb, Qw, and Qls geologic units and uncontrolled fill Slopes of 25% to 40% in "other" geologic units (City of Everett, 2006b).

i. Approximately how many people would reside or work in the completed project?

Upon completion of the Port Property portion of the Project, the wheeled trailer used by Everett Ship Repair as an administrative office was returned to the Ecology Site for use.

j. Approximately how many people would the completed project displace?

None.

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The Project is compatible with existing and future land uses and plans. The Ecology Site will likely continue as heavy industrial or commercial use for the foreseeable future. The City of Everett M-2 zoning allows for a mix of commercial and industrial uses at the Ecology Site, and specifically prohibits residential use and daycare facilities. Use of the Ecology Site for parks is allowed. The Ecology Site owners anticipate that institutional controls will be established, limiting use of the Ecology Site to industrial/commercial purposes. If future redevelopment requires installation of utilities or new structures, this may require implementation of passive or active vapor intrusion protection measures (Wood, 2019).

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

N/A.



B Environmental Elements

9. HOUSING

- a. **Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.**

None.

- b. **Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.**

None.

- c. **Proposed measures to reduce or control housing impacts, if any:**

None.

10. AESTHETICS

- a. **What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?**

No structures are proposed as part of the Project.

- b. **What views in the immediate vicinity would be altered or obstructed?**

None.

- c. **Proposed measures to reduce or control aesthetic impacts, if any:**

N/A

11. LIGHT AND GLARE

- a. **What type of light or glare will the proposal produce? What time of day would it mainly occur?**

Work outside of daylight hours will require overhead lighting. Light and glare from vehicles and equipment during the excavation and groundwater monitoring activities are consistent with existing sources of light and glare in the area.

- b. **Could light or glare from the finished project be a safety hazard or interfere with views?**

No.

- c. **What existing offsite sources of light or glare may affect your proposal?**

None.

- d. **Proposed measures to reduce or control light and glare impacts, if any:**

None.



12. RECREATION

a. What designated and informal recreational opportunities are in the immediate vicinity?

The parking area along Terminal Avenue for the Pigeon Creek Beach Trailhead is located approximately 300 feet south of the Ecology Site.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

N/A.

13. HISTORIC AND CULTURAL PRESERVATION

a. Are there any buildings, structures, or sites, located on or near the Site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

No permanent buildings, structures, or sites are within or immediately adjacent to the Project Area (defined as the boundaries of the Ecology Site). One archaeological resource (inventory ID: 45SN00629) was previously recorded approximately 0.07 mile north of the Project Area. The archaeological resource is a precontact isolated find identified within historic dredge material encountered beneath an asphalt-paved parking lot (Udem, 2014; Udem et al., 2014). Historically, the properties were the location of a mill situated at 2600 Federal Avenue (Boswell and Sharley, 2012). The single lithic artifact was recorded as an edge-altered basalt cobble with 13 multidirectional flake scars on one end.

The Kimberly-Clark Everett Mill Main Office located 0.09 mile north of the Project Area, was originally constructed in 1929 and consisted of a two-story Neoclassical rectangular structure with red brick cladding and low-pitched hipped roof. The building is recommended as eligible for listing in the National Register of Historic Places under Criterion A and listing in the Washington Heritage Register based on its historical association with the industrial development of the City of Everett (Sharley, 2012).

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the Site? Please list any professional studies conducted at the Site to identify such resources.

The current Project Area contains no historic or precontact landmarks, features, or other evidence. Ethnographic place names within Everett list several near the mouth of the Snohomish River and for water resources near Everett; however, none of these



B Environmental Elements

ethnographic place names are located within or immediately adjacent to the Project Area (Watermann, 1922; Watermann et al., 2001):

- *ʔusʔusič* (Watermann orthography: *Os3a/s1tc*) translates to “chasing a fish here and there” near an estuary between Steamboat and Union Sloughs.
- *bəluʔəb* (Watermann orthography: *PE'ls1b*) translates to “boiling” for an area at the mouth of the main Snohomish River channel.
- *čik'wucid* (Watermann orthography: *Ctcqo'tsid*) translates to “that which chokes up the mouth of something” for a small island located on the north side of the Snohomish River mouth.
- *sexwčulalqw* (Watermann orthography: *SExwčulalkw*) is noted for a sharp point of land running toward the Ctcqo'tsid island.
- *hibu'əb* (Watermann orthography: *Hibu'ʔub*) translates to “place where water boils out of the ground” for a former village site south of the Snohomish River mouth.
- Watermann orthography: *SEqwsu'3ub* is noted for a small promontory with a slough that runs parallel to the shore.
- *sluluw#* (Watermann orthography: *SLu'luw1L*) translates to “little perforation for a canoe” for a narrow channel passing behind an island.
- *ʔuxwaʔ* (Watermann orthography: *tL'o'hwaL*) translates to “a cold spring” for a spot on the riverbank opposite Everett.

Historically, most of the Project Area consisted of tidelands and the waters of Port Gardner Bay (Sanborn, 1902). The Ecology Site resides within the land claim of Dennis Brigham, who began the homestead process at this location in 1861 (General Land Office, 1869; Oakley, 2005). “Squatters Shacks” populated the Ecology Site area east of the railroad. Between 1914 and 1950, extensive fill material expanded the usable ground surface west (Sanborn, 1914; 1950).

- c. **Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the Department of Archaeology and Historic Preservation, archaeological surveys, historic maps, GIS data, etc.**

The Archaeological Assessment which describes the methods used to assess the potential impacts to cultural and historic resources on or near the Project Area is appended to this checklist (Appendix B).

- d. **Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.**

A Monitoring and Inadvertent Discovery Plan (MIDP) will be utilized to minimize potential impacts to any currently unknown intact archaeological resources and that all Project-related ground-disturbing activities in native sediment be monitored. Monitoring is not recommended in glacial deposits and sediments, nor in existing areas where disturbance has already occurred. Monitoring will be conducted by a professional archaeologist who meets the Secretary of the Interior's (SOI's) professional qualifications standards (36



B Environmental Elements

Code of Federal Regulations [CFR] Part 61) for archaeology or by a qualified archaeologist supervised by a professional archaeologist who meets the SOI standards.

14. TRANSPORTATION

- a. Identify public streets and highways serving the Site or affected geographic area and describe proposed access to the existing street system. Show onsite plans, if any.**

The Ecology Site is accessible from Federal Avenue, via Terminal Avenue. Federal Avenue is a public 2-way paved street that crosses the Ecology Site and provides access to private and Port Property.

- b. Is the Site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?**

No. The nearest transit stop is located approximately 0.1 mile east of the Ecology Site at West Marine View Drive and California Street.

- c. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).**

No.

- d. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.**

The BNSF railroad right-of-way is located approximately 80 feet east of the Ecology Site, and the Hewitt Terminal and the Norton Terminal, with deepwater vessel access, is located approximately 300 feet west and 130 feet east of the Ecology Site, respectively.

- e. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?**

Excavation of both areas requires removal of approximately 42,900 tons of soil, and a single truck/trailer combo can haul approximately 15 tons per load. Excavation of the west side required the removal of 7,500 cubic yards (12,375 tons) of soil with approximately 830 truck trips, whereas excavation of the west side will require removal of 18,500 cubic yards (30,525 tons) of soil with approximately 2,050 truck trips.

Assuming the current schedule, an average of 75 vehicular trips per day would be generated by the Project, with a peak of 200 vehicle trips per day during the excavation and backfill activities during the Project. Peak volumes would occur during daytime hours, and 75 percent would be from commercial/nonpassenger vehicles hauling soil to and from the Ecology Site. This data is based on knowledge of similar projects, and approximate calculation of truck capacity. Loaded trucks will be covered to prevent dust and soils from escaping during transit.



B Environmental Elements

- f. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.**

No.

- g. Proposed measures to reduce or control transportation impacts, if any:**

No excavation within the Federal Avenue right-of-way will occur, and no significant impacts to transportation are anticipated. Federal Avenue currently serves Dunlap Towing, Everett Ship Repair, and the Port of Everett Norton Terminal. Prior to closure of the Kimberly-Clark mill just north of the Ecology Site, Federal Avenue experienced an average of 220 daily truck trips and 500 employee trips per day (Kimberly-Clark, 2012). The Project is being undertaken in collaboration with the Port, and access will be maintained for all Port tenants serviced by Federal Avenue. City of Everett traffic control requirements will be followed.

15. PUBLIC SERVICES

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.**

No.

- b. Proposed measures to reduce or control direct impacts on public services, if any.**

N/A.

16. UTILITIES

- a. Circle utilities currently available at the Site:**

Stormwater drainage lines are present beneath the Ecology Site. Underground stormwater, sanitary sewer, water, and telephone lines run beneath Federal Avenue and the adjoining former Kimberly-Clark property. The City of Everett's new 24-inch underground force main also runs beneath Federal Avenue and the former Kimberly-Clark property. An overhead power line runs along Federal Avenue and the former Kimberly-Clark property (Wood, 2019).

- b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the Site or in the immediate vicinity which might be needed.**

N/A.



ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington

C Signature

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.



Signature: _____

Name of signee: Adele Pozzuto

Position and Agency/Organization: Senior Environmental Scientist, Stantec

Date Submitted: May 30, 2023



D. References

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ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington

D References

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Figures

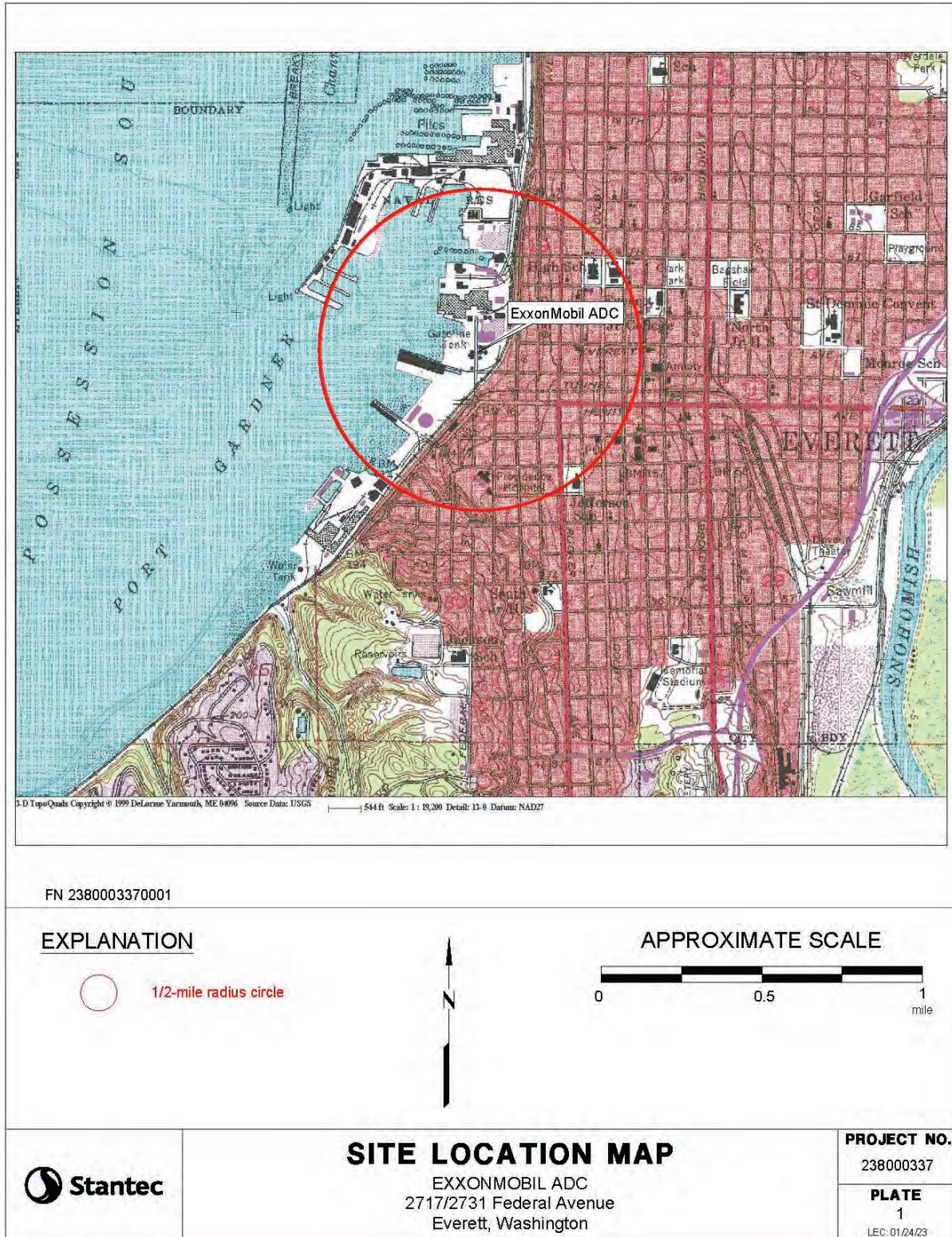


Figure 1 Site Location



ExxonMobil ADC
 2717/2731 Federal Avenue
 Everett, Washington

Figures



Figure 2 Site Boundary

Project Number: 238000337

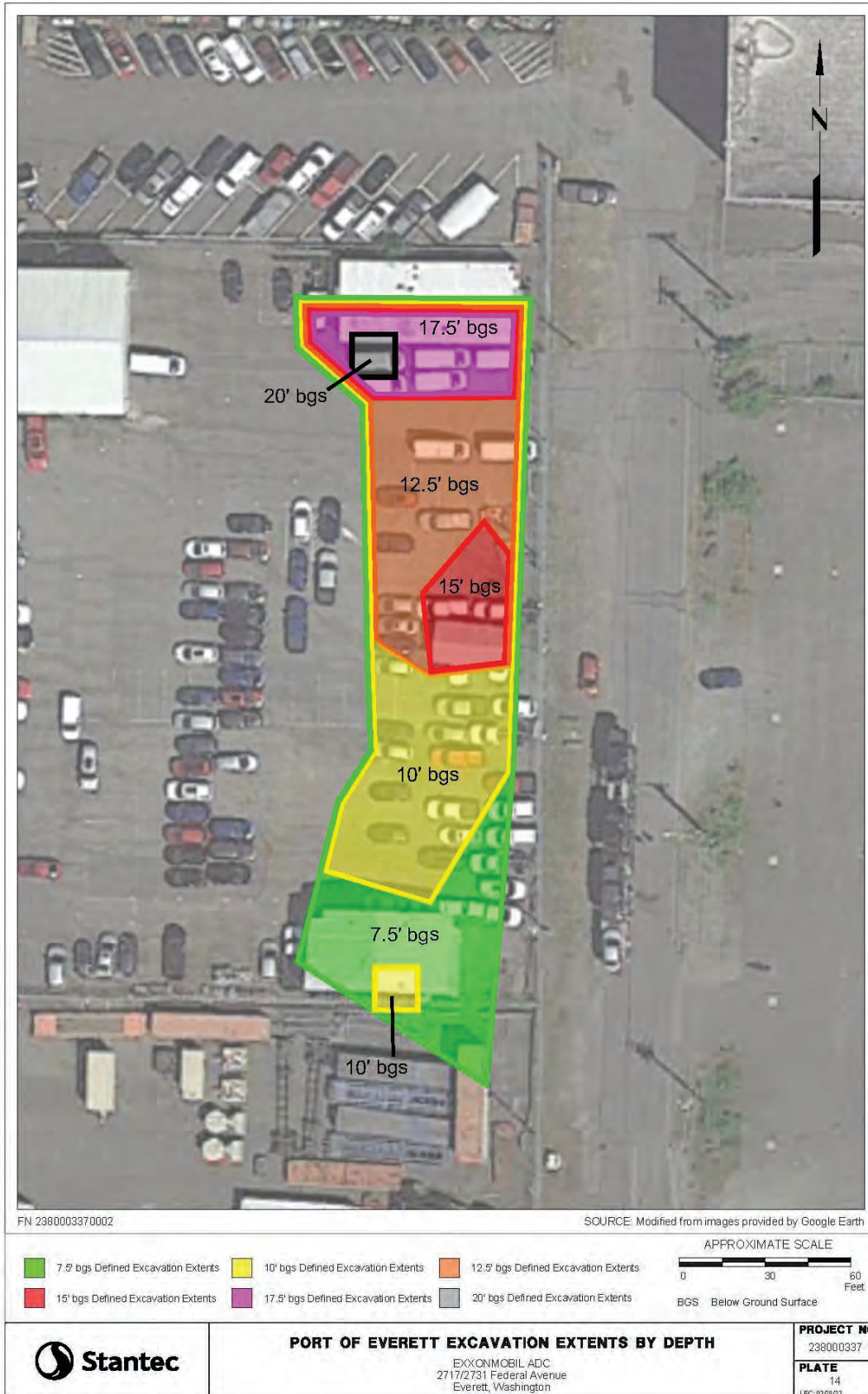


Figure 3 Proposed Excavation Extent on West Side of Federal Avenue





Figure 4 Proposed Excavation Extent on East Side of Federal Avenue



ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington

Appendix A

APPENDIX A

List of Environmental Investigations and Reports



List of Environmental Investigations and Reports

Date	Consultant	Location	Report/Activities	Summary
Jul-23 (estimated)	Stantec	Ecology Site	Agreed Order	A new Agreed Order will be negotiated with Ecology prior to remedial activities.
Jul-23 (estimated)	Stantec	Ecology Site	Draft Cleanup Action Plan (CAP)	The draft CAP describes the cleanup standards for the Ecology Site, the cleanup methods selected to achieve the cleanup standards, and the rationale for these decisions. Stantec submitted the draft CAP to Ecology in July 2023. The CAP will be finalized after public comment.
Jun-22 – Mar 23	Cardno and Stantec	Ecology Site	Port of Everett Excavation	Completed Port of Everett excavation located west of the ExxonMobil ADC property in accordance with the interim action work plan.
Jul-22	Cardno	Port of Everett	Engineering Design Report for Port of Everett Excavation	The Engineering Design Report documented technical specifications, plan sets, and engineering design drawings used to manage and implement the selected environmental remedy described in the Port of Everett interim action work Plan.
Jun-22	Cardno	Port of Everett	Interim Action Work Plan	Interim action plan submitted to Ecology to excavate the Site west of Federal Avenue (Port of Everett) pursuant to WAC 173-340-430.
Apr-22	Cardno	Ecology Site	Monitoring and Inadvertent Discovery Plan (MIDP)	Developed MIDP to minimize potential impacts to any currently unknown intact archaeological resources and ensure that all project-related ground-disturbing activities in native sediment be monitored.
Jan-22 – Jun-22	Strider	Federal Avenue	Federal Avenue Trenching	Soil samples collected during utility trenching and test pits conducted by the Port of Everett to characterize soil that will remain in place beneath the City of Everett right-of-way beneath and adjacent to Federal Avenue.
Dec-21	Cardno	Port of Everett	Conditional point of compliance well installation and well decommissioning	Conditional point of compliance well MW-A9 was installed and surveyed. Monitoring well MW-33 was decommissioned due to its location within the proposed Port of Everett excavation footprint.



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Date	Consultant	Location	Report/Activities	Summary
Nov-21	Cardno	Ecology Site	Archaeological Assessment	The Archaeological Assessment was prepared to determine the probability for encountering archaeological resources during remedial excavation.
Aug-21 and Oct-21	Cardno	ExxonMobil ADC Property	Excavation delineation	A total of 74 soil borings were drilled on the ExxonMobil ADC Property and soil samples were analyzed to delineate areas exceeding remediation levels for future excavation. Two geotechnical borings were also advanced. Analytical results were used so that collection of sidewall and base soil samples during future excavation work is not necessary.
Oct-2020, Jan-2021, and Feb-2021	Cardno	Port of Everett	Excavation delineation	A total of 51 soil borings were drilled on the Port of Everett property and soil samples were analyzed to delineate areas exceeding remediation levels for future excavation. Two geotechnical borings were also advanced. Analytical results were used so that collection of sidewall and base soil samples during future excavation work is not necessary.
2019	Wood	Ecology Site	Site Characterization/ Focused Feasibility Study (SC/FFS)	SC/FFS identifies the recommended cleanup alternative for the Site. The study will be finalized after public comment.
2013 – 2014	AMEC	Ecology Site	Data gaps investigation	A total of 33 soil borings were drilled on the Property and nearby properties, and soil samples were analyzed to delineate areas of affected soil at the Ecology Site. One of the borings was completed as a monitoring well (MW-A8).
2012	AMEC	Federal Avenue and former Everett Avenue	Observations during City of Everett force main replacement	Observed excavation and drilling activities during installation of the City of Everett's force main and recorded notable subsurface features when relevant, including the presence of LNAPL if encountered.
2011	AMEC	Former Everett Avenue	Observations of seeps along former Everett Avenue	Photographs to document observations of petroleum product seeps through the pavement on former Everett Avenue.



Appendix A

Date	Consultant	Location	Report/Activities	Summary
2011	AMEC	Ecology Site	Tidal influence investigation	A stilling well with transducer was installed on the Everett Pier to automatically record tidal elevations. Pressure transducers/data loggers were installed in monitoring wells W-3, W-6, MW-11, MW-19, MW-28, MW-40R, and MW-A1 through MW-A7 to record groundwater levels every 6 minutes for 6 days.
2011	AMEC	Ecology Site	Data gaps investigation	Seven deep borings (AB-1 to AB-5, AP-6, MW-7ab), six shallow borings (AP-1 through AP-5, AP-7), five new monitoring wells (MW-A3 through MW-A7) located off of the ExxonMobil ADC Property, aquifer testing, and tidal influence study.
2010	AMEC	Ecology Site	Sampling for City of Everett Force Main	Borings CE-1 to CE-8 advanced on Federal Avenue, former Everett Avenue, and the BNSF property to characterize soils in the alignment of City of Everett's planned force main.
2010	Ecology	Ecology Site	Agreed Order DE 6184	Agreed Order requiring a FFS and development of a draft CAP to identify the nature and extent of hydrocarbons in soil and groundwater and select a preferred final interim action to remediate the Ecology Site
2010	AMEC	Ecology Site	Focused Feasibility Study Work Plan	Summarized the Ecology Site history, previous environmental investigations, and interim remedial activities, known environmental conditions, preliminary conceptual site model, and remaining data gaps.
Jun-08	AMEC	Ecology Site	Wellhead elevation survey	Surveyed recovery and monitoring wells located on the Ecology Site.
Feb-08	AMEC	Ecology Site	Tidal study	Measured tidal response in W-3, W-6, MW-11, MW-28, & MW-40R.
2008	AMEC	West of the ExxonMobil ADC Property	Monitoring well installation	Off-property monitoring wells MW-A1 and MW-A2 installed on the west side of Federal Avenue.
2007 – present	AMEC, Wood, Cardno, and Stantec	Ecology Site	Groundwater monitoring	AMEC requested to change to semiannual groundwater monitoring in 2007.



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Date	Consultant	Location	Report/Activities	Summary
Feb-07	AMEC	Ecology Site	Video survey of storm drain system	Conducted a video survey of the storm drain system installed as part of 1999 interim measure to verify that groundwater from the ExxonMobil ADC Property was not infiltrating into the stormwater system through possible cracks and fissures in the piping and catch basins.
Jul-02	ERI	West of the ExxonMobil Parcel	Well decommissioning	Monitoring wells MW-20, MW-21, and one unidentified well were decommissioned.
2002 – 2007	Kleinfelder, ERI, and AMEC	Ecology Site	Groundwater monitoring	Monthly LNAPL gauging and quarterly groundwater monitoring.
2002	Reid Middleton	CSTO	Memorandum to Ecology	Southeast corner of the asphalt cap over the ExxonMobil Parcel removed. Steel piles for concrete foundation were installed.
Feb-02	ERI	Ecology Site and vicinity	Monitoring well decommissioning and reinstallation	Decommissioning of monitoring wells (MW-22, MW-23, MW-24, MW-35, and MW-37) and piezometer DM-6 due to proximity to the CSTO Project. Reinstalled well W-2 screened from 3 to 23 feet bgs.
Jul-01	URS	Johnston Petroleum parcel	Borings	Phase II investigation for Johnson Petroleum parcel. Push-probe borings JP-1 through JP-7.
Sep-00	URS	South, east, and southeast of the ExxonMobil ADC Property	Borings	Phase II investigation for the CSTO Project. Push-probe borings UG-1 through UG-12.
Dec-99	Dames and Moore and URS	South and southeast of the ExxonMobil ADC Property	Geotechnical drilling and piezometer installation	DM-6, DM-7, and DM-8 were sampled for environmental samples.
Oct-99	Kleinfelder	ExxonMobil ADC Property	Monitoring wells installation	Monitoring wells W-10R, W-15R, and MW-40R installed.
Jul-98	Exponent	Ecology Site	Final Interim Action Work Plan and Engineering Design Report	Exponent presented design for interim measures at the ExxonMobil ADC Property.



Appendix A

Date	Consultant	Location	Report/Activities	Summary
Jul-98	Exponent	Ecology Site	Remedial Investigation and Focused Feasibility Study	Exponent summarized the history of the ExxonMobil ADC Property and evaluated feasible remedial options for the Ecology Site.
Oct-98	Ecology	Ecology Site	Agreed Order DE98TC-P-N223	Agreed Order requiring the preparation of a Remedial Investigation/Focused Feasibility Study Report, Interim Action Work Plan, and the subsequent completion of the work described in the Interim Action Work Plan.
Nov-97 – Jan-98	Pacific Environmental Group, Inc.	Former Kimberly-Clark property	Borings, monitoring wells	Direct-push borings Probe-1 through Probe-15 were advanced, and 2-inch diameter monitoring wells KC-1 and KC-2 were installed inside the KC warehouse.
Feb-97	PTI	Ecology Site	LNAPL recovery technical memorandum	Technical memorandum to summarize environmental investigations, LNAPL recovery activities, and geology.
Aug-96	AGRA	Ecology Site	Monitoring wells	Gauged wells at the property.
Jun-96	AGRA	ADC Parcel	Borings, monitoring wells, and test pits	4-inch diameter recovery well VRW-1 and 2-inch diameter monitoring well MW-38 installed. Seven test pits TP-1-96 through TP-7-96 excavated.
May-96	AGRA	ADC Parcel	Borings	Bobcat borings BB-1 through BB-14.
Apr-96	City of Everett	North of the ExxonMobil ADC Property	Meeting	Meeting held to discuss options for repairing the section of CSO line.
Mar-96	AGRA	North of the ExxonMobil ADC Property	Borings	Direct-push soil borings GP-1 through GP-13. Borings associated with the CSO line repair.
Dec-95	RZA AGRA	Ecology Site	Groundwater monitoring	Groundwater monitoring event. Gauged wells: RW-2, B-2, MW-8, MW-9, MW-18, MW-15 through MW-18, MW-27, and MW-28.
Nov-95	RZA AGRA	Ecology Site	Groundwater monitoring	Groundwater monitoring event. Gauged wells: RW-1, RW-2, B-1, B-2, MW-6, MW-8 to MW-13, MW-15 to MW-18, MW-27 to MW-37, and NRW-1.
Oct-95	U.S. Coast Guard Puget Sound Marine Safety Office and City of Everett	North of the ExxonMobil ADC Property	Investigation of petroleum product discharge into Everett Harbor	Camera surveys of the sewer lines.



Appendix A

Date	Consultant	Location	Report/Activities	Summary
Jul-95	RZA AGRA	ADC Parcel	Quarterly groundwater monitoring	Groundwater monitoring event. Gauged wells: W-3, W-5, W-9, W-10, W-12 through W-15.
Apr-96	Ecology	Ecology Site	Agreed Order DE-95TC-N402	Agreed Order requiring cleanup, elimination, and/or containment of petroleum releases at and near the City of Everett's CSO.
Dec-93	RZA AGRA	West of ExxonMobil Parcel	Test pits, recovery trench	Excavated five test pits, TP-1 through TP-5, to depths ranging from 3 to 3.5 feet bgs. Recovery trench installed along the western border of ExxonMobil Parcel.
Dec-93	RZA AGRA	ExxonMobil Parcel and off-Property to the west	Quarterly groundwater monitoring	Groundwater monitoring event. Gauged wells B-1, B-2, MW-6, MW-8 through MW-13, MW-15 through MW-18, MW-27 through MW-33, MW-35 through MW-37.
Dec-93	RZA AGRA	West of ExxonMobil Parcel	Off-Property borings, monitoring well installation, GPR survey	2-inch diameter monitoring wells MW-31 through MW-33 and MW-35 through MW-37 were installed; B-34 advanced and backfilled. GPR survey was conducted to assess whether underground product lines had been removed.
1992	RZA AGRA	Ecology Site	Discussions with Ecology	Ecology discussed enforcement with Mobil and RZA AGRA. Ecology decided to allow Site to go independent.
Dec-91	RZA AGRA	ExxonMobil Parcel	Quarterly groundwater monitoring, aquifer, and tidal study	Quarterly groundwater monitoring. Gauged wells: RW-1, B-1, B-2, B-5, MW-6, MW-8 through MW-13, MW-15 through MW-30, and AD-19. Aquifer study involved 24-hour pumping from MW-10 at a rate of 1 to 2 gpm and measuring response in MW-18, RW-1, and RW-2 for 48 hours.
Nov-91	RZA AGRA	ExxonMobil Parcel	Borings, recovery well	8-inch diameter recovery well RW-2 installed. Deep soil borings B-1A, B-8A, and B-15A advanced.
Jun-91	RZA and ESE	ExxonMobil ADC Property	Quarterly groundwater monitoring	Groundwater monitoring event. 2-inch diameter monitoring wells MW-25 and MW-26 installed. Gauged wells: RW-1, B-1, B-2, B-5, MW-6, MW-8 through MW-13, MW-15 through MW-18, AD-19, W-1 through W-6, and W-8 through W-15.



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Date	Consultant	Location	Report/Activities	Summary
Mar – Jun-91	RZA	Parcels surrounding ExxonMobil Parcel	Borings, monitoring well installation	Six percussion soil borings to depths ranging from 5 to 5.5 feet bgs. 2-inch diameter monitoring wells MW-19 through MW-24, and 4-inch diameter monitoring wells MW-27 through MW-30 installed. Soil boring B-21-91 advanced to depth of 29 feet bgs.
Nov-90	Unknown	ExxonMobil Parcel	Monitoring well decommissioning	B-3 (MW-3), B-4 (MW-4), and MW-7 decommissioned.
Oct-90	RZA	ExxonMobil Parcel	Shallow grid soil sampling, bio-feasibility study	Hand augers B-1 through B-25. Two soil samples were studied to conduct a slurry flask bio-feasibility study.
Jun-90	ESE	ADC Parcel	Hand-auger borings	Hand-auger borings W-8 through W-17 to depths of 6–10 feet.
Feb-90	ESE	ADC Parcel	Borings, monitoring well installation	Borings W-1 through W-7. 2-inch diameter monitoring wells W-1 through W-6 installed.
Jan-90	ESE	ADC Parcel	Borings	Hand augers AD-01 through AD-19 to depths ranging from 1 to 4.5 feet bgs.
Mar-88	RZA	ExxonMobil Parcel	Borings, monitoring well installation	2-inch diameter monitoring wells MW-6 through MW-18 installed.
May-85	RZA	ExxonMobil Parcel	Borings, monitoring well installation	2-inch diameter monitoring wells B-1 through B-5 (MW-1 through MW-5 in several reports) installed.

Source: Wood, 2019

Abbreviations:

ADC = American Distributing Company
 AGRA = AGRA Earth & Environmental, Inc.
 AMEC = AMEC Environment & Infrastructure, Inc.
 bgs = below ground surface
 BNSF = BNSF Railway Company
 CAP = Cleanup Action Plan
 CSO = combined sewer overflow
 CSTO = California Street Overcrossing
 Ecology = Washington State Department of Ecology
 Ecology Site = Ecology recognized ExxonMobil ADC Site
 ERI = Environmental Resolutions, Inc.
 ESE = Environmental Science and Engineering, Inc.

FFS = Focused Feasibility Study
 gpm = gallons per minute
 GPR = ground penetrating radar
 KC = Kimberly-Clark Corporation
 Kleinfelder = Kleinfelder, Inc.
 LNAPL = light non-aqueous phase liquid
 MIDP = Monitoring and Inadvertent Discovery Plan
 Mobil = ExxonMobil Oil Corporation
 PTI = PTI Environmental Services
 RZA = Rittenhouse-Zeman & Associates, Inc.
 RZA AGRA = RZA AGRA Earth & Environmental, Inc.
 SC/FFS = Site Characterization/ Focused Feasibility Study



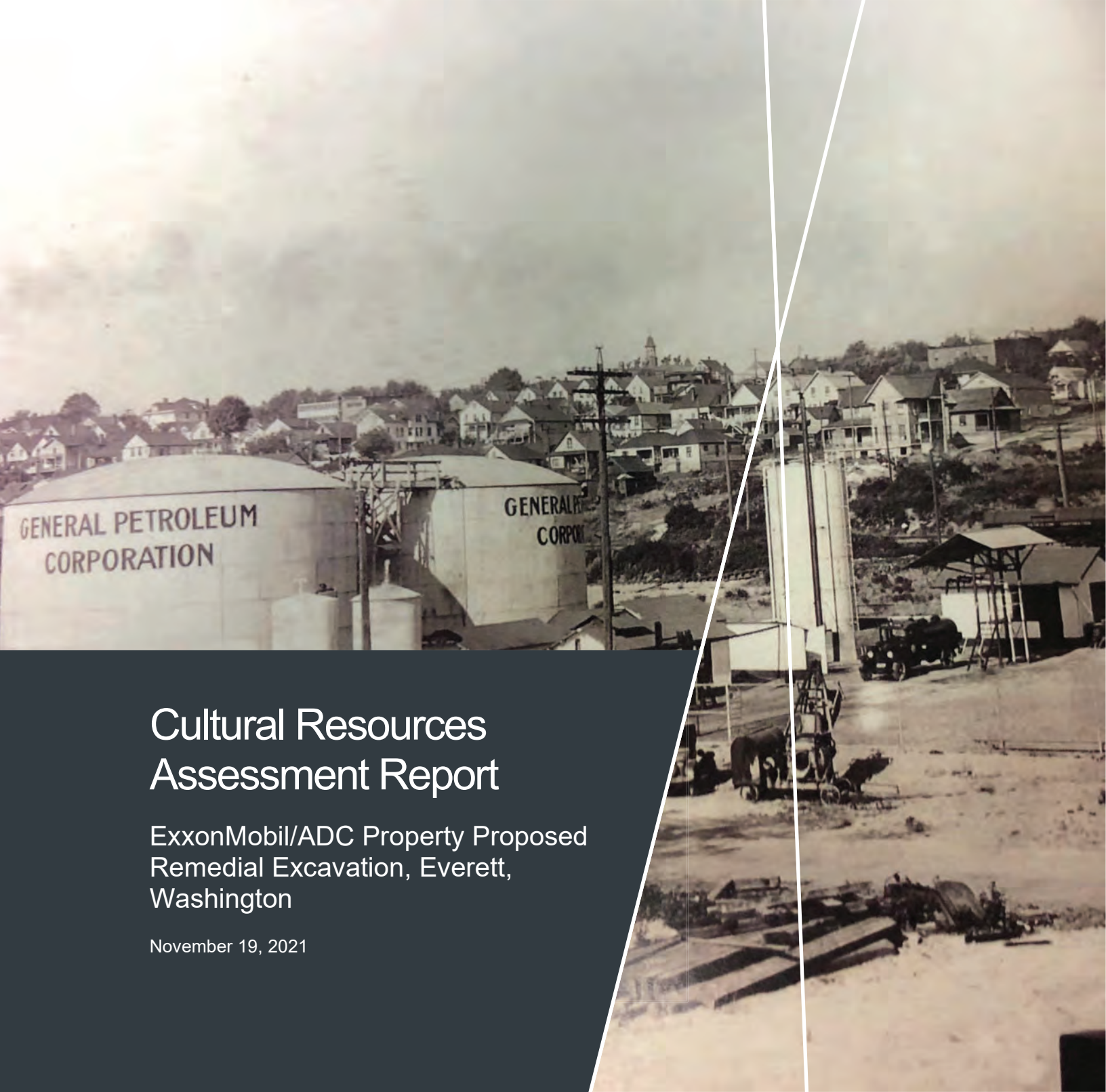
ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington
ExxonMobil Environmental and Property Solutions Company and American Distributing Company

Appendix B

APPENDIX B

Archaeological Assessment





Cultural Resources Assessment Report

ExxonMobil/ADC Property Proposed
Remedial Excavation, Everett,
Washington

November 19, 2021

Contact Information

Cardno, Inc.
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Executive Summary

Cardno, Inc. (Cardno) conducted a cultural resources assessment for the proposed ExxonMobil/American Distributing Company (ADC) project in Everett, Washington. The project proposed to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation. Historical releases of petroleum products have been documented within the project area due to former operations of bulk petroleum storage, transfer, and distribution facilities and operations of other similar companies on nearby parcels. The project area is currently developed with a paved parking lot.

Results of the cultural resources assessment for the project area indicate a high level of human activity took place adjacent to the project area during precontact and historic times. Given the history of the project area and its immediate vicinity, Cardno concludes that the potential for encountering subsurface archaeological deposits beneath the historic fill layers is moderate to high. Cardno recommends that a monitoring and inadvertent discovery plan (MIDP) be implemented to minimize potential impacts to any currently unknown intact archaeological resources.

1.0 Introduction

Cardno, Inc. (Cardno) conducted a cultural resources assessment for the proposed ExxonMobil/American Distributing Company (ADC) project in Everett, Washington (Figure 1). This project is listed by the Washington State Department of Ecology (Ecology) as Cleanup Site 5182. Historical releases of petroleum products have been documented within the project area due to former operations of bulk petroleum storage, transfer, and distribution facilities and operations of other similar companies on nearby parcels. The purpose of the project is to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation. Proposed cleanup activities include installation of shoring walls, and excavation of impacted soils. Following excavation of contaminated soils, the project area will be backfilled, re-graded to preexisting contours, removal of shoring walls, and repaved.

The project area consists of 3.48 acres that are comprised of several tax parcels and portions of the City of Everett's (City) Right-of-Way (ROW). Parcel information is provided below (Table 1; Figure 2). Currently, the project area consists of a paved parking lot with no extant structures or buildings (Figure 3).

The cultural resources assessment consisted of a literature review of existing cultural resource records for previously recorded historic, ethnohistoric, and precontact archaeological and built environment resources; a review of any local, state, and national register nomination forms; a review of previously conducted cultural resources investigations; and a review of any known or potential Traditional Cultural Properties (TCPs) located within 1.0 mile (1.6 kilometer [km]) of the project area. This research included a records search at the Department of Archaeology and Historic Preservation's (DAHP's) Washington Information System for Architectural and Archaeological Records Data (WISAARD) database. Additional resources that were consulted include historic-era aerial photographs, U.S. Geological Survey (USGS) maps, General Land Office (GLO) maps, Snohomish County atlases, and Sanborn Fire Insurance Maps.

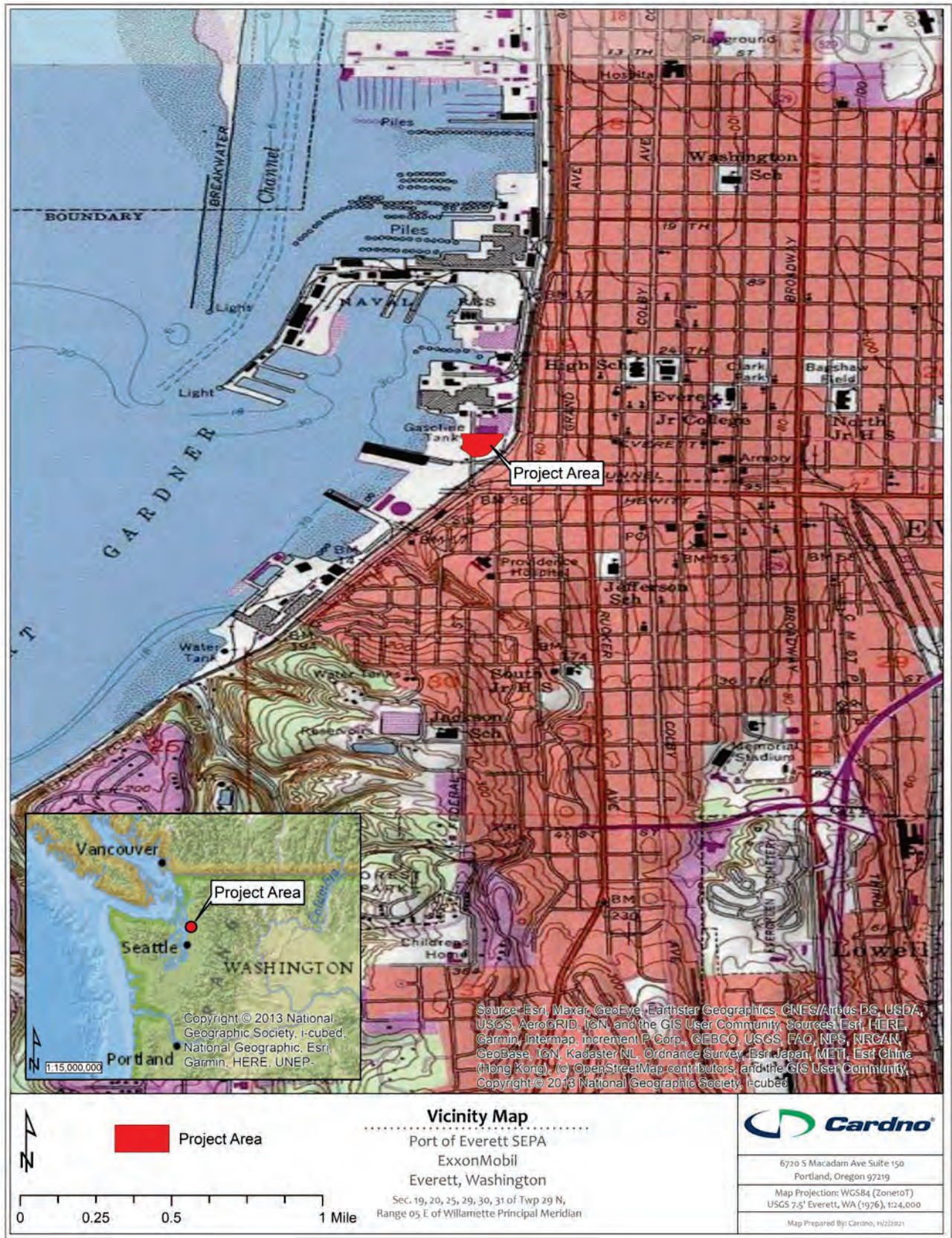


Figure 1. Project area and vicinity.

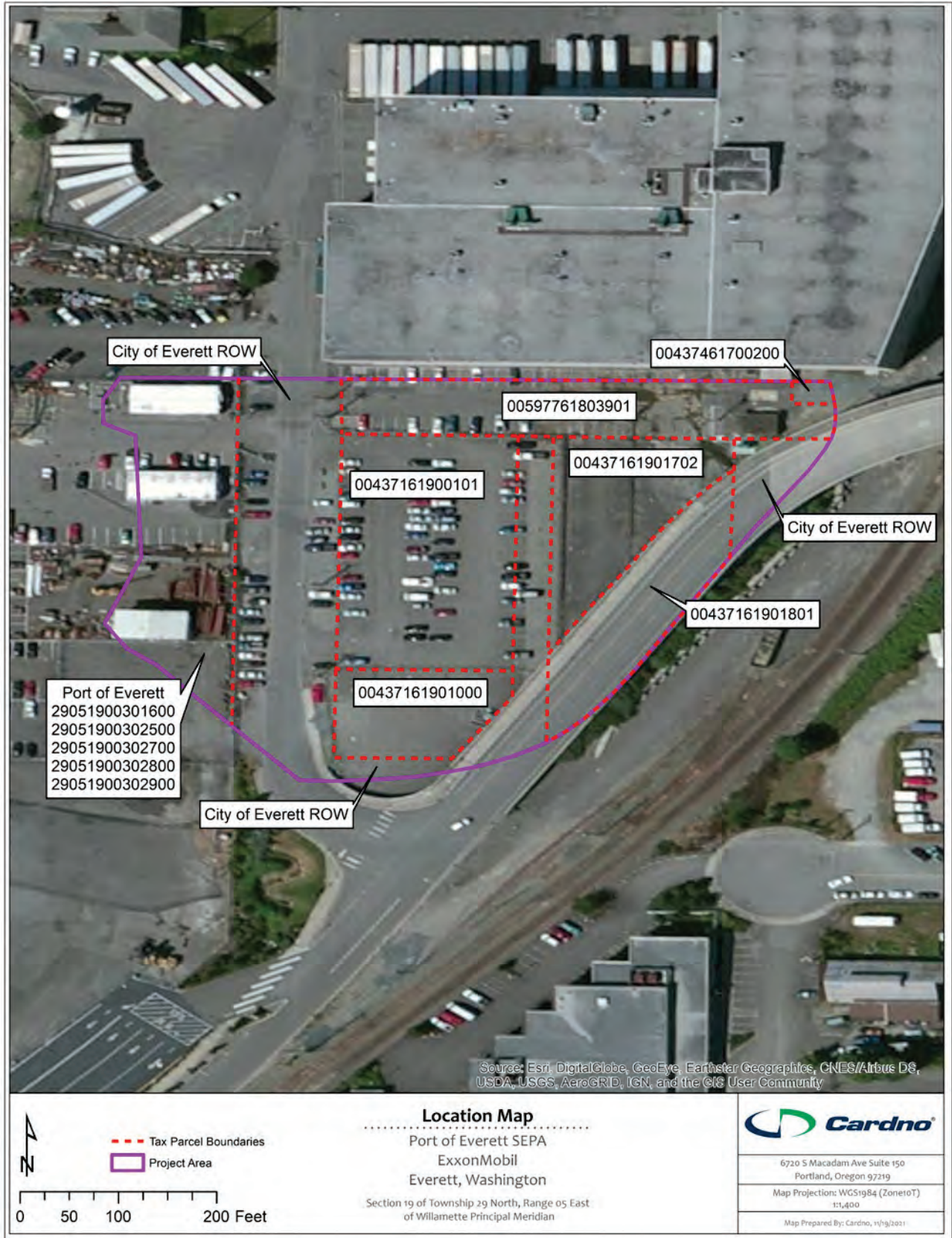


Figure 2. The project area denoting impacted Snohomish County tax parcels and City ROW.

Table 1. Snohomish County Tax Parcel Information.

Owners	Parcel Number(s)
Burlington Northern Railroad	00437161901702
City of Everett	00437161901801
Miller Trust (Cecilia Beverly Miller, beneficiary)	00437161900101
Mobil Oil Corporation	00437161901000
Port of Everett	00437461700200, 00597761803901, 29051900301600, 29051900302500, 29051900302700, 29051900302800, 29051900302900



Figure 3. Overview of project area, facing northeast.

2.0 Regulations

Cardno's cultural resources assessment was completed in compliance with Everett Municipal Code (EMC), Snohomish County Code (SCC), the State Environmental Policy Act (SEPA), and Revised Code of Washington (RCW). These regulations are discussed below. Additionally, information regarding other local, state, and federal regulations applicable to cultural resources is also provided.

2.1 Everett Municipal Code

EMC 19.28 outlines the process for identifying, listing, and protecting resources on the Everett Register of Historic Places and within historic overlay zones. Properties within historic overlay zones are governed by EMC 19.28.020 through 19.28.120. Criteria for placement on the Everett Register of Historic Places are described in EMC 19.28.130. Proposed changes to properties on the Everett Register are reviewed by the Everett historical commission per 19.28.140.

2.2 Snohomish County Code

SCC 30.67.340 requires developers and property owners to immediately stop work and notify the county, DAHP, and affected Indian tribes if archaeological resources are uncovered during excavation. It further stipulates that county permits issued in areas documented as containing archaeological resources require a site inspection or evaluation by a professional archaeologist in coordination with affected Indian tribes.

SCC 20.32D outlines the identification, evaluation, and protection of archaeological and historic resources within Snohomish County that are listed on the Washington State Archaeological Site Inventory. Additionally, it directs the preservation and rehabilitation of eligible historic properties for future generations. SCC 30.32D.020 established the Snohomish County Register of Historic Places, which includes historic buildings, sites, structures, objects, and districts within the county. SCC 30.32D.030-060 directs property designation to and removal from the Snohomish County Register of Historic Places, as well as alterations of properties on the register.

SCC 20.32D.070-100 outlines the process for obtaining and working under a certificate of appropriateness, and zoning. SCC 20.32D.200 requires recordation of archaeological sites. Additionally, completion of an archaeological report or relocation of a project is required for any construction, earth movement, clearing, or other site disturbance of a known archaeological site or any development application proposed on non-tribally owned, fee-simple properties designated Reservation Commercial on the Snohomish County Future Land Use Map. SCC 20.32D.220 outlines the process to follow if human remains or archaeological resources are found during construction, earth movement, clearing, or other site disturbance.

Lastly, SCC 30.32D.300 allows for an appeal process for any building permit issued with conditions imposed pursuant to this chapter. An appeal may occur as a Type 1 decision pursuant to SCC 30.71.

2.3 State Environmental Policy Act

The SEPA (RCW 43.21C) and its implementing rules contained in Washington Administrative Code (WAC) 197-11 require applicants to document cultural and historical significance that may be affected by project activities. The SEPA review process provides notice to all affected tribal, state, and private entities.

Per WAC 197-11-960, the SEPA checklist submitted to the local planning authority with an application for development review includes the following questions, which must be satisfactorily addressed to demonstrate that a project will not have a significant adverse impact on cultural and historic resources:

- a. *Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.*
- b. *Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.*

c. *Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archaeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.*

d. *Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.*

2.4 Revised Code of Washington 27.44 and 27.53

Precontact and historic archaeological sites are protected by several Washington state regulations on both public and private lands. RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the DAHP before excavating, removing, or altering Native American human remains or archaeological resources in Washington. A failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090.

If a person(s) violates this statute and knowingly disturbs or alters an archaeological site, the DAHP is allowed to issue civil penalties of up to \$5,000, in addition to site restoration costs and investigative costs per RCW 27.53.095. Restorative and monetary remedies do not prevent concerned Indian tribes from undertaking civil action in state or federal court or law enforcement agencies from undertaking criminal investigation or prosecution. If human remains and/or burials are disturbed, RCW 27.44.050 allows an affected Indian tribe to undertake civil action. Additionally, the excavation of human remains without a permit is a felony.

2.5 Revised Code of Washington 68.60

RCW 68.60 requires “expeditious” notification of local law enforcement and the coroner if skeletal human remains are discovered. Failure to notify is considered a misdemeanor.

2.6 Washington Administrative Code 25-48-060

The complete requirements for filing an archaeological excavation permit can be found in WAC 25-48-060. In the state of Washington, permits are required for alterations (e.g., excavation, removal, and collection of archaeological materials) at all precontact archaeological sites and at historic archaeological sites that are eligible for or listed in the National Register of Historic Places (NRHP).

2.7 Governor’s Executive Order 21-02

In 2021, Washington Governor Jay Inslee signed executive order 21-02, which supersedes the previous GEO 05-05. GEO 21-02 requires the preservation and protection of Washington’s cultural resources, which are defined as archaeological and historical sites, Native American sacred places and landscapes, and sites, buildings and places that hold special cultural historical, and spiritual significance. The GEO requires state agencies to review their capital construction projects and land acquisitions made for the purpose of a capital construction project that are not undergoing review under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) with the Washington State Department of Archaeology and Historic Preservation (DAHP) and affected Indian tribes to determine potential impacts to cultural resources. GEO 21-02 outlines the steps of review and consultation that should be undertaken as early in the project planning process as possible. In the event a culturally significant site will be impacted by a capital project, the state agency must work with the DAHP and affected Indian tribes on appropriate archaeological survey and mitigation strategies consistent with state and federal laws. Additionally, the state agency must take reasonable action to avoid, minimize, or mitigate adverse effects to the resource.

2.8 Washington Heritage Register

The Washington Heritage Register (WHR) is an official listing of historically significant sites and properties found throughout the state and includes districts, sites, buildings, structures, and objects that have been identified and documented as being significant in local or state history, architecture, archaeology, engineering, or culture. The WHR is governed by several state laws, including Senate Bill 363, RCW 27.34.200, and WAC 25-12.

Any subdivision of state government or recipient of state funds must comply with the SEPA and Executive Order 21-02. These programs require that significant properties, specifically those listed in or eligible for the WHR, be considered when state undertakings (e.g., permits, grants, construction) affect historic and cultural values. If significant resources are identified, the DAHP considers the effects of a proposed project on such resources and makes a professional recommendation for appropriate treatments or actions. The DAHP does not regulate the treatment of properties that are found to be significant, and the local governing authority may choose to uphold the DAHP's recommendation and may require mitigation of adverse effects to significant properties.

2.9 National Register of Historic Places

The NRHP (16 U.S. Code 470a), created under the National Historic Preservation Act of 1966, as amended (16 U.S. Code 470 et seq.), is the federal list of historical, archaeological, and cultural resources worthy of preservation. Resources listed in the NRHP include districts, sites, buildings, structures, and objects that are significant in American history, prehistory, architecture, archaeology, engineering, and culture and that possess integrity of location, design, setting, material, workmanship, feeling, and association. The NRHP is maintained by the National Park Service (NPS) on behalf of the Secretary of the Interior (SOI). The DAHP administers the statewide NRHP program under the direction of the State Historic Preservation Officer, located in Olympia, Washington. The NPS has developed NRHP Criteria for Evaluation (36 Code of Federal Regulations [CFR] § 60.4) to guide the evaluation of cultural resources that may be either listed in or eligible for the NRHP. The NRHP Criteria of Evaluation are:

Criterion A: Are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Are associated with the lives of persons significant in our past; or

Criterion C: Embody the distinctive characteristics of a type, period, or method of construction or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Have yielded, or may be likely to yield, information important in prehistory or history.

NPS Bulletin No.15, "How to Apply the National Register Criteria for Evaluation," provides guidance on evaluating resources for listing in the NRHP. Archaeological sites are primarily assessed under Criterion D. While cultural resources may be present within the project area, if they do not meet the requirements for listing in the NRHP, they are not considered historic properties. Cultural resources less than 50 years old do not meet the NRHP criteria unless they are of exceptional importance, as described in Criteria Consideration G (36 CFR Part 60) and NPS Bulletin No. 22, "How to Evaluate and Nominate Potential National Register Properties That Have Achieved Significance Within the Last 50 Years."

3.0 Environmental Setting

The project area lies within the greater Puget Lowland physiographic province, which is a low-lying area between the Cascade Range to the east and the Olympic Mountains to the west. Puget Sound was

shaped by widespread continental glaciation that extended south from British Columbia to the northern Puget Lowland and along the western flanks of the Cascade Mountains (Miss 2008). This area is also known as the Puget Sound Trough physiographic province, which extends to the Cowlitz and Chehalis Rivers (Franklin and Dyrness 1988). The Vashon Stade of the Fraser Glaciation was the last glacial maximum in the region and is dated between 18,000 and 14,000 years before present (BP) (Easterbrook 2003). Rapid deglaciation, which saw the occurrence of meltwater channels and temporary ice marginal lakes, occurred after this glaciation. The land experienced isostatic rebound between 13,000 and 7000 years BP as global sea levels rose and deltas formed at the head of the Duwamish Valley, shaping the Puget Sound shoreline (Dragovich et al. 1994; Miss 2008). By 5000 years BP, the Puget Sound sea level was within 6.6 to 9.8 feet (2 to 3 meters [m]) of its current level (Kelsey et al. 2004; Sherrod et al. 2000).

The project area lies within the *Tsuga heterophylla* (western hemlock) vegetation zone in the Puget Lowland, which provides a highly productive ecological system with a complex mosaic of microenvironments (Franklin and Dyrness 1988). This vegetation zone is characterized by forests of western hemlock, western red cedar, and Douglas-fir. Shrub cover consists of sword fern, salal, Oregon grape, ocean spray, huckleberry, and red elderberry. The diversity of floral and faunal species in the area has decreased due to human settlement, which has led to a significant loss of faunal habitat. Additionally, historical and modern contaminants within Port Gardner Bay have significantly impacted mudflats, estuaries, tidal marshes, and shrub wetlands. The National Oceanic and Atmospheric Administration's Damage Assessment, Remediation, and Restoration Program (2021) notes that:

Releases of hazardous substances into Port Gardner Bay have resulted from industrial and municipal processes since the early 1900s, including factories, spills during cargo transfer and refueling, storm water runoff through contaminated soils at upland facilities, discharge of contaminated groundwater, and lumber operations, such as sawmills, and pulp and paper mills.

Prior to historical and modern impacts, the *Tsuga heterophylla* vegetation zone could support large terrestrial animals like elk, deer, black bear, and coyote and smaller mammals like rabbit, squirrel, racoon, beaver, and river otter. Currently, the project area is located within modified industrial landscape with paved ground surface. Recent subsurface investigations note that the near-surface soils consist of a heterogeneous mixture of fill materials. The fill materials consist of very loose to medium dense, brown, brownish gray, and gray silty sand and sand with areas of wood and brick debris extending to depths of approximately 5 to 10 feet below ground surface (bgs). Gray silty sand and silt and dark-brown to black peat mixed with wood debris are encountered beneath the shallow fill and extend up to 20 to 27 feet bgs (Wood 2019, Cardno 2020a, 2020b).

3.1 Archaeology

The earliest known occupations in western Washington, termed Paleo-Indian, are evidenced by the appearance of large, fluted projectile points dating to approximately 12,800 years BP (Ames and Maschner 1999; Carlson 1990). Paleo-Indians were primarily hunter-gatherers with low populations and high levels of mobility. Some researchers have argued that these early people were maritime oriented (Carlson 2003; Dixon 1993; Fedje and Christensen 1999; Fladmark 1979). In western Washington, sites from this period are rare. Much of the late Pleistocene terrain was uninhabitable due to glaciers, and the lands that were occupied by Paleo-Indians were predominately coastal reaches. During the glaciation period, ocean levels fell almost 400 feet globally (Kirk and Daugherty 2007), but with the onset of the warming Holocene, ocean levels rose and submerged many of these coastal sites. However, some sites are not submerged and instead are located above the present shoreline due to eustatic, tectonic, and isostatic effects that vary throughout the region (Fedje and Christensen 1999).

The Archaic period dates from approximately 12,500 to 6,400 years BP (Ames and Maschner 1999; Carlson 1990). Archaic-period sites, similar to Paleo-Indian sites, are poorly represented. Changes in sea level and vegetation have obscured many Archaic-period sites along the coast (Ames and Maschner

1999). However, as the glaciers receded, people were able to occupy larger expanses in the interior of the Puget Sound. Archaic-period peoples likely maintained small populations and high levels of mobility, and focused on a combination of maritime, littoral, and terrestrial economies. Archaic-period occupations are largely characterized by stone tool assemblages that are typically composed of large, stemmed lanceolate projectile points and bifaces. In addition, the Pacific Northwest Archaic period saw an introduction of microblades, which are sometimes present in stone tool assemblages (Ames and Maschner 1999).

Pacific-period sites date from approximately 6,400 to 250 years BP. The period ends at the introduction of smallpox to the region (Ames and Maschner 1999). The Early Pacific period (6,400 to 3,800 years BP) was marked by the increased use of marine resources, the appearance of human burials in middens and cemeteries, a diversification in subsistence activities, the disappearance of microblade technology, and the increased use of bone, antler, and ground stone tools. Major developments also included the appearance of ground stone celts (adze blades) and a proliferation in chipped-stone tool forms and styles, and decorative/ornamental pieces that likely represent contact and trade with groups in neighboring cultural areas (Kirk and Daugherty 2007). The Middle Pacific period (3,800 to 1,800/1,500 years BP) displays major developments including the appearance of long-term settlements (plank houses), intensification of salmon capture (appearance of wooden fish weirs and girdled/drilled net sinkers), and a diversification in tool form and style. Late Pacific period (1,800/1,500 to 250 years BP) developments are represented by the appearance of heavy-duty woodworking tools, an overall decline in the use of chipped-stone tools, and an increase in funerary ritual/burial activities. Sea levels became stable by the start of the Middle Pacific period, and sites representing the Middle and Late Pacific periods are located across the Northwest Coast region (Ames and Maschner 1999).

3.2 Ethnography

The project area lies within the traditional territory of the Snohomish. Since time immemorial, the Snohomish people lived in various locations along the Snohomish River from present-day Monroe to the mouth of the river near Everett, on Camano Island, and on Whidbey Island (Ruby and Brown 1992:212; Tweddell 1974). The region was utilized for resource gathering, hunting, and villages/seasonal habitations. However, there are no known ethnographic sites within the immediate project area (Waterman et al. 2001).

The Snohomish spoke the southern dialects of Lushootseed—a Salish language (Suttles and Lane 1990:486). The Snohomish people followed a seasonal settlement pattern. Winter villages, composed of one or more cedar plank houses where families gathered in the late fall, were typically located along waterways, such as at the mouth of the Snohomish River, river confluences, or protected shorelines (Haeberlin and Gunther 1930; Lane and Lane 1977). During the winter months, they relied on stored foods supplemented by local hunting and fishing (Suttles and Lane 1990).

Coast Salish peoples developed a complex social and religious system in part due to the abundance of food and raw materials (e.g., wood, plants, stone) (Haeberlin and Gunther 1930). Potlatches and spirit quests were important activities in the pursuit of spiritual power, in addition to asserting control over resources and neighboring groups (Elmendorf 1971). Social stratification existed among Coast Salish groups, where villages consisted of elite, commoner, and slave classes (Ames 2001; Grier 2003; Tollefson 1987).

Winter housing consisted of large, multifamily longhouses constructed of cedar planks. Sleeping platforms lined the walls, and storage shelves for winter supplies were typically located on the walls above these sleeping platforms. Fires were located near the sides, and the central area was used as a passageway. Shed-roof houses were a common design among the Coast Salish in the Puget Sound region (Suttles 1991). This house type easily allowed for the addition of rooms when populations increased, such as during winter months, and for the reduction in house size when occupants left for summer food collection

rounds (Suttles 1991). Often, the different placements of sleeping platforms and individual fires portrayed status, where those with the highest status lived in the back of the house and commoners and slaves lived closer to the entryways (Suttles 1991).

During the spring, summer, and fall, people would journey from central villages to temporary camps. Camps were located along streams during salmon runs while smaller groups would hunt, fish, and gather plant resources. Gathering was most intensive during spring and summer. Plants such as cattail (*Typhaceae* spp.), cranberry (*Oxycoccus* spp.), wapato (*Sagittaria latifolia*), and salmonberry (*Rubus spectabilis*) shoots were collected from wetlands, such as those found along Lake Stickney (located directly west of the project area), and prairies were visited for gathering camas (*Liliaceae* spp.) bulbs (Haeberlin and Gunther 1930; Turner 1976).

A typical summer house was constructed for short-term occupation, and they were typically tipi or square-shaped. Mats were placed horizontally over a frame of poles to create the tipi, while square houses were a lean-to type form, with mats placed over a wooden structure with a gabled or single pitch roof. Short-term occupation mountain camps were made using a similar square form, but covered with boughs of various tree species. Another style of summer house consisted of four corner poles with horizontal poles placed on top to create a gable. Cedar twigs held the framework together, while mats covered the roof and three sides (Haeberlin and Gunther 1930).

The Tulalip Reservation was authorized under the Treaty of Point Elliot in 1855, and enlarged in 1873, as the home for several indigenous groups including the Snohomish, Stillaguamish, Snoqualmie, Skykomish, and other allied bands living in the region (Ruby and Brown 1992; Tulalip Tribes 2014). Some among these groups moved to the reservation, while others remained living on their traditional lands. The combined tribes became known as the Tulalip Tribes.

Cardno is not aware of any known ethnographic place names within the project area or immediately adjacent. However, there are several ethnographic place names recorded in the general vicinity of the project area and near the mouth of the Snohomish River (Waterman 1922; Waterman et al. 2001:336-342). Non-English names are Lushootseed when available.

16 η us η usič (Watermann orthography: *Os³a/s1tc*) translates to “chasing a fish here and there” near an estuary between Steamboat and Union Sloughs.

16a *bəlu η əb* (Watermann orthography: *PE'ls1b*) translates to “boiling,” for an area at the mouth of the main Snohomish River channel.

17 *čik^wucid* (Watermann orthography: *Ctcqo'tsid*) translates to “that which chokes up the mouth of something,” for a small island located on the north side of the Snohomish River mouth.

18 *sex^wčulalq^w* (Watermann orthography: *SExwtculalkw*) is noted for a sharp point of land running toward the Ctcqo'tsid island.

19 *hibu'əb* (Watermann orthography: *Hibu'^βub*) translates to “place where water boils out of the ground,” for a former village site south of the Snohomish River mouth.

20 Watermann orthography: *SEq^wsu³ub* is noted for a small promontory with a slough that runs parallel to the shore.

21 *sluluw#* (Watermann orthography: *SLu'luw1L*) translates to “little perforation for a canoe,” for a narrow channel passing behind an island.

22 *λ'ux^wat* (Watermann orthography: *tL'o'hwaL*) translates to “a cold spring” for a spot on the river bank opposite Everett.

3.3 Historical Context

Cardno referenced GLO land patents and cadastral maps for Township 29 North, Range 5 East as well as Snohomish County atlases and USGS topographic survey maps to determine changes in built environment features (e.g., piers, docks, railroads, buildings, and/or roads) in or near the project area (Table 2). According to the results of a land patent search through the Bureau of Land Management (BLM), in 1876 Dennis Brigham was granted a total of 160.15 acres for Lot/Tract 2, Lot/Tract 3, and Lot/Tract 4 within Section 19 of Township 29 North, Range 5 East. Brigham, a carpenter from Massachusetts, arrived in the Everett area in 1861 to begin the homesteading process. Considered the first permanent settler in the area, Brigham constructed a cabin on his acres near Port Gardner Bay and lived a solitary life (Oakley 2005). During the early 1860s, a lone telegraph operator "...and Brigham were the only settlers between Mukilteo and the mouth of the Snohomish River for many years" (Whitfield 1908: 285). Later, John Auson King claimed Lot/Tract 1, immediately north of Brigham within Section 19 (BLM 1874). These lands grants were authorized under the Land Act of 1820 and the Homestead Act of 1862. These acts reduced the price of federal lands and gave citizens up to 160 acres each of public land for improvement.

Table 2. Results of Cartographic Analysis.

Year	Author/Company	Description of project area
1869	BLM	The project area is located within Section 19, which is partially submerged in Port Gardner Bay. A trail extends along the east bank and connects to a telegraph office and through property homesteaded by "Brigam."
1902	Sanborn Map Co.	Federal Ave extends north through the railroad and ends at the west extent of Everett Ave. Lot/Tract 618 and 619 are labeled, but show no company or ownership. Block 619 contains 30 structures consisting of dwellings with associated outbuildings. Block 618 depicts 11 more structures labelled "Squatters Shacks." Area noted as "marsh."
1910	Anderson Map Co.	Several rail spurs extend west to docks and piers owned by G.N. Ry. Co., N.P. Ry. Co., and Everett Imp. Co. project area is situated west of Everett Ave terminus with railroad and tideland additions (labeled 618 and 619).
1914	Sanborn Map Co.	"Squatters shacks" have been removed from Blocks 618 and 619. Shoreline cuts northeast from intersection of Federal Ave and Everett Ave. Two structures are depicted in the southwest area of Block 618 near the waterline. Area noted as "marsh."
1927	Chas. F. Metsker	Project area is depicted west of main roadways within railroad and dock area of Port Gardner Bay. Sections 20 and 19 are not labeled.
1934	Kroll Map Co.	Project area is noted within an undetailed area heavily utilized by railroad and docks.
1936	Chas. F. Metsker	G.N. Rwy. Depicted east of project area with spurs to "City Dock" and other businesses. North of project area is Clark Nickerson Lbr. Co., and docks to west noted as 13, 14, and 21.
1943	Kroll Map Co.	Same as Kroll (1934).
1950	Sanborn Map Co.	Significant development of Blocks 618 and 619. General Petroleum Corporation, Gilmore Oil Co., and the Associated Oil Company have all constructed warehouses and fuel oil tanks. Within Port Gardner Bay there is a pier (Standard Oil Co.) and an outfitting basin.
1960	Thos. C. Metsker	Federal Street depicted within its current alignment. The project area is noted within property owned by Standard Oil. The block (619 and 618) contains storage tanks.
1960	Kroll Map Co.	Same as previous.

Year	Author/Company	Description of project area
1975	Chas. F. Metsker	Scott Paper Co. is north of the project area. Standard Oil property with storage tanks is located within the project area.
198x	Chas. F. Metsker	Same as previous.
1992	Metsker Maps	Same as previous.

The 1869 survey plat image for Township 26 North, Range 5 East, depicts a telegraph line aligned north-south along the east side of Port Gardner Bay. A “Telegraph Office” is noted south of Section 19. This telegraph line “followed along the beach from Seattle to Whatcom” (Whitfield 1908: 285). In the southeast quarter of Section 19, a small cabin is noted along with the misspelled label of “Brigam” (BLM 1869). In 1890, the Brigham homestead property was purchased by Wyatt and Bethel Rucker with plans to create a townsite called “Port Gardner” (Oakley 2005). During the next year, the Ruckers became associated with Henry Hewitt Jr., Charles L. Colby, and other optimistic landowners and incorporated the Everett Land Company. By 1891, the main thoroughfare called Hewitt Ave was cut east to west and 100 feet wide.

Development of the townsite, now called Everett after Charles Colby’s son, continued with stump removals, street grading, and the sale of Everett Land Company lots (Oakley 2005; Port of Everett 2021). The Everett Land Company won ownership of the waterfront in 1892. In April of 1893, Everett was incorporated and boasted more than 5,600 citizens supported by streetlights, streetcars, sawmills, railroads, and residential and commercial expansion. However, the Panic of 1893 led to a withdrawal of investments and money in the Everett Land Company. The holdings of the Everett Land Company were transferred to the Everett Improvement Company in 1899 (Oakley 2005).

Evidence of development revitalization is visible in a 1902 map in the numerous land lots divided and numbered to the East Waterway shoreline of Port Gardner Bay (Figure 4; Sanborn Map Co. 1902). Federal Ave extended north through the Great Northern Coast Line and terminated at the westerly extent of Everett Ave. At this time, no company or business name was noted on the Sanborn Fire Insurance Map within the project area. Within properties directly north of the project area, large structures are depicted for the Everett Flour Mill Co. and the Clark Nickerson Lumber Co.

The color-coded key indicates that within Block 619 within the project area, structures consisted of “frame building” (Sanborn Map Co. 1902). The detailed map page for Block 619 contains 30 frame structures, all dwellings and associated outbuildings, situated around a marshland at the center of the block (Figure 5). Within each dwelling, the maps include a notation of “S.P.,” which is specially called out on the key map introduction: “NOTE Practically all dwellings with a “S.P.” (Stove pipe) are cheap, unpainted shacks” (Sanborn Map Co. 1902: Key Map). Eleven additional “S.P.” buildings consisting of dwellings, outbuildings, bath house, and boat house, are depicted within Block 618 to the north of the project area, and noted as “Squatters Shacks” (Sanborn Map Co. 1902).

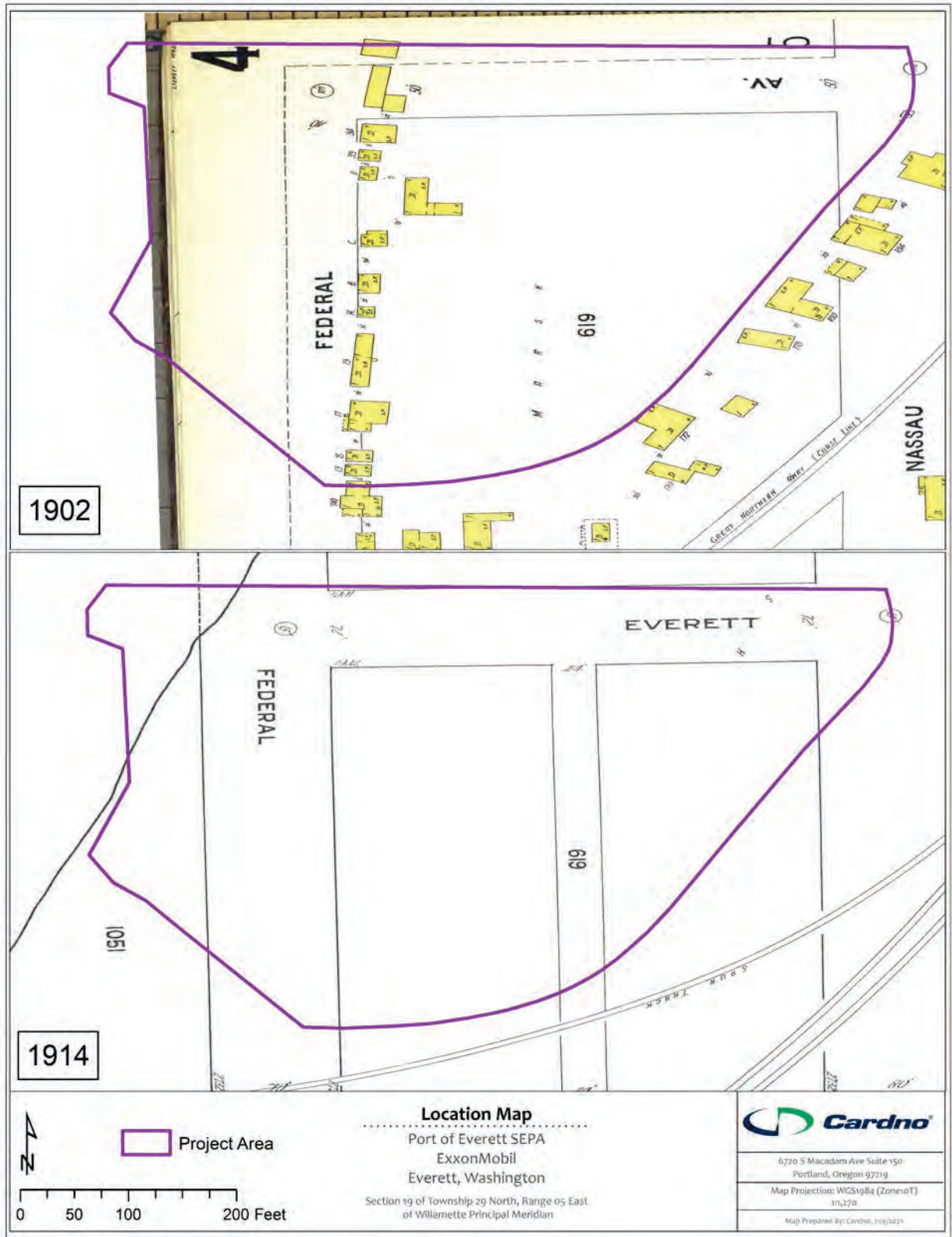


Figure 4. Details from 1902 and 1914 Sanborn Fire Insurance Maps (Sanborn Map Co. 1902, 1914).

Historical maps illustrate a changed landscape. In 1910, railway spurs extended west from the mainline to docks and piers owned by “G.N.Ry.Co.,” “N.P.Ry.Co.,” and “Everett Imp. Co.”:

“G.N.Ry.Co.” – Great Northern Railway

“N.P.RY.Co.” – Northern Pacific Railway

“Everett Imp. Co.” – Everett Improvement Company

By 1914 the “squatters shacks” north of the project area had been removed, and increasing development of piers and docks is evident (see Figure 4; Anderson Map Co. 1910; Sanborn Map Co. 1914). The position of the site between the railroad and waterfront was highly conducive to industrial uses. Between 1914 and 1950, the east shoreline of Port Gardner Bay was significantly filled and artificially extended into the East Waterway. Additionally, docks and piers expanded the industrial and commercial landscape west of the historical extent of Federal Ave (Sanborn Map Co. 1950).

By 1925, the northern part of the project area contained at least two large “General Petroleum Corporation” tanks, three smaller unlabeled tanks, and three gable-roof outbuildings just south of Everett Avenue. The project area spans Federal Avenue, across which was one large “General Petroleum Corporation” warehouse complex near the shoreline. Predecessors of ExxonMobil, owned the project area site beginning in 1927 (Washington Department of Ecology 2021).

The warehouse complex contained automobile truck storage, an oil and grease warehouse, a wash rack room, a boiler room, and an oil in steel drum staging yard adjacent to a wooden bulkhead (Figure 5; Sanborn Map Co. 1939 [Revised through June 1955]). By 1947 development within the project area had been expanded significantly to the south (Figure 6). Additional infrastructure constructed included several cylindrical petroleum tanks each containing 25,000 gallons of gasoline, eight outbuildings including a wooden office building, pump room, and warehouses, and a steel filling rack (Figures 5, 7, and 8; Sanborn Map Co. 1939 [Revised through June 1955]). The shoreline has not been modified with fill since approximately 1950 (Figure 9). An Everett USGS map from 1953 shows the area developed with gasoline tanks and a pier directly adjacent to the company warehouse complex (Figure 10). It does not appear the eastern portion of the project area was ever significantly developed.

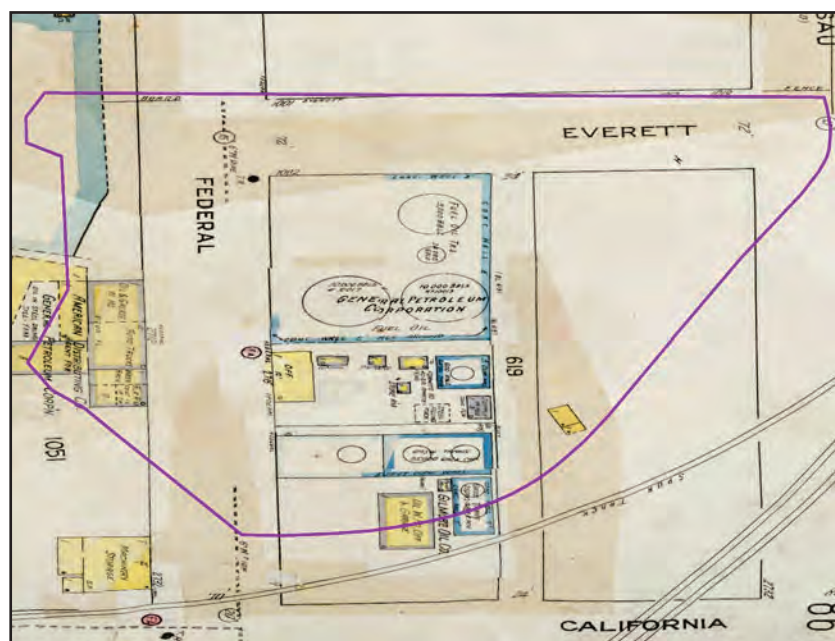


Figure 5. Project area displayed on 1939 Sanborn Fire Insurance Map. (Sanborn Map Co. 1939 [Revised through June 1955])



Figure 6. Project Area depicted on aerial imagery from 1947 (Image courtesy of ExxonMobil 2021).



Figure 7. Photograph of project area viewed facing north, taken from south end of site (Washington Department of Ecology 2021).



Figure 8. Undated photograph showing gasoline infrastructure after General Petroleum Corporation was rebranded to Mobilgas. The office building on the site is at the right. (Washington Department of Ecology 2014:65)

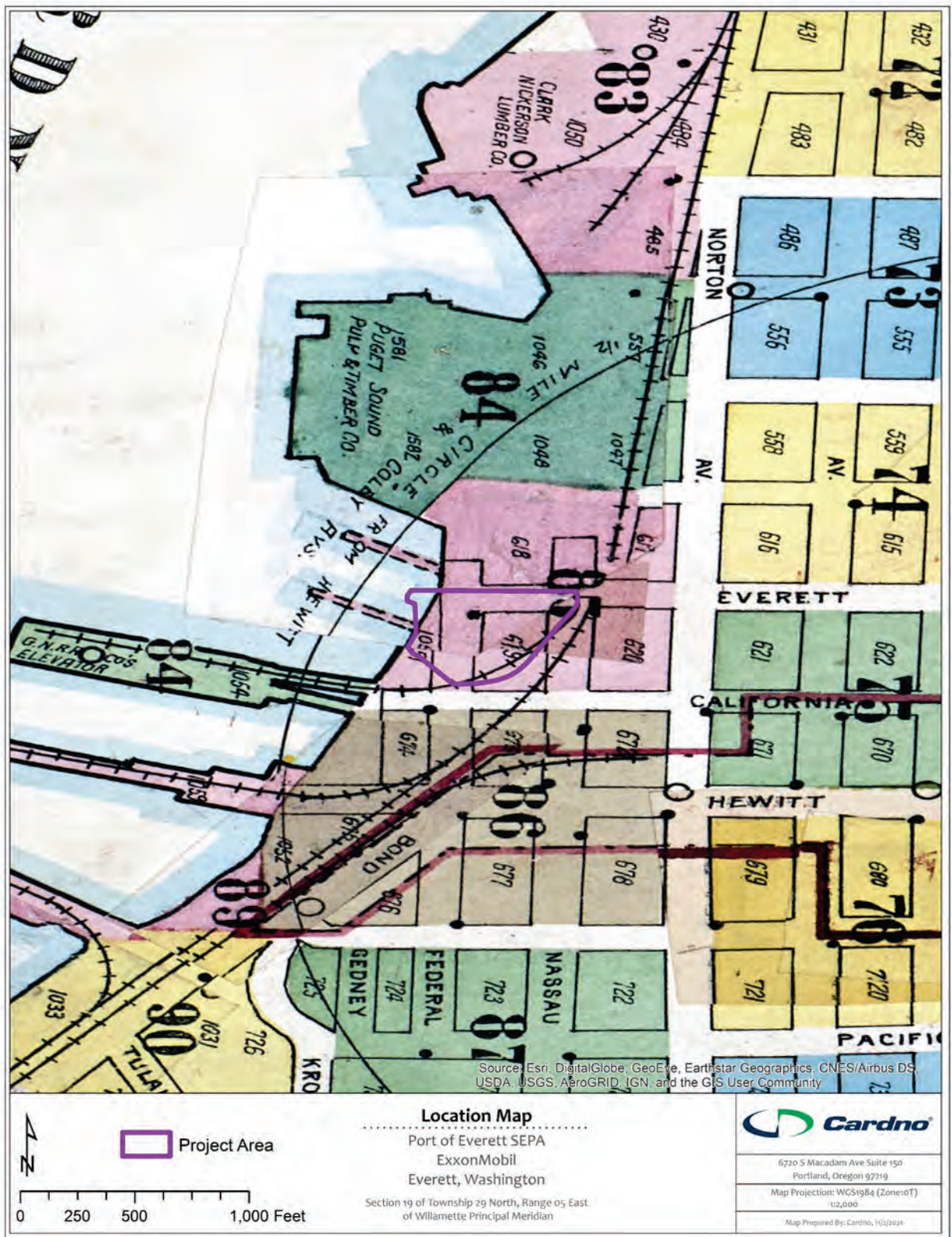


Figure 9. Project Area depicted on 1950 Sanborn Insurance Map (Sanborn Map Co. 1950).

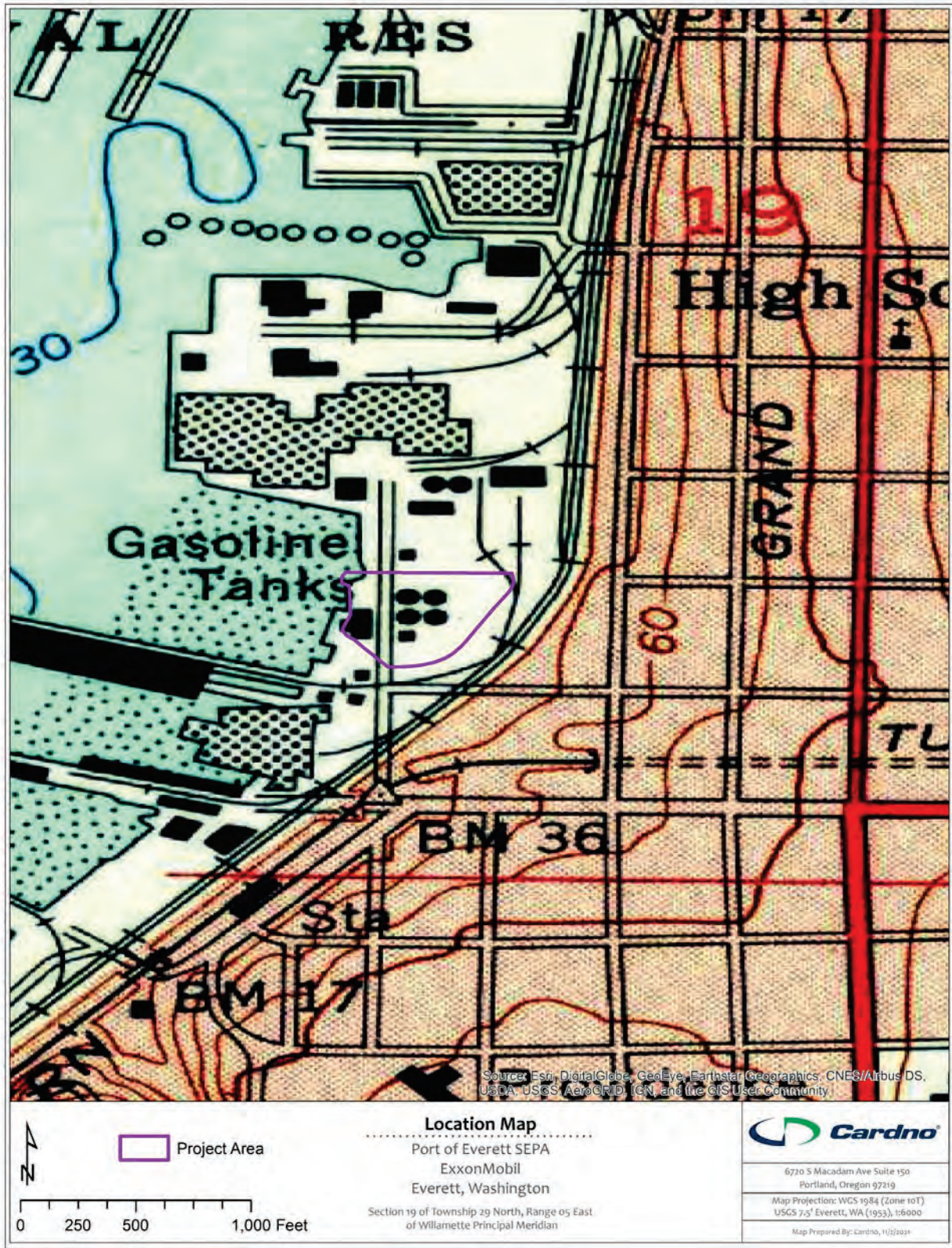


Figure 10. Project area depicted on the 1953 Everett USGS 7.5-minute quadrangle (USGS 1953).

In 1974, Mobil Oil sold the northern part of the project area to A.P. Miller for use by the American Distributing Company (ADC) who continued petroleum operations until 1990 (Washington Department of Ecology 2021). By 1977 the warehouse complex across Federal Avenue and the office building had been demolished (Figure 11). Mobil Oil ceased petroleum operations on the project area in 1987. All remaining infrastructure at the site was demolished between 1998 and 2002, and the project area was used as a parking lot (Washington Department of Ecology 2021). In late 2003 Terminal Avenue was developed adjacent to the site. The project area experienced continued development and change over several years precluding the identification of a particular year or period of importance of the petroleum infrastructure which was once extant.



Figure 11. A 1977 aerial photograph of the project area (Washington Department of Ecology 2021).

3.1 Literature Review

Cardno archaeologists conducted a background search and literature review of existing cultural resource records; local, state, and national register nomination forms; previous cultural resources investigations; and any known or potential TCPs in and within 1.0 mile (1.6 km) of the project area. According to the DAHP's predictive model available on the WISAARD online database, there is a very high risk of encountering buried precontact archaeological deposits in the project area.

3.1.1 Previous Investigations

The background search identified 15 cultural resources investigations that have been previously conducted within 1.0 mile (1.6 km) of the current project between 1975 and 2020 (Table 3). Seven investigations were surveys, two involved construction monitoring, two were historic structures surveys, three provided larger prehistoric and historic context for the area, and one was a monitoring and discovery plan. Recently, four cultural resources investigations fall within or immediately adjacent to the project area, as plotted by WISAARD (see Table 3): Johnson 2000; Rinck et al. 2013; Udem et al. 2014; Johnson 2020.

Table 3. Cultural Resources Investigations within 1.0 Mile of the project area (n = 15).

Year	Author	Report Title	NADB Number	Report Type	Location Relative to project area
1975	Dunell and Fuller	An Archaeological Survey of Everett Harbor and the Lower Snohomish Estuary-Delta	1332098	Survey Report	project area within Study Area
1987	Blukis Onat	Resource Protection Planning Process Identification of Prehistoric Archaeological Resources in the Northern Puget Sound Study-Unit	1349367	Overview	Overview of Area
1988	Evans-Hamilton, Inc.	The Location, Identification and Evaluation of Potential Submerged Cultural Resources in Three Puget Sound Dredged Material Disposal Sites	1340504	Survey Report	0.84 mile west
1991	Miss and Campbell	Prehistoric Cultural Resources of Snohomish County, Washington	1334282	Overview	Overview of Area
1998	Demuth	Technical Report: Historic, Cultural, and Archaeological Resources Assessment for Everett-to-Seattle Commuter Rail Project Environmental Impact Statement	1340269	Overview	Overview of Area
2000	Johnson	Letter to Molly Adolfson Regarding Proposed California Street Overpass, Everett	1344193	Survey Report	Within project area
2006	Juell	Archaeological Site Assessment of Sound Transit's Sounder: Everett to Seattle Commuter Rail System, King and Snohomish Counties	1348189	Survey Report	0.38 mile south
2008	Hartmann	Cultural Resources Assessment for the Swift Bus Rapid Transit Project	1351380	Survey Report	0.54 mile southeast
2011	Lenz et al.	Cultural Resources Assessment for the Broadway Bridge Replacement Project, Everett	1682948	Survey Report	0.68 mile west
2013	Pinyerd	Downtown Everett #SE03XC527 1602 Hewitt Ave., Everett	1683379	Historic Structures Survey Report	0.37 mile southeast
2013	Rinck	Cultural Resources Monitoring and Discovery Plan for the Kimberly-Clark Worldwide Site Upland Area, Everett	NA	Monitoring and Discovery Plan	0.11 mile north
2013	Rinck et al.	Archaeological Resources Assessment for the Kimberly-Clark Worldwide Site Upland Area, Everett	NA	Survey Report	0.06 mile north

Table 3. Cultural Resources Investigations within 1.0 Mile of the project area (n = 15).

Year	Author	Report Title	NADB Number	Report Type	Location Relative to project area
2014	Udem et al.	Letter to Steve Germiot RE: Results of Cultural Resources Monitoring at the Kimberly-Clark Worldwide Site Upland Area, Everett	1685767	Monitoring Report	0.11 mile north
2014	Sackett	Architectural Survey and Evaluation: Naval Station Everett	1685545	Historic Structures Survey Report	0.47 mile west
2020	Johnson	FINAL Results of Archaeological Monitoring for the Kimberly-Clark Everett Interim Action	1694736	Monitoring Report	0.07 mile north

In 2000, Paragon Research Associates conducted a survey for roadway connector alternatives between Everett Ave that would impact “Maggie’s Park” (Johnson 2000). Maggie’s Park, located approximately 400 feet east of the project area, is located within the Brigham land claim and possibly near the location of the original cabin. However, no archaeological materials have been identified to confirm this claim. Johnson conducted a pedestrian survey and identified no cultural materials.

In 2013, SWCA Environmental Consultants (SWCA) conducted an extensive study and background review for the Kimberly-Clark Worldwide Site Upland Area SEPA process (Rinck et al. 2013). This project area is located within 56 acres of upland lands and 12 acres of tidelands within the north parcel immediately adjacent to the current project area. Previously, this area was utilized as for industrial purposes which has contaminated the area. The first mill within this project area was the Robinson ad Company Mill, which began operations in the early 1890s. By 1901, this area contained an extensive sawmill and planning facility for the Clark-Nickerson Lumber Company. During the background review, SWCA identified the project area as containing a high potential for precontact and historical cultural materials within the natural Port Gardner shoreline. In response to the potential for buried archaeological materials, SWCA developed a site-specific Monitoring and Discovery Plan (MDP) (Rinck 2013).

SWCA performed archaeological monitoring for cleanup excavations at the Kimberly-Clark Worldwide Site Upland Area (Udem et al. 2014). Within one area, excavations intersected natural sediments underlying historic-period fill. Within Location 11, archaeologists observed miscellaneous historic debris and architectural remnants located between 2 and 6 feet below ground surface. One precontact artifact was documented during monitoring—45SN00629, an edge-altered basalt cobble (Udem 2014).

Archaeological monitoring continued at the Kimberly-Clark Worldwide Site Upland Area in 2020 (Johnson 2020). Archaeologists observed architectural and structural debris within the historic fill layer, likely associated with historical mill operations. No precontact materials or intact sediment layers were observed.

3.1.2 Archaeological Resources

One archaeological resource is recorded within a 1.0-mile (1.6-km) radius of the project area. The archaeological resource (45SN00629) is a precontact isolated find identified within historic dredge material underneath a parking lot (Udem 2014; Udem et al. 2014). Historically, the property was the location of a mill situated at 2600 Federal Avenue (Boswell and Sharley 2012). The single lithic artifact was recorded as an edge-altered basalt cobble with 13 multidirectional flake scars on one end. The artifact was donated to the Hibulb Cultural Center (Johnson 2020).

3.1.3 Built Environment

No historic properties listed in the NRHP, WHR, and/or ERHP are located within or immediately adjacent to the project area. Twelve properties listed in the NRHP are located within 1.0 mile (1.6 km) of the project area (Table 4). Additionally, two historic districts are located within 0.5 mile (0.8 km) of the project area: Hewitt Ave Historic District (45DT00231) and Rucker Hill Historic District (45DT00155). Four properties are listed in the WHR. Twenty-seven properties are listed on the ERHP, and all three Everett historic overlay districts begin within one mile of the site. Several properties are listed on more than one register. The dates of significance for the historic properties range from 1892 to 1967. There are no properties listed on the Snohomish County Register of Historic Places within one mile of the project area.

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Roland & Nina Hartley House/Hartley Mansion (45SN00337)	2320 Rucker Ave	1910	Listing No. 86000958; Resource ID 676163 WHR, NRHP	Lambert	1986	0.37 mile northeast
Everett High School (45SN00351)	2400 Colby Ave	1910	Listing No. 97000493; Resource ID 676177 WHR, NRHP	Ravetz	1996	0.35 mile northeast
Everett Public Library (45SN00341)	2702 Hoyt Ave	1934	Resource ID 676167 WHR	Dilgard	1989a	0.27 mile east
Knights of Columbus Community Center and War Memorial Building (45SN00132)	1611 Everett Ave	1921	Listing No. 79002554; Resource ID 676151 WHR, NRHP	Potter	1975c	0.40 mile east
Pioneer Block – Everett (45SN00127)	2814-2816 Rucker	1892	Resource ID 676145 WHR	Lambert	1979	0.23 mile southeast
Marion Building, Hotel Marion, Tontine Saloon (45SN00128)	1401 Hewitt Ave	1895	Resource ID 676146 WHR	Dilgard	1979	0.27 mile southeast
Everett Theatre (45SN00115)	2911 Colby Ave	1901; 1924	Resource ID 676133 WHR	Potter	1975a	0.41 mile southeast
Monte Cristo Hotel (45SN00117)	1507 Wall Street	1925	Listing No. 76001907; Resource ID 676135 WHR, NRHP	Potter	1975b	0.39 mile southeast

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
U.S. Post Office and Customs House (45SN00135)	3006 Colby Ave	1917	Listing No. 76001909; Resource ID 676154 WHR, NRHP	Potter	1975d	0.43 mile southeast
Everett City Hall (45SN00344)	3002 Wetmore Ave	1929	Listing No. 90000674; Resource ID 676170 WHR, NRHP	Dilgard	1989b	0.48 mile southeast
Snohomish County Courthouse (45SN00116)	3000 Rockefeller Ave	1910; 1967	Listing No. 75001870; Resource ID 676134 WHR, NRHP	Potter	1975e	0.56 mile southeast
Everett Carnegie Library/Cassidy Funeral Home (45SN00133)	3001 Oakes Ave	1904; 1905	Listing No. 75001868; Resource ID 676152 WHR, NRHP	Potter	1975f	0.62 mile southeast
Commerce Building (45SN00345)	1801 Hewitt Ave	1910	Listing No. 92001290; Resource ID 676171 ERHP, WHR, NRHP	Sullivan	1992	0.52 mile east
Everett Fire Station No. 2 (45SN00342)	2801 Oakes Ave	1925	Listing No. 90000673; Resource ID 676168 WHR, NRHP	Dilgard	1989c	0.57 mile east
Rucker House (45SN00134)	412 Laurel Dr	1901	Listing No. 75001869; Resource ID 676153 WHR, NRHP	Potter	1975g	0.62 mile southwest
Hewitt Avenue Historic District (45DT00231)	1620 - 1915 Hewitt Avenue and portions of Wetmore, Rockefeller, Oakes, and Lombard Avenues	1894–1959	Listing No. 10001020; Resource ID 674762 WHR, NRHP	Fürész	2010	0.44 mile east
Rucker Hill Historic District (45DT00155)	Laurel, Snohomish, Niles, Warren, Bell, Tulalip, 33rd and 34th	1905–1930	Listing No. 89000399; Resource ID 674698 WHR, NRHP	Ravetz	1988	0.45 mile southwest

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Rucker-Grand Historic Overlay Zone	Rucker and Grand Avenues between 10th and 24th Streets		N/A ERHP			0.37 mile northeast
Norton-Grand Historic Overlay District	Norton and Grand Avenues between Pacific Avenue and 3612 Norton Avenue		N/A ERHP			0.34 mile south
Riverside Historic Overlay District	N/A	Established 2008	N/A ERHP			0.88 mile east
Fratt Mansion (45SN00680)	1725 Grand Ave	1904	Listing No. 100000991 Resource ID 678273 ERHP, WHR, NRHP	Cope & Gillette	2017	0.91 mile northeast
Sittig House	1927 Rucker Ave	1893	N/A ERHP	O'Donnell	2018	0.75 mile northeast
Cleaver Clough House	2031 Grand Ave	1907	N/A ERHP			0.64 mile northeast
Hilzinger House	2108 Rucker Ave	1907	N/A ERHP			0.63 mile northeast
Wright House	2112 Rucker Ave	1905	N/A ERHP			0.61 mile northeast
Blackman House	2208 Rucker Ave	1910	N/A ERHP			0.54 mile northeast
Austin House	2201 Rucker Ave	1897-1900	N/A ERHP			0.57 mile northeast
Agnew House	2301 Rucker Ave	1899	N/A ERHP			0.49 mile northeast
Krieger Laundry	2808 Hoyt Ave	1915	N/A ERHP			0.3 mile southeast
Walsh Platt/Fisher Motors Building	2902 Rucker Ave	1930	N/A ERHP			0.27 mile southeast
Everett Downtown Storage	3001 Rucker Ave	1919	N/A ERHP			0.36 mile southeast
Howard House	3410 Snohomish Ave	1912	N/A ERHP			0.69 mile southwest
Jackson House	3602 Oakes Ave	1906	N/A ERHP			0.97 mile southeast
Culmback Building	3013 Colby Ave	1924	N/A ERHP			0.48 mile southeast

Table 4. NRHP/WHR/ERHP-Listed Properties Located within 1.0 Mile of the project area (n = 33).

Property Name	Address	Date Built	Property/Inventory No./Resource ID	Author	Year	Location Relative to project area
Port Gardner Building	2802 Wetmore Ave	1929	N/A ERHP			0.43 mile east
Bank of Everett (Cope Gillette Theatre)	2703 Wetmore Ave	1963	N/A ERHP			0.44 mile east
Challacombe & Fickel Building	2727 Oakes Ave	1923	N/A ERHP			0.59 mile east
Evergreen Building	1909 Hewitt Ave	1902	N/A ERHP			0.62 mile southeast
Watson's Bakery	1812 Hewitt Ave	1910	N/A ERHP			0.57 mile southeast
Morrow Building	2823 Rockefeller Ave	1925	N/A ERHP			0.54 mile southeast
Van Valey House	2130 Colby Ave	1914	N/A ERHP			0.64 mile northeast
Sahlinger-Muck	2319 Colby Ave	1908	N/A ERHP			0.56 mile northeast
Clark Park	2400 Lombard Ave	1894	N/A ERHP			0.66 mile northeast
Ray Fosheim House	2017 26 th St	1892	N/A ERHP			0.7 mile northeast
Lettelier House	2510 Baker Ave	1908	N/A ERHP			0.98 mile northeast

Three historic properties located within 0.5 mile (0.8 km) of the project area have been recommended and determined eligible for listing in the NRHP and/or WHR (Table 5). The Kimberly-Clark Everett Mill Main Office (Property ID 667716) is within 0.09 miles of the project area. The building was originally constructed in 1929 and consisted of a two-story Neoclassical rectangular structure with red brick cladding and low-pitched hipped roof. The building has a projecting Classical portico and round, white-painted Tuscan columns. In the 1940s and 1950s, the building underwent several alterations including the addition of two dormers on the roof, an addition to the south elevation of the building, the addition of a poured concrete deck and steps, and window replacements. The building is recommended as eligible for listing in the NRHP under Criterion A and listing in the WHR based on its historical association with the industrial development of Everett (Sharley 2012). All other listed and eligible properties are separated from the project area by the BNSF Railway train tracks. Most listed properties within one mile of the project area are clustered in areas to the east and to the north-northeast.

Table 5. Properties Recommended Eligible Located within 0.5 Mile of project area (n = 3)

Property Name	Address	Date Built	Property ID/ Resource ID	Author	Year	Location Relative to project area
Kimberly-Clark Everett Mill Main Office	2600 Federal Ave	1929	Property ID 667716; Resource ID 614724	Sharley	2012	0.09 mile north
Daulph Delicatessen	1416 Hewitt Ave	1927	Property ID 18268; Resource ID 12597	Dilgard and Riddle	1989	0.33 mile east
Everett Main Post Office	3102 Hoyt Ave	1964	Property ID 270916	Richards	2014	0.44 mile southeast

3.1.4 Cemeteries and Burials

According to information provided on the DAHP's WISAARD, there are no historic or precontact burials located within 1.0 mile (1.6 km) of the project area. One historic columbarium is located approximately 0.47-mile northeast of the project area (DAHP 2009). The Trinity Episcopal Church Columbarium (45SN00555) is situated at 2301 Hoyt Ave. The church was dedicated in 1921 with a new parish hall constructed in 1961 (Trinity Episcopal Church 2019). No further information is provided regarding the columbarium.

3.2 Cultural Resources Summary

Archival research indicates a high level of human activity took place adjacent to the project area during precontact and historic times. Given the history of the project area and its immediate vicinity, Cardno concludes that the potential for encountering subsurface archaeological deposits beneath the historic fill layers is moderate to high. Historical land modification, including the introduction of artificial fill and development, reduces the likelihood of encountering in situ precontact artifacts. Ethnographic-period archaeological deposits within and adjacent to the project area may include disturbed or redeposited midden deposits, burials, evidence of a village, or debris associated with short-term occupations and resource-processing locations. Historic-period deposits may include debris from agricultural and historic homestead structures and other early-twentieth-century structure (i.e., "squatters shacks"), or from manufacturing or commercial development.

4.0 Recommendations

Cardno recommends that a monitoring and inadvertent discovery plan (MIDP) be implemented to minimize potential impacts to any currently unknown intact archaeological resources. Monitoring should not be necessary in glacial deposits and sediments, nor in existing areas where disturbance has already occurred.

Cardno recommends that the MIDP outline the necessary steps to be taken by contractors in the event of an inadvertent discovery during construction. These steps would serve to minimize damage to any inadvertently discovered archaeological resources during ground-disturbing activities, which may include small, deeply buried, and/or widely dispersed historic or precontact cultural materials (e.g., railroad grade, rails, ties, stakes, and footings; glass bottles; sanitary cans; chipped-stone tools; ground stone; beads; shell; faunal remains; human remains; funerary objects; and objects of cultural patrimony).

Steps included in the MIDP would outline the applicable local laws and regulations, stop-work and notification protocols, discovery protection measures, procedures for assessment by archaeologists, and steps for consultation with the DAHP and any affected Indian tribes. In the state of Washington, archaeological sites are protected from knowing disturbance on both public and private lands. As described in Section 2, RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the DAHP before excavating, removing, or altering Native American human remains or archaeological resources in Washington. A failure to obtain a permit is punishable by civil fines and penalties under RCW 27.53.095 and criminal prosecution under RCW 27.53.090.

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About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm

Cardno
**ZERO
HARM**
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

APPENDIX H

Terrestrial Ecological Evaluation Form





Voluntary Cleanup Program

Washington State Department of Ecology Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Terrestrial-ecological-evaluation>.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.

Facility/Site Name: ExxonMobil ADC

Facility/Site Address: 2717/2731 Federal Avenue, Everett, Washington 98201

Facility/Site No: 2728

VCP Project No.: N/A

Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.

Name: Bobby Thompson

Title: Project Manager

Organization: Stantec

Mailing address: 720 Third Avenue, Suite 1500

City: Seattle

State: WA

Zip code: 98104

Phone: (208) 761-1557

Fax: N/A

E-mail: robert.thompson@stantec.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

- Yes *If you answered "YES," then answer **Question 2**.*
- No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? Check all that apply. Then skip to **Step 4** of this form.

Point of Compliance: WAC 173-340-7491(1)(a)

- All soil contamination is, or will be,* at least 15 feet below the surface.
- All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

- All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

- There is less than 0.25 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.
- For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous# undeveloped± land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

- Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

± "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

"Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 2** below.*
- No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

- Yes *If you answered "YES," then answer **Question 3** below.*
- No *If you answered "NO," then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

- Yes *If you answered "YES," then answer **Question 4** below.*
- No *If you answered "NO," then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

- Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*
- Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? Check all that apply. Then skip to **Step 4** of this form.

Exposure Analysis: WAC 173-340-7492(2)(a)

- Area of soil contamination at the Site is not more than 350 square feet.
- Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

- No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.
- No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. See WAC 173-340-7493(1)(c).

1. Was there a problem? See WAC 173-340-7493(2).

- Yes *If you answered "YES," then answer **Question 2** below .*
- No *If you answered "NO," then identify the reason here and then skip to **Question 5** below :*
- No issues were identified during the problem formulation step.
 - While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? See WAC 173-340-7493(3).

- Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below .*
- Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below .*

3. If you conducted further site-specific evaluations, what methods did you use?

Check all that apply. See WAC 173-340-7493(3).

- Literature surveys.
- Soil bioassays.
- Wildlife exposure model.
- Biomarkers.
- Site-specific field studies.
- Weight of evidence.
- Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

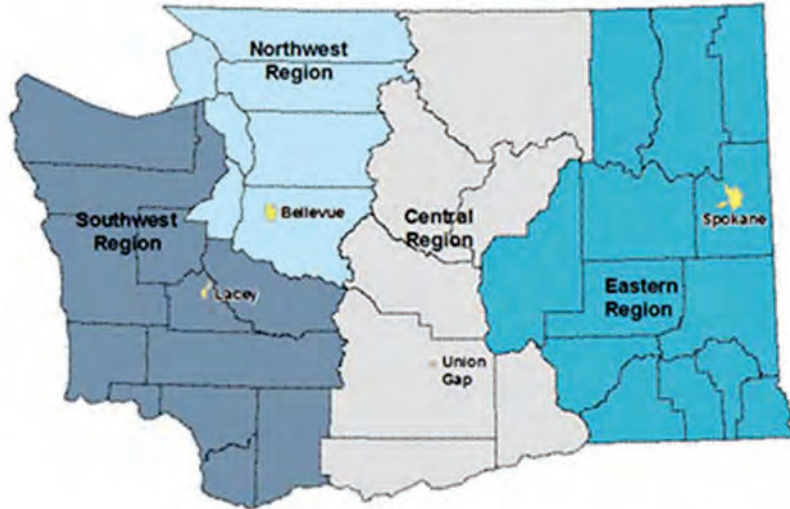
- Confirmed there was no problem.
- Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

- Yes *If so, please identify the Ecology staff who approved those steps:*
- No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160 th Ave. SE Bellevue, WA 98008-5452	Central Region: Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	Eastern Region: Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

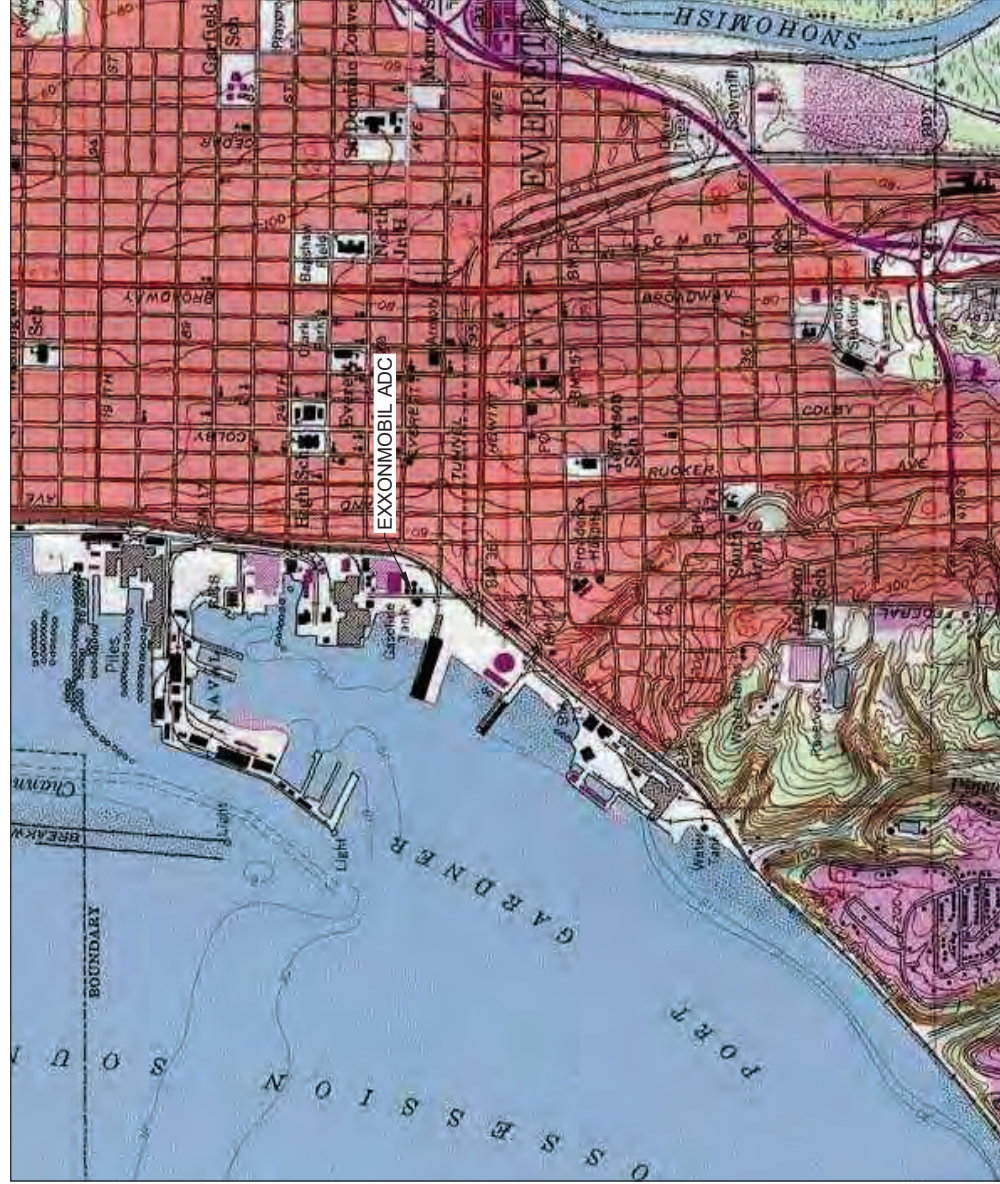
If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call 877-833-6341.

APPENDIX I

Site Plans



EXXONMOBIL ADC REMEDIAL EXCAVATION EVERETT, WASHINGTON



DRAWING LIST:

- Sheet 1: TITLE SHEET
- Sheet 2: P-1 PROJECT AREA PLAN
- Sheet 3: P-2 PROJECT AREA PLAN WITH UTILITIES
- Sheet 4: P-3 EXAMPLE STAGING PLAN
- Sheet 5: C-1 EXCAVATION PLAN
- Sheet 6: C-2 EXCAVATION SECTION
- Sheet 7: C-3 BACKFILL SECTION
- Sheet 8: C-4 PAVING PLAN

SCOPE OF WORK:

Excavate and remove approximately 17,500 cubic yards of material to a depth of 20 feet below ground surface (bgs), with the water table at a depth of approximately 5 feet bgs. Backfill and restore surface following excavation.

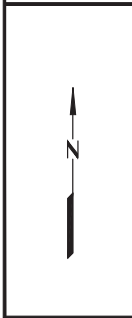
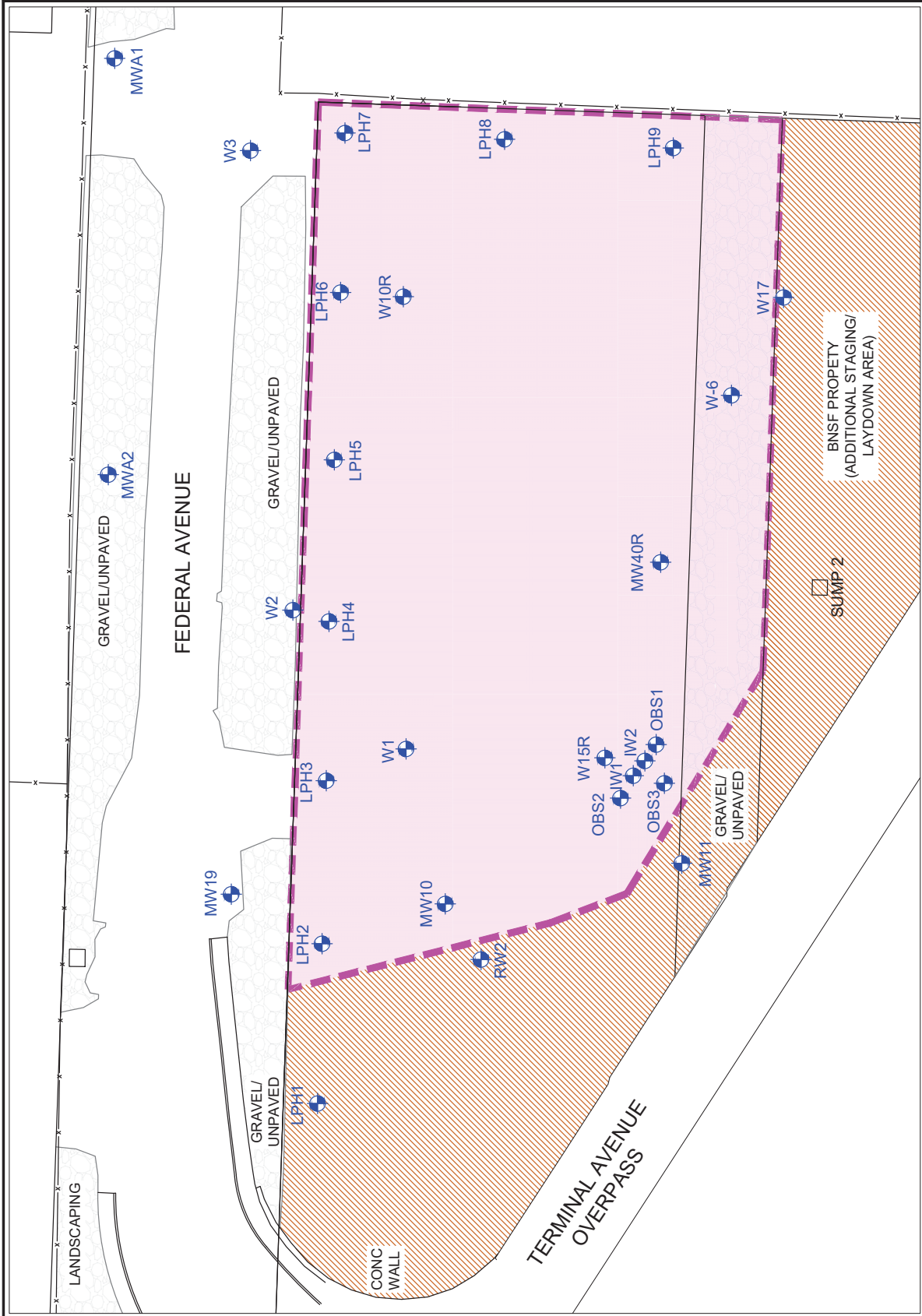


PROJECT NO.	203722941
DATE	05/16/23
DRAWN	LANA ODLE
APPROVED	BOBBY THOMPSON

NO.	DATE	REVISIONS
1	05/16/23	

DRAWING	TITLE SHEET
SCALE:	1" = 60'

PROJECT NO.	203722941	DRAWING	TITLE SHEET
DATE	05/16/23	DRAWN	LANA ODLE
APPROVED	BOBBY THOMPSON	APPROVED	BOBBY THOMPSON
REMEDIAL EXCAVATION EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington		Sheet 1 	



EXPLANATION

MWA3	Groundwater Monitoring Well
GB9	Geotechnical Soil Boring
	Excavation Extents
	Additional Staging/Laydown Area

NOTES

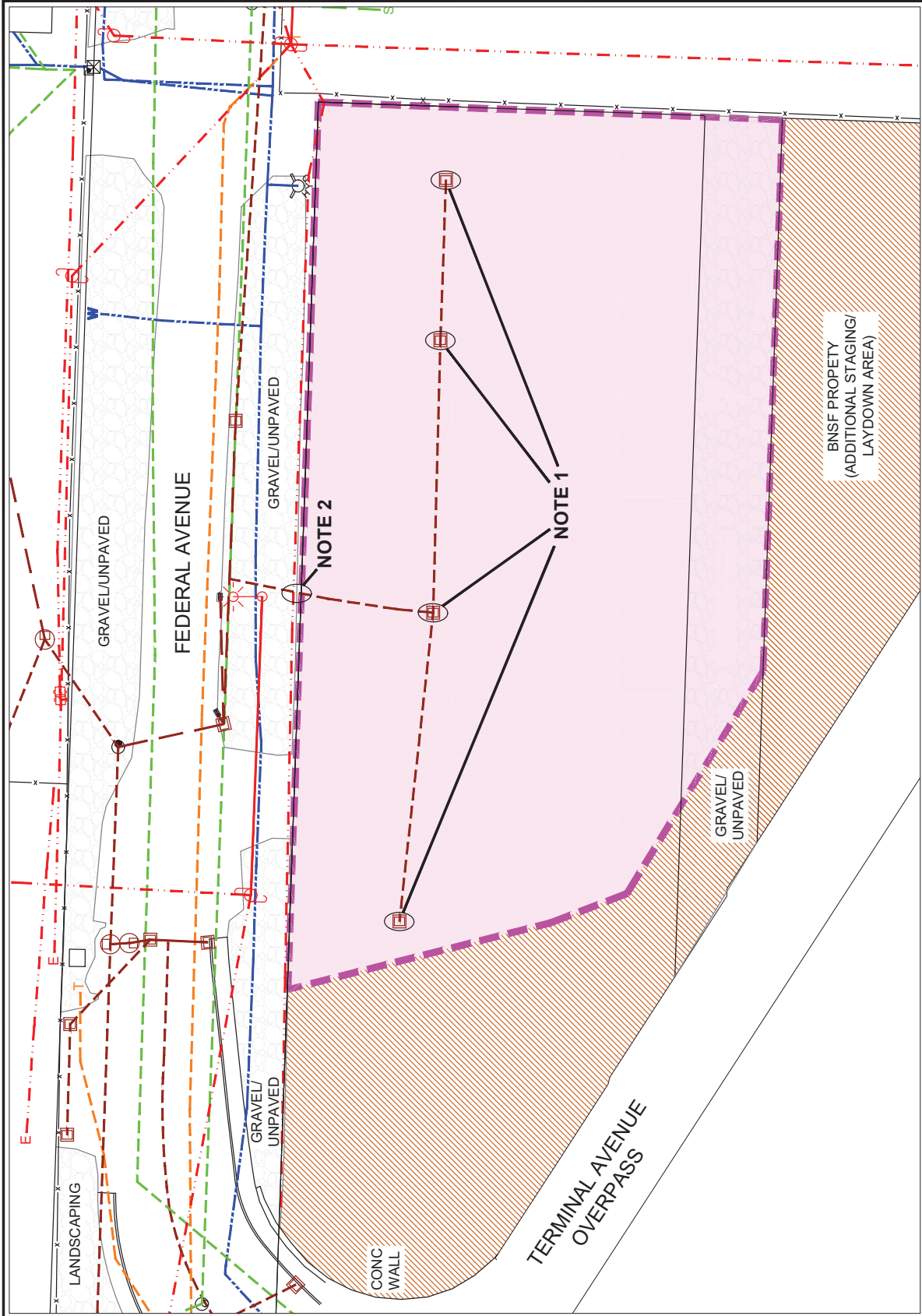
- STANTEC TO CONTRACT THE DECOMMISSIONING OF ALL MONITORING WELLS LOCATED WITHIN THE FOOTPRINT OF THE EXCAVATION OR SHORING WALL PRIOR TO PROJECT EXECUTION.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO.	203722941
FN	203722941-RPP
LAST REV. DATE:	05/22/23
DATE	05/22/23
DRIVER:	LANA COLE
APPROVED:	BOBBY THOMPSON

DRRAWING	3
REVISIONS	2
NO.	1
DATE	05/22/23



PROJECT NO. **203722941**

DATE: 05/22/23

LAST REV. DATE: 05/22/23

DATE: 05/22/23

DRIVER: LANA COLE

APPROVED: BOBBY THOMPSON

REVISIONS

NO.	DATE	REVISIONS
1	05/22/23	
2		
3		

SCALE: 1" = 40'

DRAINAGE

P-2

Sheet 3

PROJECT AREA PLAN WITH UTILITIES

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

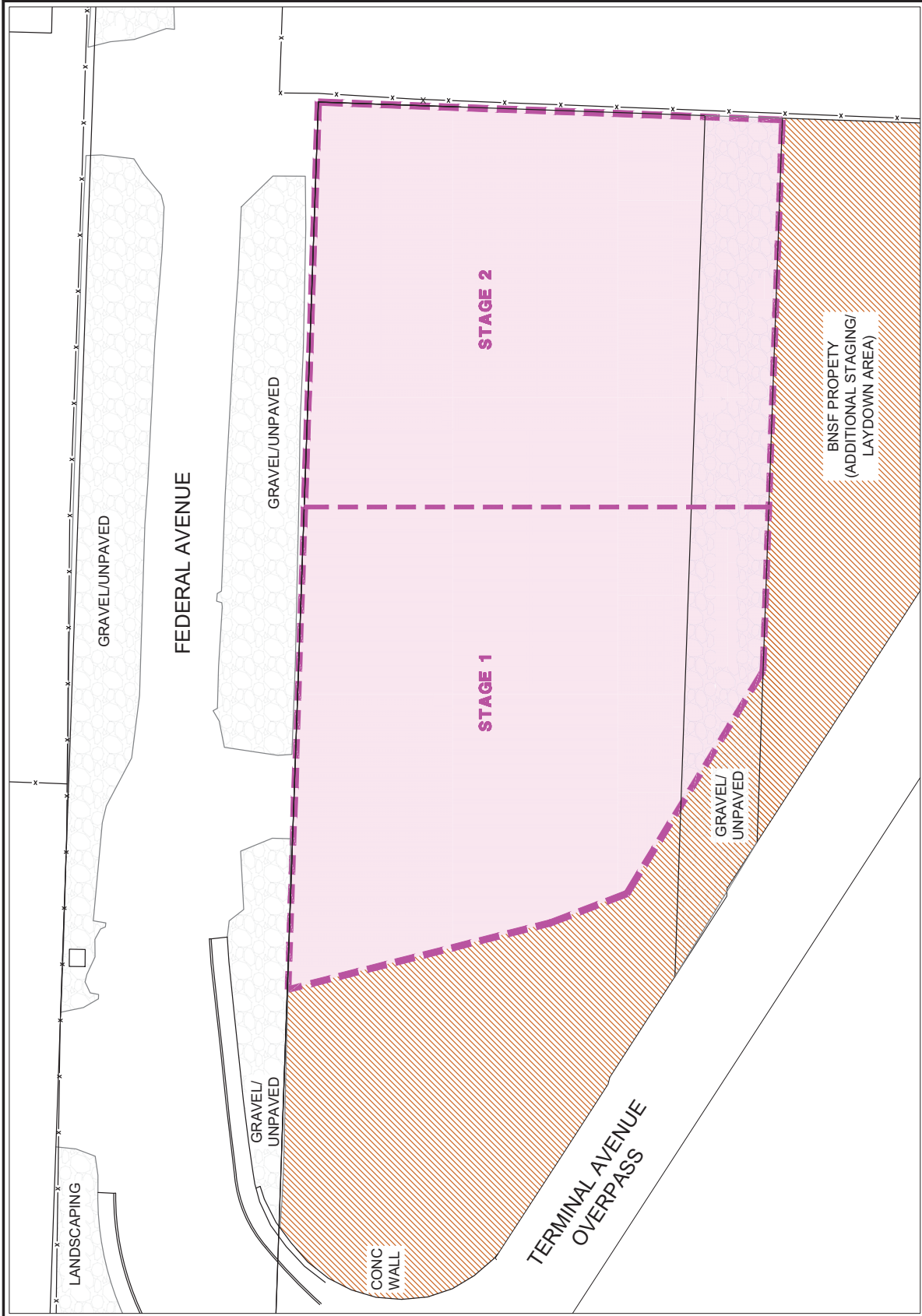
Stantec

SOURCE: Modified by maps provided by ASP1, LLC

APPROXIMATE SCALE

CONTRACTOR TO REMOVE FOUR (4) STORM DRAINS LOCATED WITHIN THE EXCAVATION FOOTPRINT FOR PROJECT EXCAVATION AND REPLACE FOUR (4) STORM DRAINS UPON COMPLETION OF PROJECT.

CONTRACTOR TO CAP ONE 15-INCH STORM LINE FOR PROJECT EXECUTION AND RECONNECT UPON COMPLETION OF PROJECT.



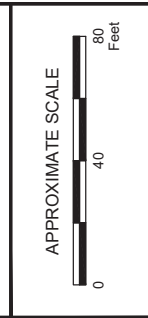
EXPLANATION

- Excavation Extents
- Additional Staging/Laydown Area

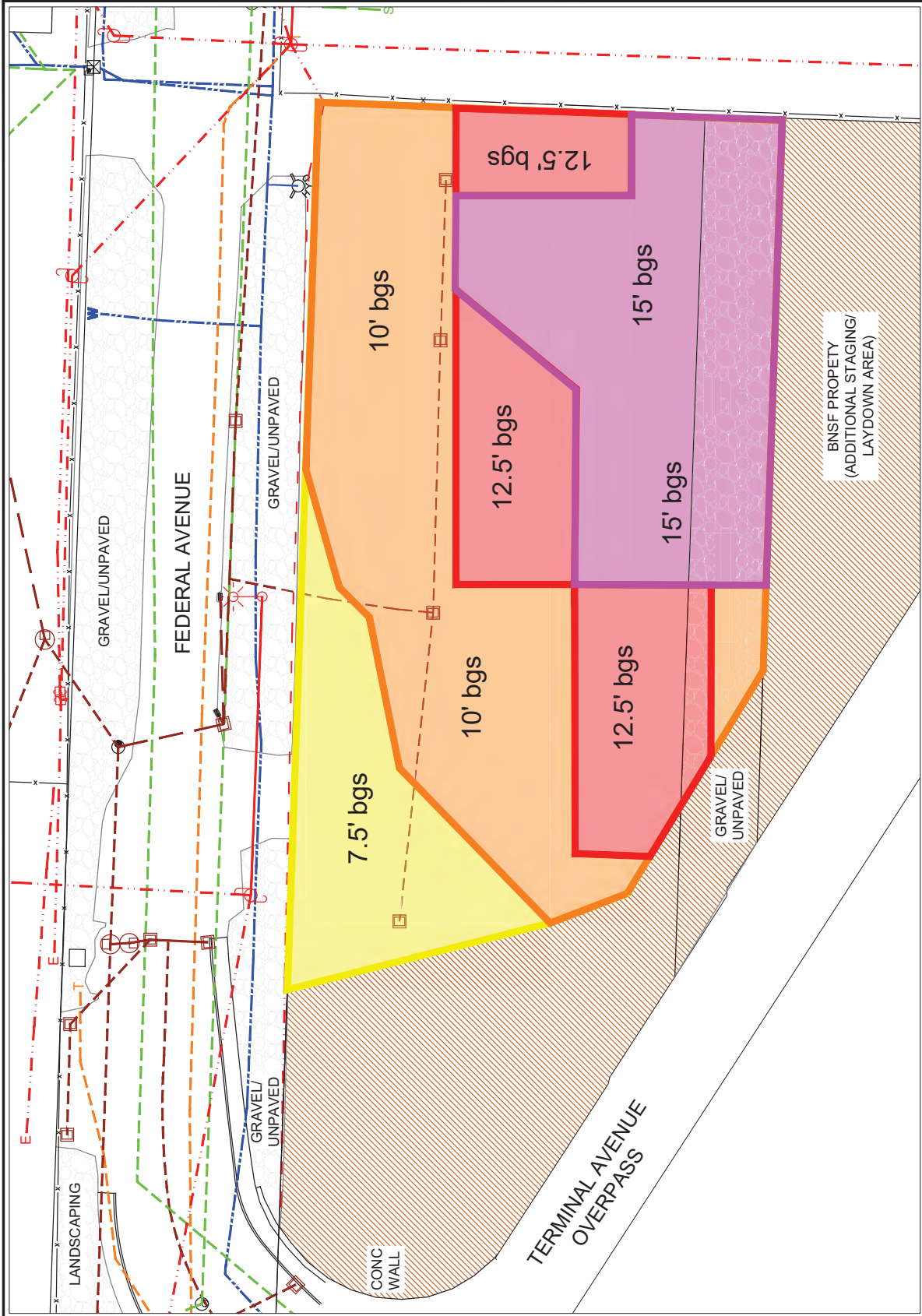
NOTES

- TBD.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941		DRAWING P-3		SHEET NO. Sheet 4	
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LAST REV. DATE:	05/22/23	DRAWN:	LANA COLE	SCALE: 1"= 40'	
DATE:	05/22/23	APPROVED:	BOBBY THOMPSON	PROJECT TITLE EXAMPLE STAGING PLAN	
				PROJECT ADDRESS EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington	
				LOGO Stantec	



EXPLANATION

- Excavation Extents
- Additional Staging/Laydown Area

UTILITIES LEGEND

- TELEPHONE
- ELECTRICAL
- WATER
- STORM DRAIN
- SEWER

NOTES

- TBD.

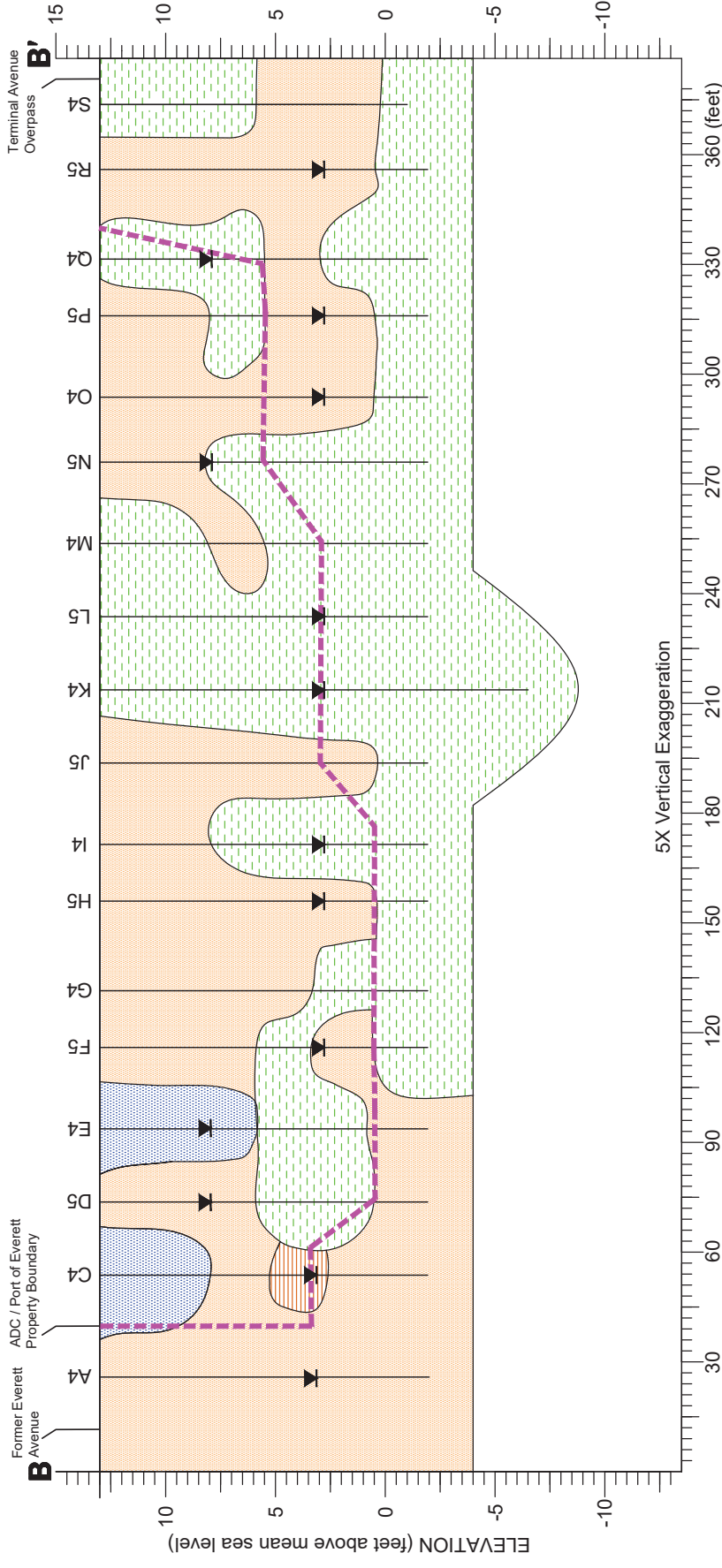
SOURCE: Modified by maps provided by ASP1, LLC

APPROXIMATE SCALE

PROJECT NO. 203722941		DRAWING C-1		SHEET NO. Sheet 5	
FN 203722941-RPP	DATE 05/22/23	NO.	REVISIONS	EXCAVATION PLAN	
LAST REV. DATE 05/22/23	DATE 05/22/23	DRAWN LANA COLE	APPROVED BOBBY THOMPSON	EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington	
SCALE: 1" = 40'			BNSF PROPERTY (ADDITIONAL STAGING/ LAYDOWN AREA)		

N

S



EXPLANATION

- ▲ Water Level Encountered During Drilling
- Excavation Limits

LITHOLOGY

- Coarse-grained Gravelly Sediments (GW, GP, GC)
- Coarse-grained Sandy Sediments (SW, SP, SM, SC)
- Fine-grained Sediments (CL, ML)
- Organic Sediments (Wood Debris)

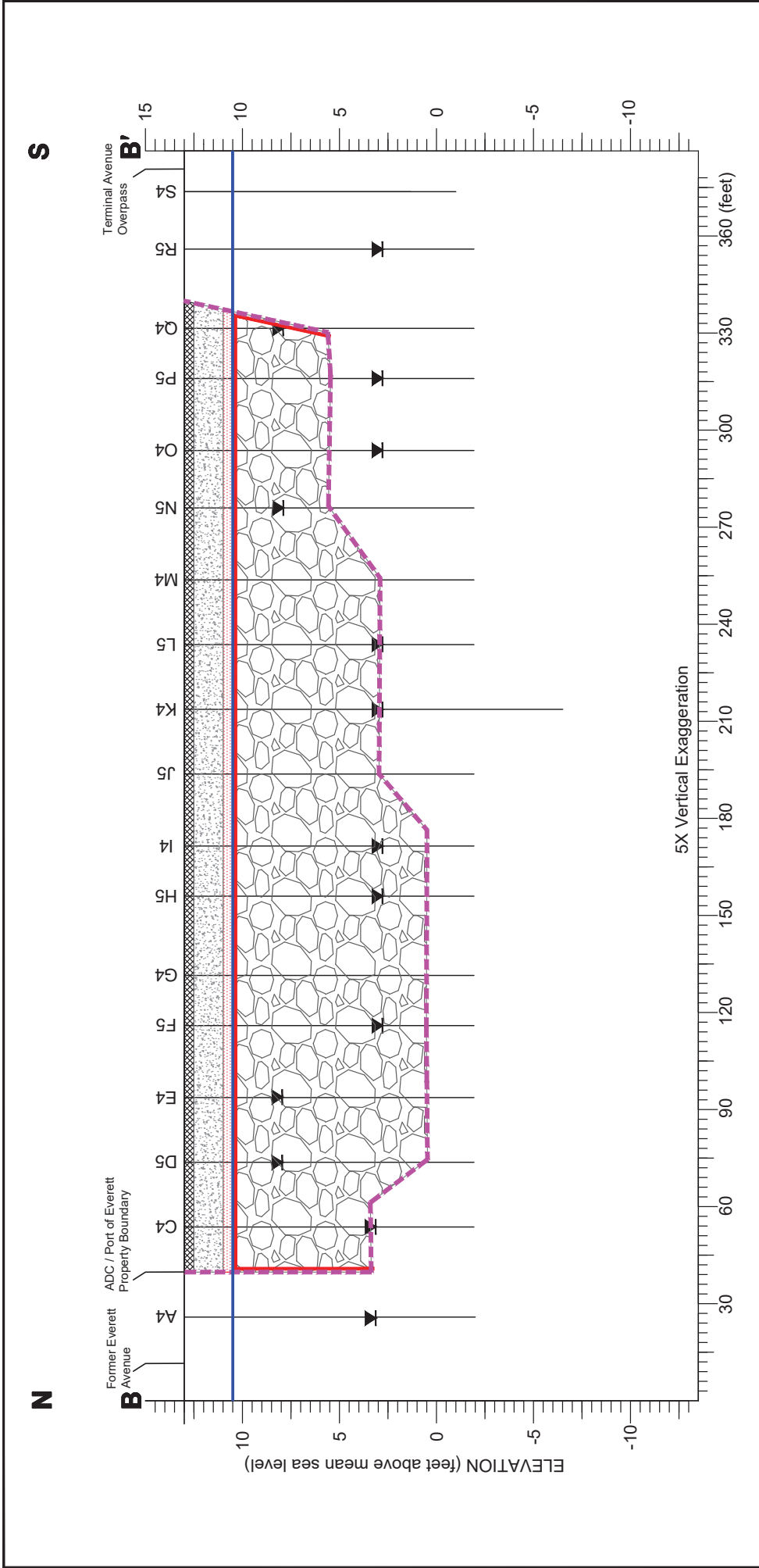
PROJECT NO.	203722941
FN	203722941-RPP
LAST REV. DATE:	05/22/23
DATE:	05/22/23
DRAWN:	LANA COLE
APPROVED:	BOBBY THOMPSON

REVISIONS	SCALE: 1" = 30'
3	
2	
1	
0	
DATE	

DRRAWING	C-2
----------	------------

EXCAVATION SECTION
 EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington





EXPLANATION

- Water Level Encountered During Drilling
- Excavation Limits
- Approximate Static Water Level
- Geotextile fabric to be placed along sides and top of backfill below water table

BACKFILL MATERIALS

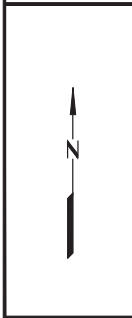
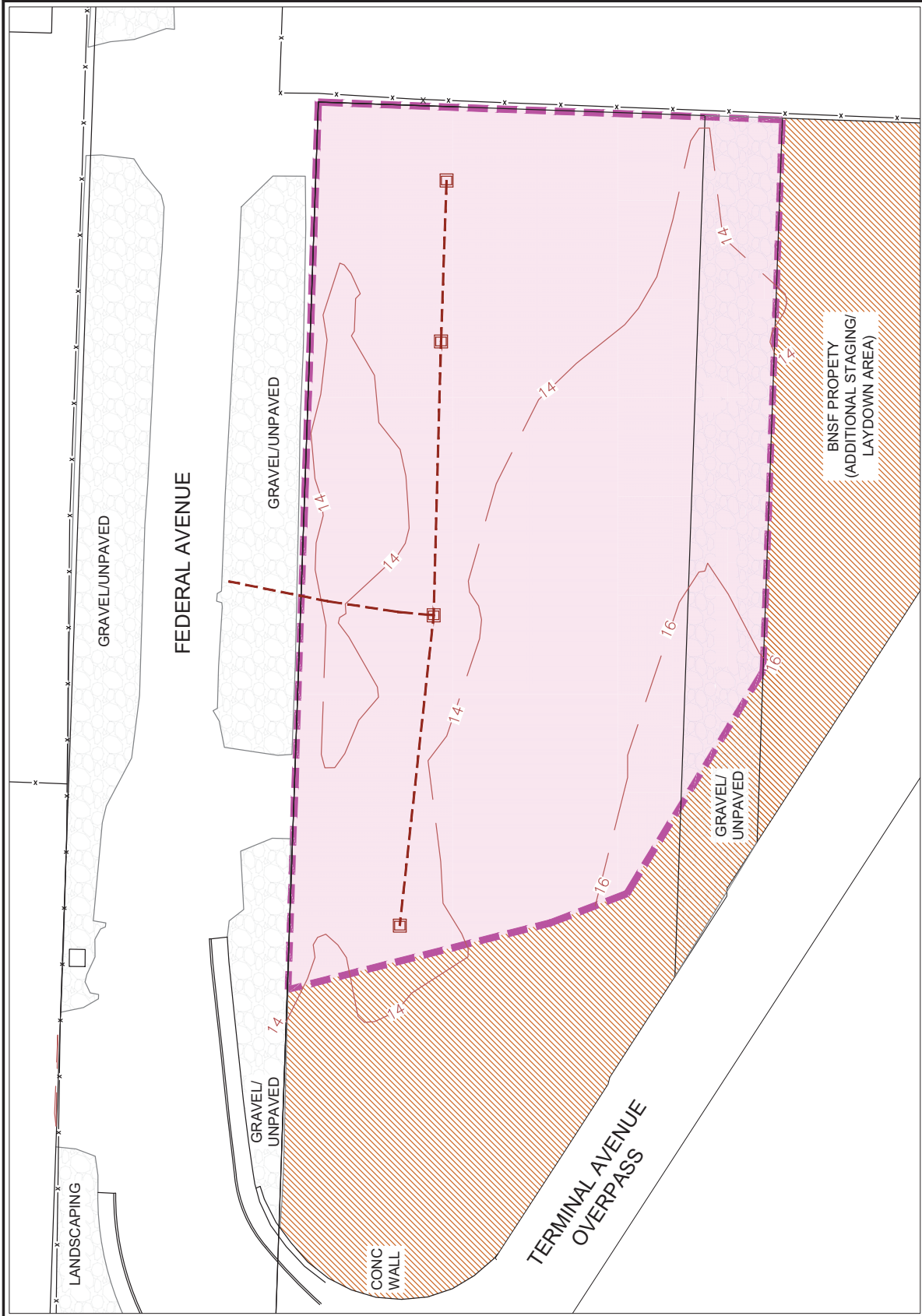
- 3/4-inch Class HMA
- Aggregate Base
- Subbase Above Water Table
- (AASHTO No. 57 or Equivalent) Below Water Table

NOTE: REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS ON BACKFILL MATERIALS AND PLACEMENT

APPROXIMATE SCALE

0 30 60 Feet

PROJECT NO.		203722941	
FN		203722941-RPP	
LAST REV. DATE:		05/22/23	
DATE:		05/22/23	
DRIVING DATE:		05/22/23	
DRIVER:		LANA COLE	
APPROVED:		BOBBY THOMPSON	
REVISIONS			
SCALE:		1" = 30'	
DRAWING		C-3	
BACKFILL SECTION		EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington	
Sheet 7			



EXPLANATION

- 14 Topographic Lines
- Excavation Extents
- Additional Staging/Laydown Area

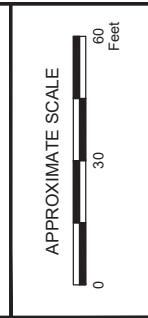
UTILITIES LEGEND

- STORM DRAIN

NOTES

- CONTRACTOR TO REPLACE FOUR (4) STORM DRAINS UPON COMPLETION OF PROJECT.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941	DRAWING C-4	SHEET 8	PAVING PLAN
FN: 203722941-RPP LAST REV. DATE: 05/22/23 DATE: 05/22/23	DRAWN: LAVIA COLE DATE: 05/22/23 APPROVED: BOBBY THOMPSON	SCALE: 1" = 40'	EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington

APPENDIX J

Stormwater Pollution Prevention Plan and Temporary Erosion and Sedimentation Control Plan



Construction Stormwater General Permit (CSWGP)

Stormwater Pollution Prevention Plan (SWPPP)

Project Name:
ExxonMobil ADC Remedial Excavation

Prepared for:
Department of Ecology
Northwest Region

Permittee / Owner	Developer	Operator / Contractor
ExxonMobil and American Distributing Company (ADC)		Innovative Construction Solutions (ICS)

Project Site: **2717 and 2731 Federal Avenue Everett, Washington**

Certified Erosion and Sediment Control Lead (CESCL)

Name	Organization	Contact Phone Number
TBD	TBD	TBD

SWPPP Prepared By

Name	Organization	Contact Phone Number
Leslie Hurley	Stantec Consulting Inc.	(425)-289-7306

SWPPP Preparation Date

01/30/2024

Project Construction Dates

Activity / Phase	Start Date	End Date
ExxonMobil ADC Remedial Excavation	April 2024	August 2025

Stormwater Pollution Prevention Plan
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List of Acronyms and Abbreviations

Acronym / Abbreviation	Explanation
303(d)	Section of the Clean Water Act pertaining to Impaired Waterbodies
BFO	Bellingham Field Office of the Department of Ecology
BMP(s)	Best Management Practice(s)
CESCL	Certified Erosion and Sediment Control Lead
CO₂	Carbon Dioxide
CRO	Central Regional Office of the Department of Ecology
CSWGP	Construction Stormwater General Permit
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
ERO	Eastern Regional Office of the Department of Ecology
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
GULD	General Use Level Designation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
NWRO	Northwest Regional Office of the Department of Ecology
pH	Power of Hydrogen
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasure
su	Standard Units
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
SWRO	Southwest Regional Office of the Department of Ecology
TMDL	Total Maximum Daily Load
VFO	Vancouver Field Office of the Department of Ecology
WAC	Washington Administrative Code
WSDOT	Washington Department of Transportation
WWHM	Western Washington Hydrology Model

Project Information (1.0)

Project/Site Name: Exxon Mobil ADC Remedial Excavation

Street/Location: 2717 and 2731 Federal Avenue

City: Everett State: WA Zip code: 98201

Subdivision: Not Applicable

Receiving waterbody: Port Gardner Bay / Possession Sound

Existing Conditions (1.1)

Total acreage (including support activities such as off-site equipment staging yards, material storage areas, borrow areas).

Total acreage: 0.86 acres (All of Clean Up Site property including staging areas)

Disturbed acreage: 0.12 acres (estimated extent of excavation)

Existing structures: No existing structures on the property.

Landscape topography: The project site slightly slopes from east to west.

Drainage patterns: Overland flows cross existing asphalt-paved site generally from east to west towards a catch basin near the western third of the properties, near the center. The drainage pipe system (storm system shown in Appendix A plans) drains to the right of way in Federal Avenue to the west then, north and outfalls to Port Gardner Bay. There are multiple nearby storm system catch basins that require protection throughout construction

Existing Vegetation: The site is nearly completely impervious with the exception of some shrubs and grasses, including Himalayan blackberry and butterfly bush on edge of site.

Critical Areas (wetlands, streams, high erosion risk, steep or difficult to stabilize slopes): None

List of known impairments for 303(d) listed or Total Maximum Daily Load (TMDL) for the receiving waterbody:

Port Gardner Bay

Table 1 includes a list of suspected and/or known contaminants associated with the construction activity.

Table 1: Summary of Site Pollutant Constituents

Constituent (Pollutant)	Location	Depth	Concentration (mg/kg)
TPHg	Soil	2.5 to 20 feet	<10 to <100
TPHd	Soil	2.5 to 20 feet	<50 to 43,000
TPHmo	Soil	2.5 to 20 feet	<250 to 13,000
Benzene	Groundwater	2.5 to 20 feet	<1.0 to 2.6 mg/L
Ethylbenzene	Soil	2.5 to 20 feet	<1.0 to <4.0 mg/L
Total Xylenes	Soil	2.5 to 20 feet	<1.0 to <40 mg/L
Total cPAHs	Soil	2.5 to 20 feet	Not known
1-Methylnaphthalene	Soil	2.5 to 20 feet	Not known

Proposed Construction Activities (1.2)

Description of site development:

The Exxon Mobil ADC Remedial Excavation project is located within a Department of Ecology Clean Up Site (Ecology Site). The Ecology Site boundary is 3.37 acres, encompassing private property to the east of Federal Avenue, and Port of Everett (Port Property) to the west of Federal Avenue. The entire Ecology Site consists of a paved parking lot; portions of Federal Avenue, the Terminal Avenue Overpass, and the former Everett Avenue; and portions of Everett Ship Repair and Dunlap Towing. Historical releases of petroleum products have been documented at the Ecology Site due to former operation of bulk petroleum storage, transfer, and distribution facilities on the Ecology Site and operations of other companies on nearby parcels.

This project, the Exxon Mobil ADC Remedial Excavation, is to cleanup soil and groundwater impacted by light non-aqueous phase liquid (LNAPL) and/or residual LNAPL saturation on the Exxon Mobil ADC Property on the east side of Federal Avenue. Approximately 17,500 cubic yards of material will be excavated and removed to a depth of 20 feet below ground surface. After construction activities, the project area will be backfilled, re-graded to preexisting contours, repaved, and restored to existing uses. As the part of first round of remediation, a permanent barrier has been installed along Federal Avenue to limit the LNAPL migration.

Description of construction activities (example: site preparation, demolition, excavation):

Proposed cleanup activities include excavation of impacted soils on the east side of Federal Avenue on ExxonMobil ADC Property, and groundwater monitoring of the Ecology Site. The scope of construction activities in order of sequence includes:

- Fencing removal and temporary fencing installation
- Utility services disconnection, rerouting and protection
- Sawcutting, breakout and removal of asphalt
- Sheet pile shoring
- Remedial excavation
- Surface restoration
- Site restoration

Due to the shallow water table in the project area, water management during the excavation, including limited dewatering, may be necessary. Any wastewater generated during dewatering will be discharged to a City of Everett-approved discharge point. Impacted soil will be transported offsite by truck to a temporary staging area, then loaded onto trucks for transport to its final disposal location at a permitted landfill facility.

The soils beneath Federal Avenue will not be excavated, and the street will remain open during cleanup activities. A permanent barrier wall has already been installed on western side of Federal Avenue to limit LNAPL migration following the remedial excavation on the Port Property. Post excavation, the shoring walls will be removed and area will be backfilled, regraded to preexisting contours, repaved and restored to existing uses.

Groundwater sampling occurs semiannually at the site to monitor natural degradation of groundwater contaminants of concern (COCs) by natural processes in the areas below Federal Avenue, and otherwise inaccessible to excavation.

Description of site drainage including flow from and onto adjacent properties. Must be consistent with Site Map in Appendix A:

Surface water drainage in the project area generally flows from northeast to west in the area of land disturbing activities. Flows reach catch basins in the work area and the right-of-way of Federal Avenue.

Description of final stabilization (example: extent of revegetation, paving, landscaping):
All disturbed areas will be paved to pre-existing surface conditions.

Contaminated Site Information:

Proposed activities regarding contaminated soils or groundwater (example: on-site treatment system, authorized sanitary sewer discharge):

On-site pretreatment of contaminated groundwater will be provided by Contractor. Contractor should anticipate encountering groundwater contaminated within the COPCs including but not limited to motor oil, diesel, gasoline, benzene, toluene, ethylbenzene, xylenes, polynuclear aromatic hydrocarbons, 1-methylnaphthalene and LNAPL.

The groundwater collection and treatment system is designed to extract and treat up 150 gallons per minute (GPM) from the excavation pits. The water extraction and treatment system will include the following components:

- One 18,000-gallon capacity weir tank. The tank will act as a settling tank and capture any liquid phase hydrocarbons (LPH).
- Two 21,000-gallon capacity frac tanks. One of the tanks will be installed prior to the treatment and the second tank will be installed post treatment to allow batching of the discharge.
- One bag filter skid capable of treating over 150 gallons per minute (GPM).
- Four 2,000-pound capacity granular activated carbon (GAC) vessels to treat water prior to discharge.
- Miscellaneous pumps, hoses, fittings, flow meter, sample port, etc. to pump and treat water from the pit at a rate of 150 GPM.
- diesel generator to power the pumps.
- Discharge line from the treatment system to the sanitary sewer discharge point.
- Containment berms for the three tanks and filtration equipment.

An initial batch of groundwater must be stored and sampled to produce analytical results showing the treated groundwater meets the City of Everett permissible limits in the following table.

Table 2: Permissible Pretreatment Limits for City of Everett Sanitary Sewer

Analyte	Limit (mg/L)
Arsenic	0.5
Cadmium	0.24
Chromium	5.0
Copper	3.0
Lead	1.9
Mercury	0.1
Nickel	2.83
Silver	0.49
Zinc	4.0
Copernicium	0.65
Nonpolar FOG	200
Hydrocarbons	200

In addition to the analyte limits above, the treated groundwater should have closed cup flashpoint of greater than 140 degrees Fahrenheit, no visible floating product, and nothing that creates fire or explosion hazards in the downstream sewer. The sampling of the groundwater and payment of laboratory charges shall be the responsibility of Cardno. Contractor shall assume a minimum 72 hours from time of sampling to receipt of laboratory results. The water generated during this decontamination shall also be stored, treated and discharged to the City of Everett sewer system in compliance with Discharge Permit that can be found in Appendix C

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In addition to dewatering of removed material, the contractor will be required to decontaminate removed steel from the temporary shoring wall, prior to loading offsite.

Construction Stormwater Best Management Practices (BMPs) (2.0)

BMPs identified to control pollutants in stormwater discharges. Depending on the site, multiple BMPs for each element may be necessary. For each element identified:

- Clearly describe the control measure(s).
- Describe the implementation sequence.
- Describe the inspection and maintenance procedures for that specific BMP.
- Identify the responsible party for maintaining BMPs (if your SWPPP is shared by multiple operators, indicate the operator responsible for each BMP).

Categorize each BMP under one of the following elements as listed below:

SUMMARY OF CONSTRUCTION STORMWATER BMPS BY SWPPP ELEMENT

1. Preserve Vegetation / Mark Clearing Limits
 - a. Vegetation along the perimeter of the site to be preserved and three island of vegetation between Federal Avenue and 2717 Federal Avenue.
 - b. Limits of construction activity must be delineated with fencing
2. Establish Construction Access
 - a. C105 Stabilized Construction Access
3. Control Flow Rates
 - a. Not applicable
4. Install Sediment Controls
 - a. Not applicable, no sediment sources flowing into site
5. Stabilize Soils
 - a. C123 Plastic Covering
6. Protect Slopes
 - a. Not applicable, no slopes on site
7. Protect Drain Inlets
 - a. C220: Inlet Protection
8. Stabilize Channels and Outfalls
 - a. Not applicable, no outfalls at site and all discharge routed to sanitary system
9. Control Pollutants
 - a. C153: Material Delivery, Storage and Containment
 - b. S426 BMPs for Spills of Oil and Hazardous Substances
10. Control Dewatering
 - a. BMP C251: Construction Stormwater Filtration (Granular Activated Carbon Treatment) – Note that this BMP is being used only for groundwater sources, not overland flow at project.
11. Maintain BMPs
12. Manage the Project
13. Protect Low Impact Development
 - a. No existing low impact development on site, nearby proposed facilities possible

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The 12 Elements (2.1)

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.

Element 1: Preserve Vegetation / Mark Clearing Limits (2.1.1)

List and describe BMPs:

C101: Limited-site vegetation for shrubs and grasses along perimeter of site to be preserved.

Site fencing:

Metal fences shall be designed and installed according to the manufacturer's specifications.

Metal fences shall be at least 3 feet high and must be highly visible.

Maritime Security (**MARSEC**) Fencing: MARSEC-rated fencing used on site shown in Appendix A and must be a minimum of 8 feet high with an additional 1-foot top guard (ex: razor or barbed wire).

Other site fencing shown Appendix A drawings included 6-foot tall security fencing

Fences shall not be wired or stapled to trees.

Installation Schedules: Before other construction activities begin

Inspection and Maintenance plan:

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

Responsible Staff: CESCL

Element 2: Establish Construction Access (2.1.2)

*List and describe BMPs:*C105 Stabilized Construction Access

If the site existing impervious cover is removed at any point where construction vehicles and trucks are accessing site, quarry spalls shall be placed to a thickness of 12" to stabilize equipment access.

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 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.

Installation Schedules: April 2024

Inspection and Maintenance plan: Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.

Street sweeping shall be performed after daily construction activities are completed at a minimum.

Responsible Staff: CESCL

Element 3: Control Flow Rates (2.1.3)

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**

List and describe BMPs: Not applicable

Installation Schedules: Not applicable

Inspection and Maintenance plan: Not applicable

Responsible Staff: Not applicable

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Element 4: Install Sediment Controls (2.1.4)

List and describe BMPs: Not applicable, no sediment sources flowing into site

Installation Schedules: Not applicable

Inspection and Maintenance plan: Not applicable

Responsible Staff: Not applicable

Element 5: Stabilize Soils (2.1.5)

Table 3: West of the Cascade Mountains Crest Soil Exposure Duration Limits

Season	Dates	Number of Days Soils Can be Left Exposed
During the Dry Season	May 1 – September 30	7 days
During the Wet Season	October 1 – April 30	2 days

Soils must be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

Anticipated project dates: Start date: April , 2024

End date: August 2025

Will you construct during the wet season?

Yes **No**

List and describe BMPs:

C123 Plastic Covering

Plastic covering may be installed over stockpiles. Excavation of contaminated soil may only be stockpiled on site for drying and must be placed in trucks for haul off as soon as feasible.

S429 BMPs for Storage or Transfer (Outside) of Solid Raw Materials, Byproducts, or Finished Products

Contact between outside bulk materials and stormwater can cause leachate, and erosion of the stored materials. Contaminants may include TSS, BOD, organics, and dissolved salts (sodium, calcium, and magnesium chloride, etc.).

Pollutant Control Approach: Provide impervious containment with berms, dikes, etc. and/or cover to prevent run-on and discharge of leachate pollutant(s) and TSS. Applicable Operational BMPs:

- Do not hose down the contained stockpile area to a storm drain or a conveyance to a storm drain, or to a receiving water.
- Maintain drainage areas in and around storage of solid materials with a minimum slope of 1.5 percent to prevent pooling and minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter for collection or to internal drainage “alleyways” where no stock-piled material exists.
- Sweep paved storage areas regularly for collection and disposal of loose solid materials.
- If and when feasible, collect and recycle water-soluble materials (leachates).
- Stock cleanup materials, such as brooms, dustpans, and vacuum sweepers near the storage area

For stockpiles less than 5 cubic yards, place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent) over the material as shown in Figure IV5.7: Material Covered with Plastic Sheeting.

The source control BMP options listed below are applicable to:

Stockpiles greater than 5 cubic yards of erodible or water soluble materials such as:

- Soil
- Road deicing salts
- Compost
- Unwashed sand and gravel
- Sawdust

Outside storage areas for solid materials such as:

- Logs
- Bark
- Lumber
- Metal products

Choose one or more of the following Source Control BMPs: Store in a building or paved and bermed covered area as shown in Figure IV-5.6: Covered Storage Area for Bulk Solids.

- Place temporary plastic sheeting (polyethylene, polypropylene, hypalon, or equivalent). Cover the material as shown in Figure IV-5.7: Material Covered with Plastic Sheeting. Pave the area and install a drainage system.
- Place curbs or berms along the perimeter of the area to prevent the run-on of uncontaminated stormwater and to collect and convey runoff to treatment. Slope the paved area in a manner that minimizes the contact between stormwater (e.g., pooling) and leachable materials in compost, logs, bark, wood chips, etc.

For large uncovered stockpiles, implement containment practices at the perimeter of the site and at any catch basins as needed to prevent erosion and discharge of the stockpiled material offsite or to a storm drain. Ensure that no direct discharge of contaminated stormwater to catch basins exists without conveying runoff through an appropriate treatment BMP.

- 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 (12inch wide by 6inch deep) slot trench at the top of the slope and backfill with soil to keep water from flowing underneath.

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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.

Installation Schedules: As needed throughout construction

Inspection and Maintenance plan:

Responsible Staff: CESCL

Stormwater Pollution Prevention Plan
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Element 6: Protect Slopes (2.1.6)

Will steep slopes be present at the site during construction?

Yes **No**

List and describe BMPs: Not applicable

Installation Schedules: Not applicable

Inspection and Maintenance plan: Not applicable

Responsible Staff: Not applicable

Element 7: Protect Drain Inlets (2.1.7)

List and describe BMPs:

C220: Inlet Protection

Insert catch basin filters just below the grating of all catch basins within 500 feet of the site. This includes any catch basin south of the site on Federal Avenue.

Installation Schedules: Install inlet protection prior to any disturbance activities. April 2024.

Inspection and Maintenance plan: Inlets will be inspected weekly at a minimum and daily during storm events.

Responsible Staff: CESCL

Element 8: Stabilize Channels and Outlets (2.1.8)

Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches, will be installed at the outlets of all conveyance systems.

List and describe BMPs: Not applicable.

Installation Schedules: Not applicable.

Inspection and Maintenance plan: Not applicable.

Responsible Staff: Not applicable.

Element 9: Control Pollutants (2.1.9)

The following pollutants are anticipated to be present on-site:

Table 4: Anticipated On-site Pollutants

Pollutant (and source, if applicable)
Fuel (construction equipment)
Petroleum (soil and groundwater being remediated)

List and describe BMPs: C153: Material Delivery, Storage and Containment

Fuel used on site for construction equipment must be stored with secondary containment. A fuel spill clean-up kit must be on site at all times

The on-site soil contaminants will be hauled offsite for permanent disposal.

Installation Schedules: Begins when equipment is mobilized, April 2024.

Inspection and Maintenance plan: Secondary containment for fueling activities must be monitored at all times.

Responsible Staff: CESCL

Will maintenance, fueling, and/or repair of heavy equipment and vehicles occur on-site?

Yes **No**

List and describe BMPs: S426 BMPs for Spills of Oil and Hazardous Substances

Installation Schedules: Begins when equipment is mobilized, April 2024.

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

Will wheel wash or tire bath system BMPs be used during construction?

Yes **No**

List and describe BMPs: Not applicable

Installation Schedules: Not applicable

Inspection and Maintenance plan: Not applicable

Responsible Staff: Not applicable

Will pH-modifying sources be present on-site?

Yes **No** If yes, check the source(s).

Table 5: pH-Modifying Sources

<input checked="" type="checkbox"/>	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
	Other (i.e. calcium lignosulfate) [please describe]

Describe BMPs you will use to prevent pH-modifying sources from contaminating stormwater.

List and describe BMPs: Not applicable, only asphalt on site, no concrete

Installation Schedules: Not applicable

Inspection and Maintenance plan: Not applicable

Responsible Staff: Not applicable

Concrete trucks must not be washed out onto the ground, or into storm drains, open ditches, streets, or streams. Excess concrete must not be dumped on-site, except in designated concrete washout areas with appropriate BMPs installed.

Element 10: Control Dewatering (2.1.10)

List and describe BMPs:

The site has shallow groundwater that is known to be contaminated. Dewatering will be minimized as feasible on site within the excavation area. On site treatment technology to meet requirements for discharge to City of Everett's sanitary system will be provided, otherwise materials will be hauled off-site by trucks for permitted disposal.

See Contaminated Site Information for description of groundwater and contaminated stormwater treatment system.

Table 6: Dewatering BMPs

	Infiltration
<input checked="" type="checkbox"/>	Transport off-site in a vehicle (vacuum truck for legal disposal)
	Ecology-approved on-site chemical treatment or other suitable treatment technologies
<input checked="" type="checkbox"/>	Sanitary or combined sewer discharge with local sewer district approval (last resort)
	Use of sedimentation bag with discharge to ditch or swale (small volumes of localized dewatering)

Installation Schedules: TBD / See Appendix A, ICS Site Layout with Dewatering

Inspection and Maintenance plan: TBD

Responsible Staff: TBD

Element 11: Maintain BMPs (2.1.11)

This section is a list of permit requirements and does not have to be filled out.

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 SWMMWW* or *Chapter 7 of the SWMMEW*).

Visual monitoring of all BMPs installed at the site will be conducted 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 shall 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.

Additionally, protection must be provided for all BMPs installed for the permanent control of stormwater from sediment and compaction. BMPs that are to remain in place following completion of construction shall be examined and restored to full operating condition. If sediment enters these BMPs during construction, the sediment shall be removed and the facility shall be returned to conditions specified in the construction documents.

Element 12: Manage the Project (2.1.12)

The project will be managed based on the following principles:

- Projects will be phased to the maximum extent practicable and seasonal work limitations will be taken into account.
- 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 will be conducted in accordance with Special Condition S4 of the CSWGP. Sampling locations are indicated on the [Site Map](#). Sampling station(s) are located in accordance with applicable requirements of the CSWGP. The site has no stormwater discharge points or sampling locations and none are shown in Appendix A.
- 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 routinely to reflect changing site conditions. The SWPPP will be reviewed monthly to ensure the content is current.

Check all the management BMPs that apply at your site:

Table 7: Management

	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
<input checked="" type="checkbox"/>	Thoroughly monitor site and maintain all ESC measures
<input checked="" type="checkbox"/>	Schedule major earthwork during the dry season
	Other (please describe)

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
ExxonMobil ADC Remedial Excavation, Clean Up Site No. 5182

Element 13: Protect Low Impact Development (LID) BMPs (2.1.13)

No existing low impact development on project site, coordination with City of Everett on-going for future construction of nearby low impact development best management practices.

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
ExxonMobil ADC Remedial Excavation, Clean Up Site No. 5182

Pollution Prevention Team (3.0)

Table 9: Team Information

Title	Name(s)	Phone Number
Certified Erosion and Sediment Control Lead (CESCL)	TBD	TBD
Resident Engineer	Jim Twiford	916-799-4839
Emergency Ecology Contact	Jason Cook	360-407-7170
Emergency Permittee/ Owner Contact	Bobby Thompson	206-510-5855
Non-Emergency Owner Contact	Cameron Penner-Ash	503 869 1196
Monitoring Personnel	TBD	TBD
Ecology Regional Office	Shoreline Receptionist	206-594-0000

Monitoring and Sampling Requirements (4.0)

Monitoring includes visual inspection, sampling for water quality parameters of concern, and documentation of the inspection and sampling findings in a site log book.

Throughout construction of this project stormwater flows that would normally pass through the site in a 15-inch diameter storm pipe will be conveyed through a series of pumps and pipes to bypass the construction site and will be discharged into an existing stormwater vault in the northern region of the site.

As described in Contaminated Site Information section, any ground-water or rainwater that comes into contact with open excavation will be directed to treatment process including granular activated carbon and discharged to the sanitary sewer system as authorized by the City of Everett. Due to the lack of sheet flow on the site and sediments entering site, stormwater sampling for turbidity and pH will not be required and these sections have been omitted.

A site log book 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

A blank site inspection form is filed under Appendix D.

The site log book must be maintained on-site within reasonable access to the site and be made available upon request to Ecology or the local jurisdiction.

Numeric effluent limits may be required for certain discharges to 303(d) listed waterbodies. See CSWGP Special Condition S8 and Section 5 of this template.

Complete the following paragraph for sites that discharge to impaired waterbodies for fine sediment, turbidity, phosphorus, or pH:

The receiving waterbody, Port Gardner Bay, is impaired for: sediment contamination. However, as stated above all dewatering discharges from the site will be discharged to sanitary sewer. The effluent limit of 8.5 su for pH and/or 25 NTU for turbidity is not applicable. Discharges to sanitary sewer are subject to limits shown in Table 2: Permissible Pretreatment Limits for City of Everett Sanitary Sewer.

Site Inspection (4.1)

Site inspections will be conducted at least once every calendar week and within 24 hours following any discharge from the site. For sites that are temporarily stabilized and inactive, the required frequency is reduced to once per calendar month.

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
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The discharge point(s) are indicated on the Site Map (see Appendix A) and in accordance with the applicable requirements of the CSWGP. The site has no stormwater discharge points so none are shown in Appendix A.

Discharges to 303(d) or Total Maximum Daily Load (TMDL) Waterbodies (5.0)

The ExxonMobil ADC Remedial Excavation project lies within the drainage basin of Port Gardner / Possession Sound. This receiving waterbody is a 303(d) listed waterbody. Port Gardner / Possession Sound do not have a total maximum daily load (TMDL) plan established between the City of Everett and Ecology. This project will not discharge project site stormwater into Port Gardner Bay.

303(d) Listed Waterbodies (5.1)

The 303(d) status is listed on the Water Quality Atlas: <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d>

Circle the applicable answer, if necessary:

Is the receiving water 303(d) (Category 5) listed for turbidity, fine sediment, phosphorus, or pH?

Yes **No**

List the impairment(s):

The receiving waterbody, Port Gardner Bay, is impaired for: sediment contamination.

If yes, discharges must comply with applicable effluent limitations in S8.C and S8.D of the CSWGP.

Describe the method(s) for 303(d) compliance:

As stated above, all dewatering discharges from the site will be discharged to sanitary sewer. The effluent limit of 8.5 su for pH and/or 25 NTU for turbidity is not applicable because no discharges to Port Gardner Bay will occur. Site groundwater and rainfall in excavation will be discharged to sanitary sewer and are subject to limits shown in Table 2: Permissible Pretreatment Limits for City of Everett Sanitary Sewer.

List and describe BMPs:

The contaminated groundwater and stormwater will be treated with a granular activated carbon system described in the Contaminated Site Information section that will be discharged to the sanitary sewer system. No construction stormwater will discharge to Port Gardner Bay.

TMDL Waterbodies (5.2)

Waste Load Allocation for CWSGP discharges:

No waste load allocations determined for Port Gardner Bay, and water coming from project site will be pretreating discharged to sanitary sewer.

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
ExxonMobil ADC Remedial Excavation, Clean Up Site No. 5182

List and describe BMPs:

The contaminated groundwater and stormwater will be treated with a granular activated carbon system described in the Contaminated Site Information section that will be discharged to the sanitary sewer system. No construction stormwater will discharge to Port Gardner Bay.

Reporting and Record Keeping (6.0)

Record Keeping (6.1)

Site Log Book (6.1.1)

A site log book 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
- Sample logs

Records Retention (6.1.2)

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:

- CSWGP
- Permit Coverage Letter
- SWPPP
- Site Log Book

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 (6.1.3)

The 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 (6.2)

Discharge Monitoring Reports (6.2.1)

Due to contaminated site, the stormwater system and outfall will not receive discharges from this project site. Discharges from the project site will be limited to dewatering activities that include pretreatment using granular activated carbon and discharge to sanitary sewer. See section on Contaminated Site Information.

Groundwater sampling will occur biannually. No Discharge Monitoring Reports (DMRs) are not necessary because site stormwater will not be discharged to a receiving waterbody at any time and land disturbance (excavation) totals less than 1 acre according to staging plans in Appendix A.

If it determined DMRs are still a requirement, DMRs will be reported online through Ecology's WQWebDMR System.

To sign up for WQWebDMR go to:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

Notification of Noncompliance (6.2.2)

If any of the terms and conditions of the permit is not met, and the resulting noncompliance may cause a threat to human health or the environment, the following actions will be taken:

1. Ecology will be notified within 24-hours of the failure to comply by calling the applicable Regional office ERTS phone number (Regional office numbers listed below).
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 within five (5) days, unless requested earlier by Ecology.

Specific information to be included in the noncompliance report is found in Special Condition S5.F.3 of the CSWGP.

Anytime turbidity sampling indicates turbidity is 250 NTUs or greater, or water transparency is 6 cm or less, the Ecology Regional office will be notified by phone within 24 hours of analysis as required by Special Condition S5.A of the CSWGP.

- Northwest Region at (425) 649-7000 for Island, King, Kitsap, San Juan, Skagit, Snohomish, or Whatcom County

Include the following information:

1. Your name and / Phone number

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
ExxonMobil ADC Remedial Excavation, Clean Up Site No. 5182

2. Permit number
3. City / County of project
4. Sample results
5. Date / Time of call
6. Date / Time of sample
7. Project name

In accordance with Special Condition S4.D.5.b of the CSWGP, the Ecology Regional office will be notified if chemical treatment other than CO₂ sparging is planned for adjustment of high pH water.

Stormwater Pollution Prevention Plan
Washington State Department of Ecology, Construction Stormwater General Permit
ExxonMobil ADC Remedial Excavation, Clean Up Site No. 5182

Appendices

Appendix A: Site Map and Drawings/Plans

ExxonMobil ADC Remedial Exvcavation Site Plan

ExxonMobil ADC Remedial Excavation Temporary Erosion and Sedimentation Control Plan

Draft Excavation Plans

LEGEND:

- - - - - LIMIT OF EXCAVATION
- TEMPORARY CONSTRUCTION FENCE
- EXISTING STORMWATER SEWER
- EXISTING SANITARY SEWER
- EXISTING WATER

TOTAL SITE AREA (INCLUDING STAGING): 0.85 ACRES
 AREA OF DISTURBANCE: 0.12 ACRES
 ELEMENT #1: PRESERVE VEGETATION/MARKING CLEARING LIMITS
 NO VEGETATION TO PROTECT. SEE STAGING PLANS
 1 THROUGH 4 FOR CONSTRUCTION FENCING

ELEMENT #2: ESTABLISH CONSTRUCTION ACCESS:
 BMP C'105: STABILIZED CONSTRUCTION ENTRANCE/EXIT
 NOT APPLICABLE TO PROJECT

ELEMENT #3: CONTROL FLOW RATES:
 NOT APPLICABLE TO PROJECT

ELEMENT #4: INSTALL SEDIMENT CONTROLS:
 NOT APPLICABLE TO PROJECT

ELEMENT #5: STABILIZE SOILS:
 BMP C'123: PLASTIC COVERING

ELEMENT #6: PROTECT SOILS:
 NOT APPLICABLE TO PROJECT

ELEMENT #7: PROTECT DRAIN INLETS
 BMP C'220: STORM DRAIN INLET PROTECTION

ELEMENT #8: STABILIZE CHANNELS AND OUTLETS
 NOT APPLICABLE TO PROJECT

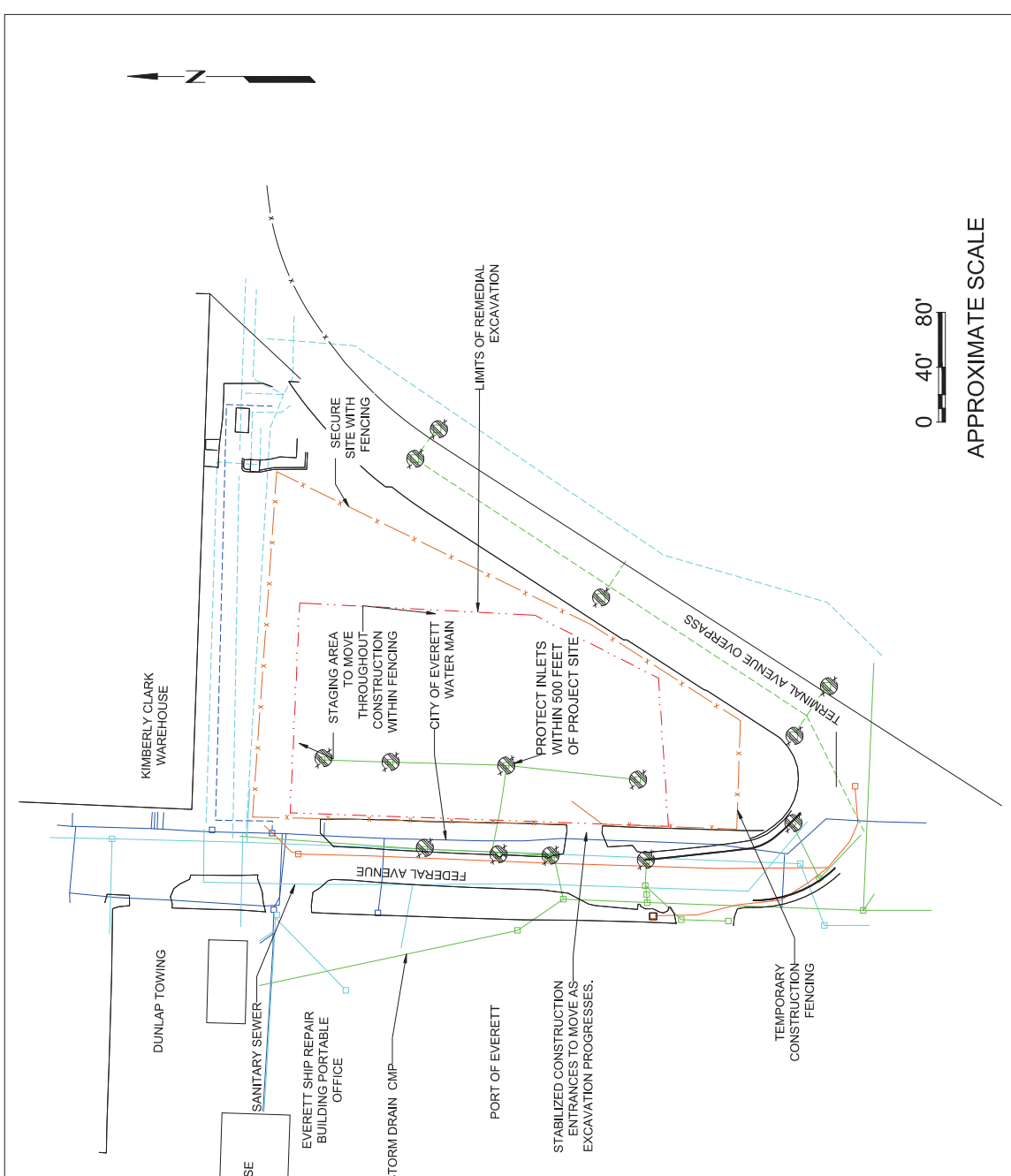
ELEMENT #9: CONTROL POLLUTANTS
 BMP C'152: SAWCUTTING AND SURFACING POLLUTION PREVENTION
 BMP C'153: MATERIAL DELIVERY STORAGE AND CONTAINMENT

ELEMENT #10: CONTROL DEWATERING
 GROUNDWATER AND RAINFALL IN EXCAVATION GENERATED WILL BE TREATED ON SITE
 WITH TREATMENT TECHNOLOGY PROPOSED BY CONTRACTOR, APPROVED BY CARDONO

ELEMENT #11: MAINTAIN BMP'S:
 BMP C'150: MATERIALS ON HAND
 BMP C'160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD

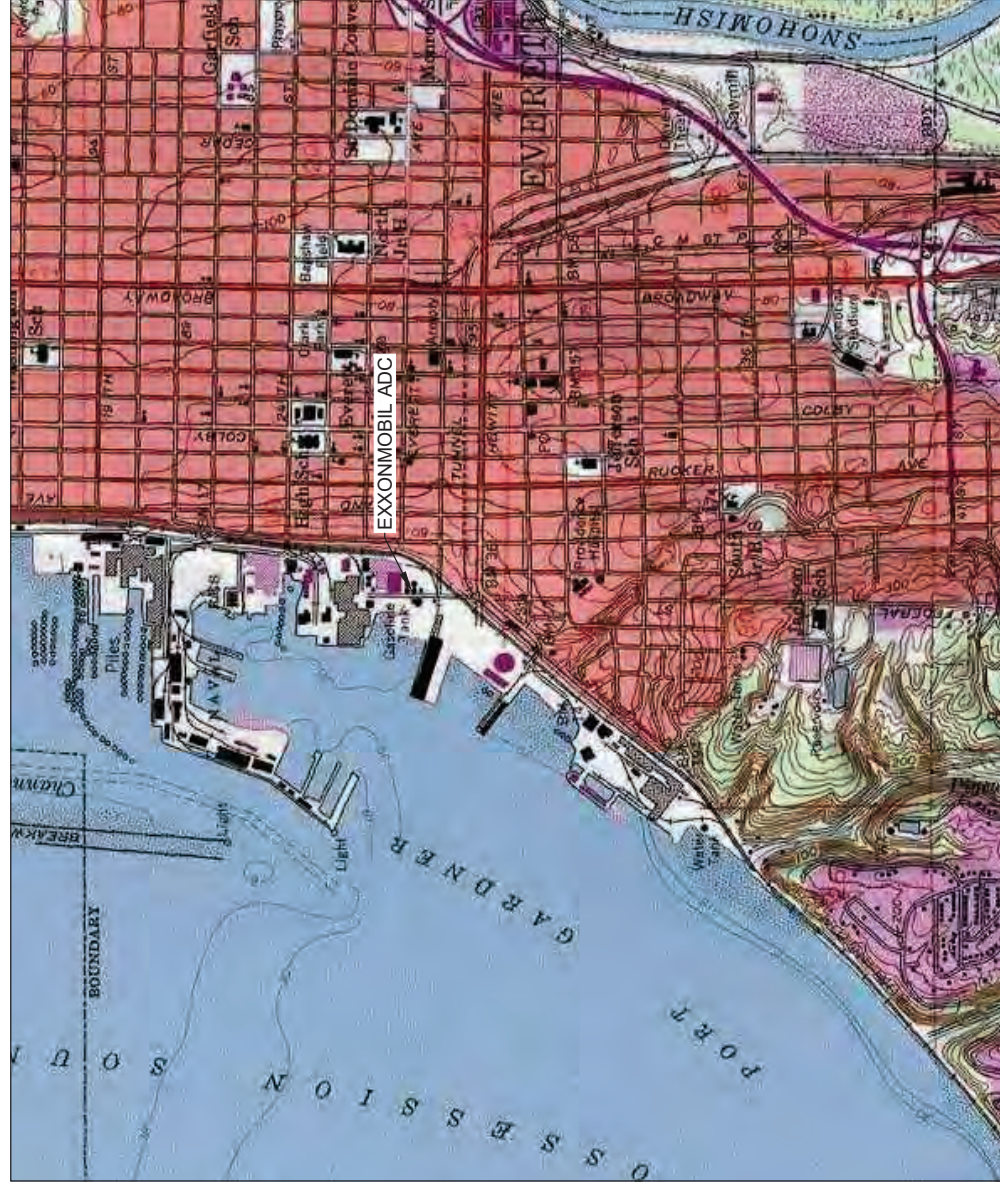
ELEMENT #12: MANAGE THE PROJECT
 BMP C'150: MATERIALS ON HAND
 BMP C'160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD

ELEMENT #13: PROTECT LOW IMPACT DEVELOPMENT
 NO EXISTING LID ELEMENTS ON SITE.



PROJECT NO. 238000337.R15		C-2		TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN		Sheet C2	
PK	TITLE SHEET	01/13/24	01/13/24	EXXONMOBIL ADC 2717 AND 2731 Federal Avenue Everett, Washington			
LAST REVISION DATE	DATE	06/24/23	01/13/24	Scale: 1" = 40"			
DATE	APPROVED	01/13/24	01/13/24	DRAWN: JYOTISMA PADLA LESLIE HUBLEY			

EXXONMOBIL ADC REMEDIAL EXCAVATION EVERETT, WASHINGTON



DRAWING LIST:

- Sheet 1: TITLE SHEET
- Sheet 2: P-1 PROJECT AREA PLAN
- Sheet 3: P-2 PROJECT AREA PLAN WITH UTILITIES
- Sheet 4: P-3 EXAMPLE STAGING PLAN
- Sheet 5: C-1 EXCAVATION PLAN
- Sheet 6: C-2 EXCAVATION SECTION
- Sheet 7: C-3 BACKFILL SECTION
- Sheet 8: C-4 PAVING PLAN

SCOPE OF WORK:

Excavate and remove approximately 17,500 cubic yards of material to a depth of 20 feet below ground surface (bgs), with the water table at a depth of approximately 5 feet bgs. Backfill and restore surface following excavation.

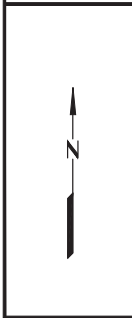
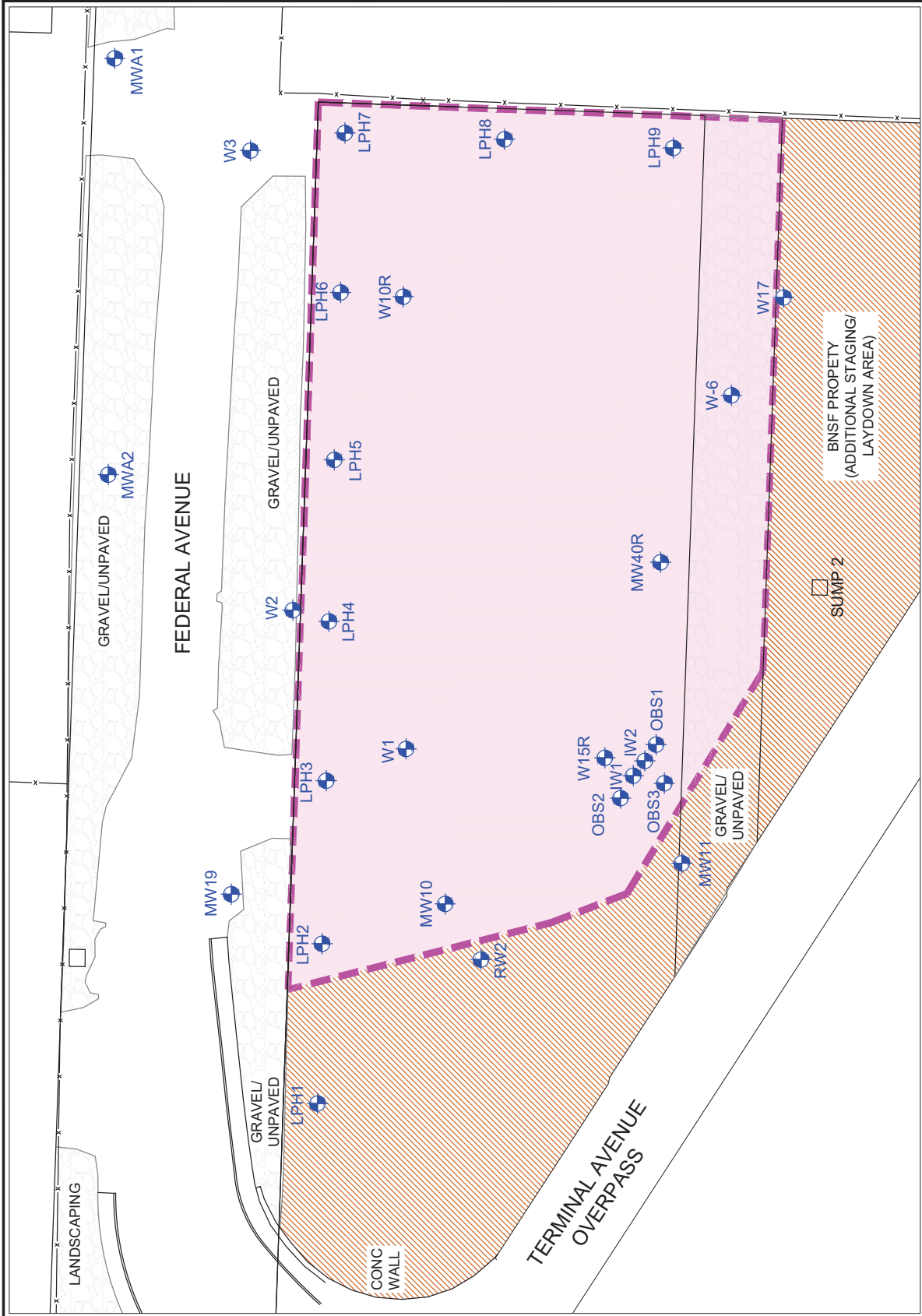


PROJECT NO.	203722941
DATE	05/16/23
DRAWN	LANA ODLE
APPROVED	BOBBY THOMPSON

NO.	DATE	REVISIONS
1	05/16/23	

DRAWING	
TITLE SHEET	
SCALE: 1" = 60'	

REMEDIAL EXCAVATION	Sheet 1
EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington	



EXPLANATION	
MWA3	Groundwater Monitoring Well
GB9	Geotechnical Soil Boring
	Excavation Extents
	Additional Staging/Laydown Area

NOTES

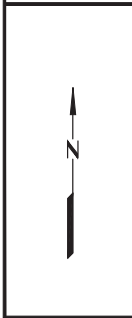
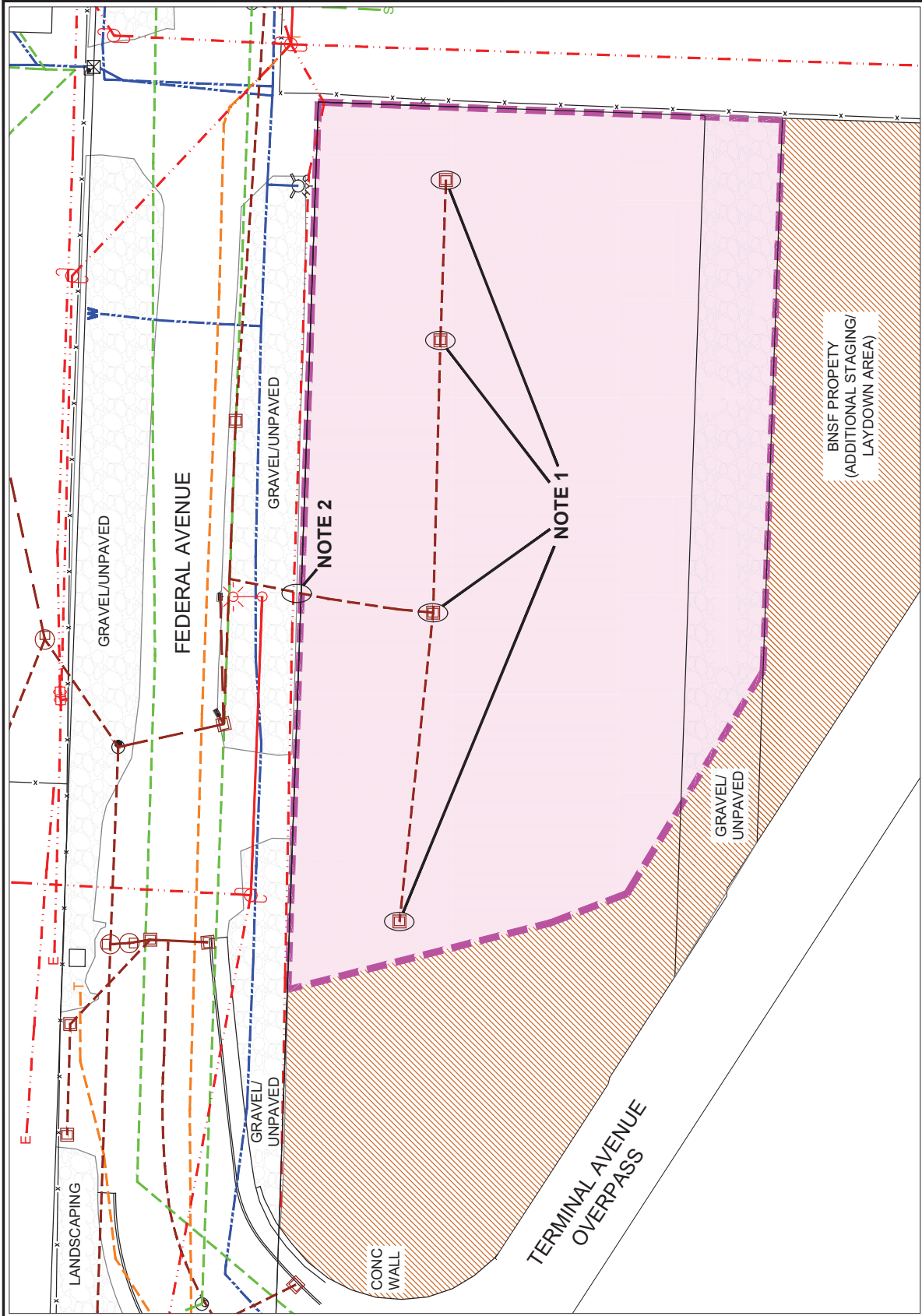
1. STANTEC TO CONTRACT THE DECOMMISSIONING OF ALL MONITORING WELLS LOCATED WITHIN THE FOOTPRINT OF THE EXCAVATION OR SHORING WALL PRIOR TO PROJECT EXECUTION.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO.	203722941
FN	203722941-RPP
LAST REV. DATE:	05/22/23
DATE	05/22/23
DRIVER	LANA COLE
APPROVED	BOBBY THOMPSON

NO.	DATE	REVISIONS
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2		
1	05/22/23	
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EXPLANATION

- Excavation Extents
- Additional Staging/Laydown Area

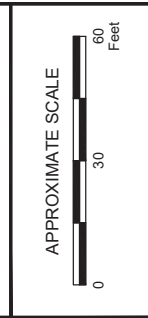
UTILITIES LEGEND

- TELEPHONE
- ELECTRICAL
- WATER
- STORM DRAIN
- SEWER

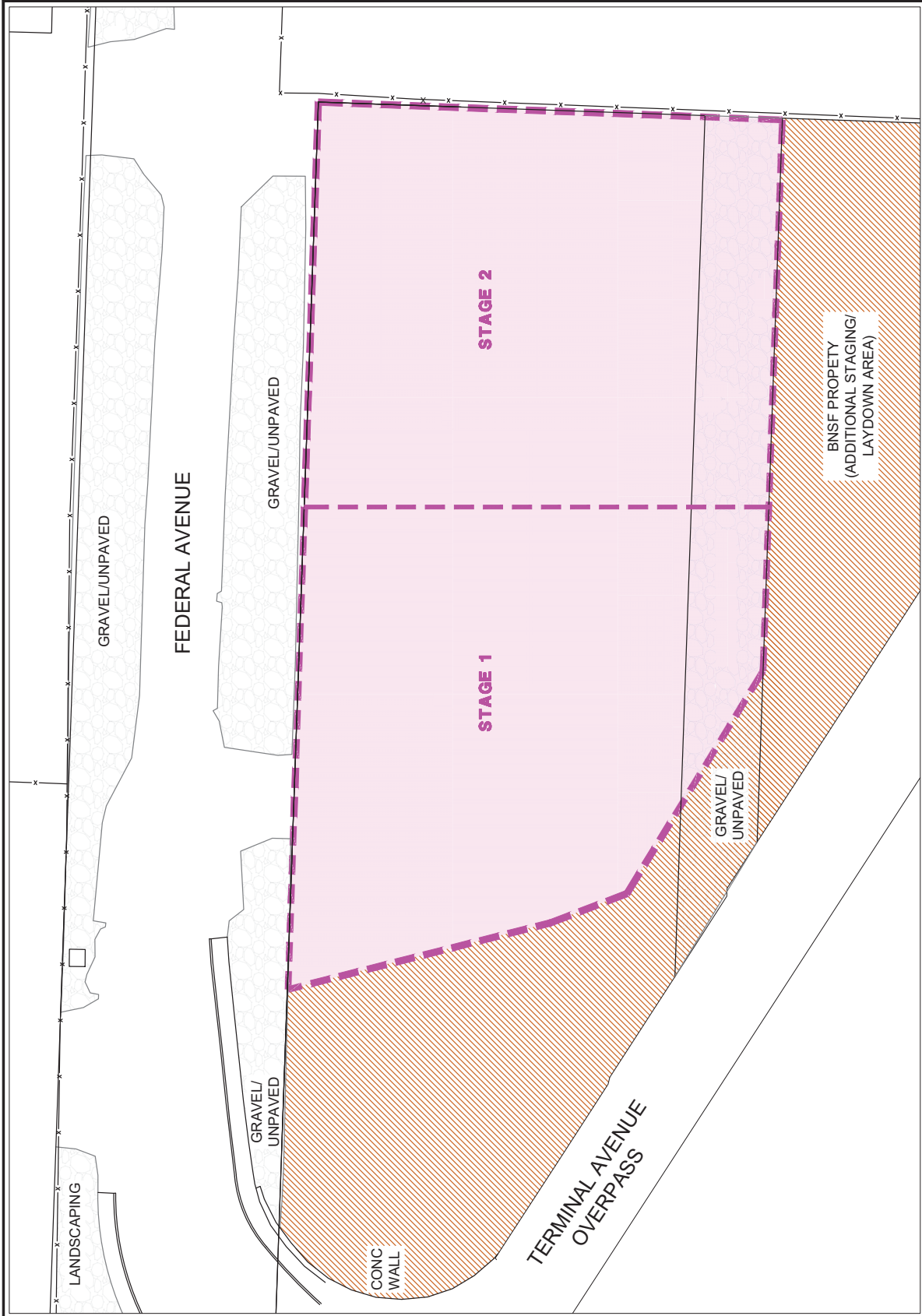
NOTES

- CONTRACTOR TO REMOVE FOUR (4) STORM DRAINS LOCATED WITHIN THE EXCAVATION FOOTPRINT FOR PROJECT EXCAVATION AND REPLACE FOUR (4) STORM DRAINS UPON COMPLETION OF PROJECT. CONTRACTOR TO CAP ONE 15-INCH STORM LINE FOR PROJECT EXECUTION AND RECONNECT UPON COMPLETION OF PROJECT.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941	DATE 05/22/23	SCALE 1" = 30'	P-2	Sheet 3												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>REVISIONS</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>05/22/23</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	DATE	REVISIONS	1	05/22/23		2			3			<p>PROJECT AREA PLAN WITH UTILITIES</p> <p>EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington</p>		
NO.	DATE	REVISIONS														
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<p>DRIVER: LANA COLE APPROVED: BOBBY THOMPSON</p>																



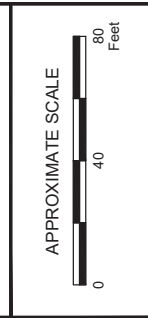
EXPLANATION

- Excavation Extents
- Additional Staging/Laydown Area

NOTES

- TBD.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941		DRAWING	
FN 203722941-RPP	NO. 0	DATE 05/22/23	REVISIONS
LAST REV. DATE: 05/22/23	DRAWN: LAVIA COLE	SCALE: 1"= 40'	
DATE: 05/22/23	APPROVED: BOBBY THOMPSON		

P-3

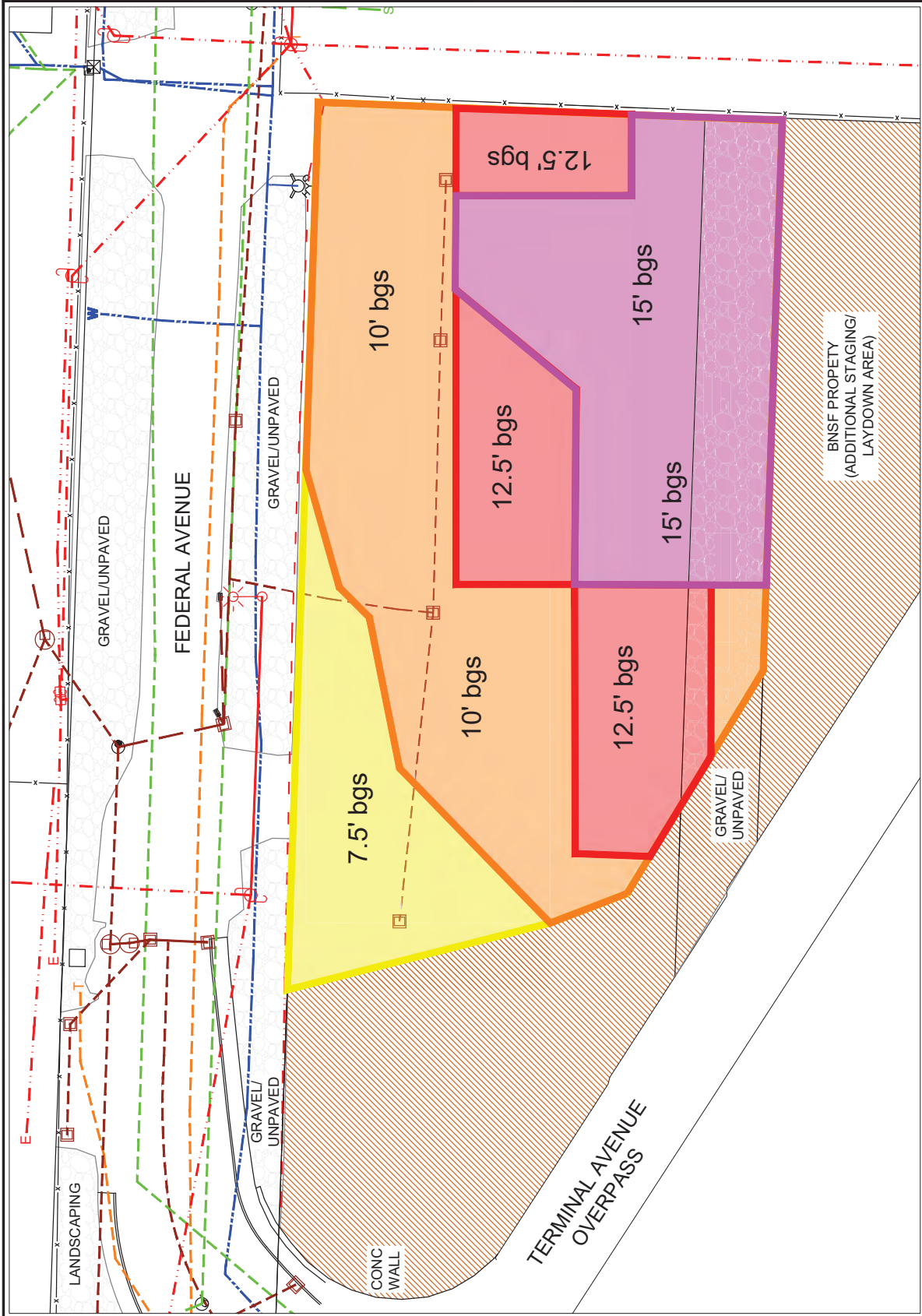
EXAMPLE STAGING PLAN

BNSF PROPERTY
(ADDITIONAL STAGING/
LAYDOWN AREA)

Sheet 4

Stantec

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington



EXPLANATION

- Excavation Extents
- Additional Staging/Laydown Area

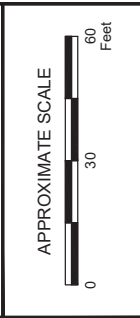
UTILITIES LEGEND

- TELEPHONE
- ELECTRICAL
- WATER
- STORM DRAIN
- SEWER

NOTES

- TBD.

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941		DRAWING	
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LAST REV. DATE: 05/22/23	DRAWN: LANA COLE	SCALE: 1" = 30'	
DATE: 05/22/23	APPROVED: BOBBY THOMPSON		

C-1

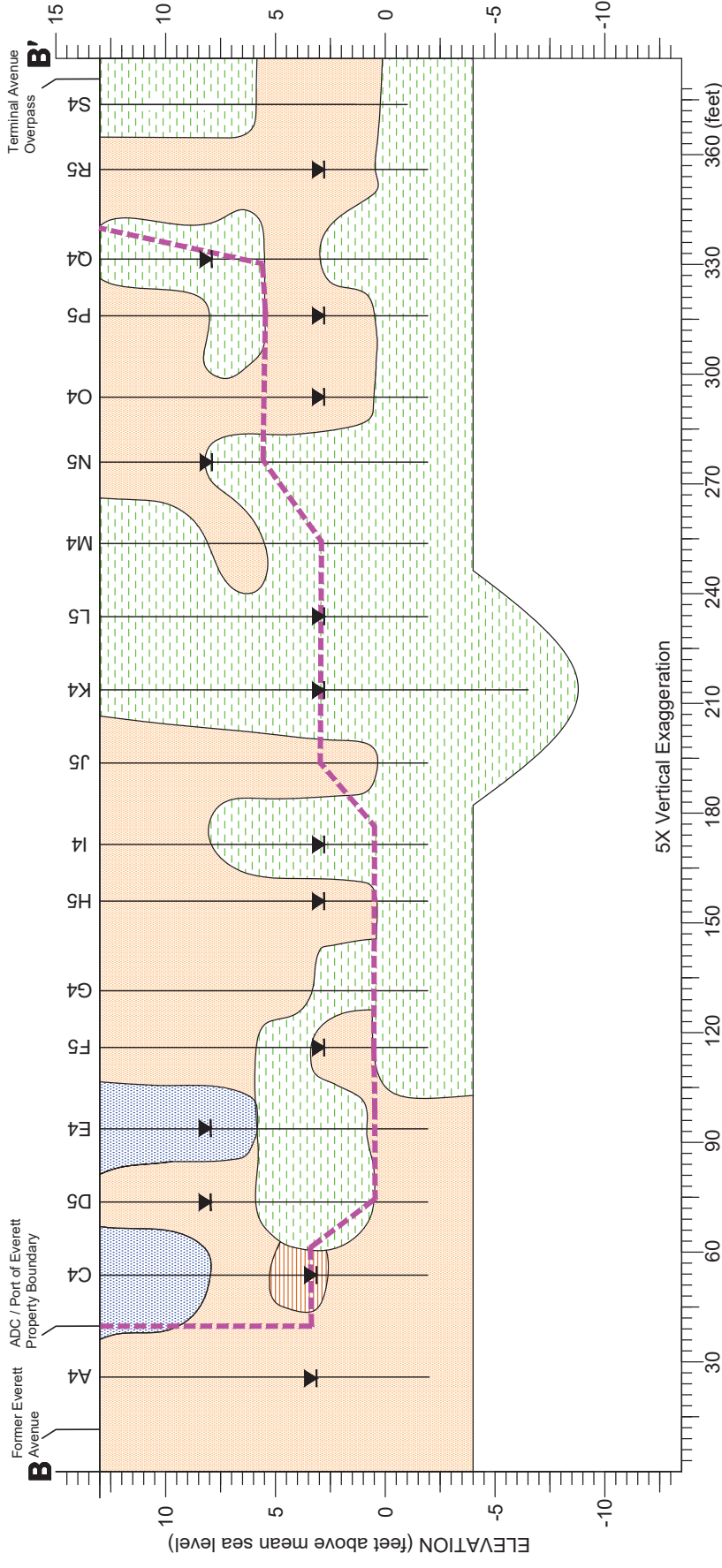
EXCAVATION PLAN

EXXONMOBIL.ADC
2717/2731 Federal Avenue
Everett, Washington

Sheet 5

N

S



EXPLANATION

- ▲ Water Level Encountered During Drilling
- Excavation Limits

LITHOLOGY

- Coarse-grained Gravelly Sediments (GW, GP, GC)
- Coarse-grained Sandy Sediments (SW, SP, SM, SC)
- Fine-grained Sediments (CL, ML)
- Organic Sediments (Wood Debris)

PROJECT NO.	203722941
FN	203722941-RPP
LAST REV. DATE	05/22/23
DATE	05/22/23
DRAWN	LANA COLE
APPROVED	BOBBY THOMPSON

REVISIONS	SCALE: 1" = 30'

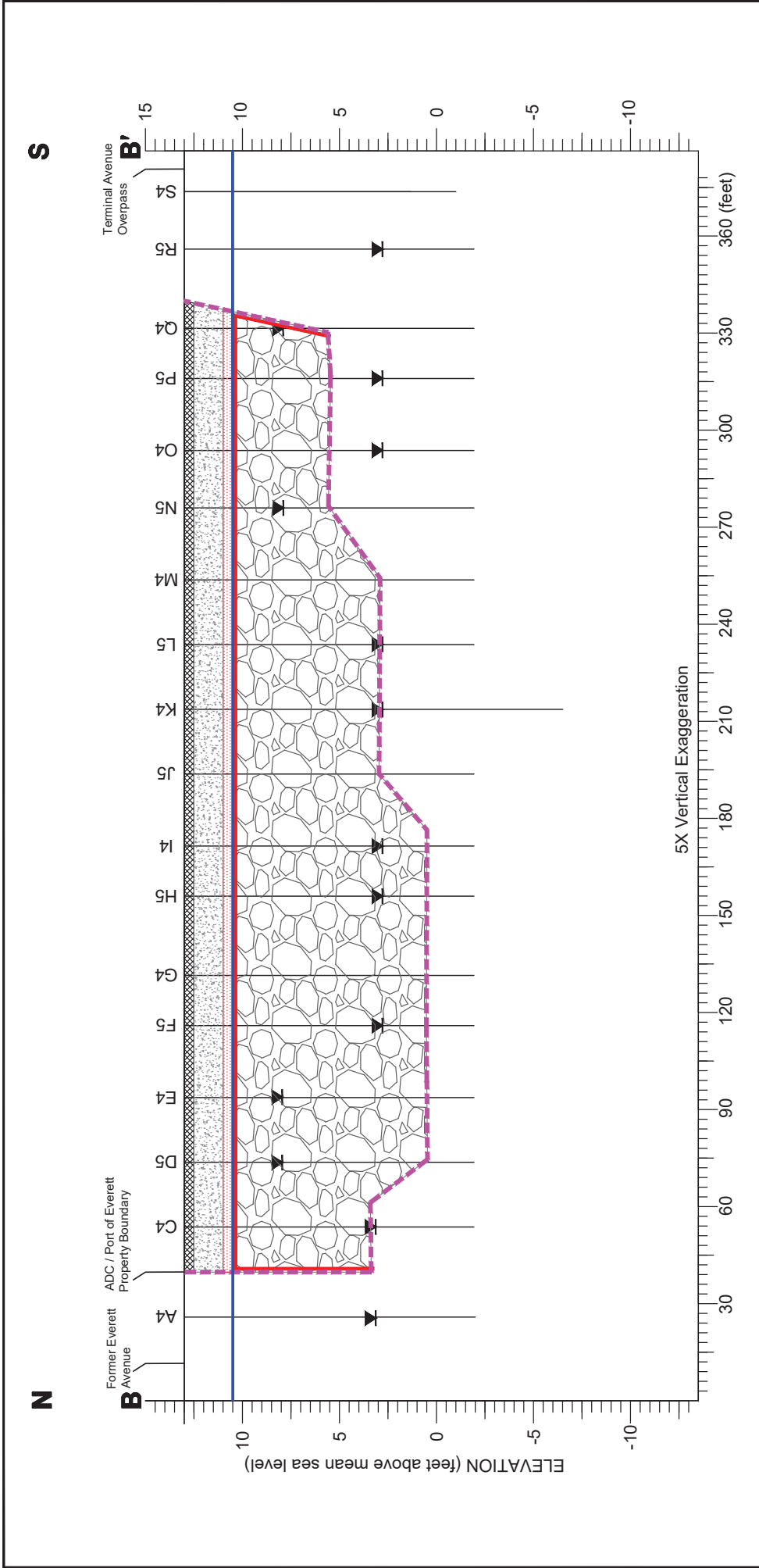
C-2

EXCAVATION SECTION

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

Sheet 6





EXPLANATION

- Water Level Encountered During Drilling
- Excavation Limits
- Approximate Static Water Level
- Geotextile fabric to be placed along sides and top of backfill below water table

BACKFILL MATERIALS

- 3/4-inch Class HMA
- Aggregate Base
- Subbase Above Water Table
- (AASHTO No. 57 or Equivalent) Below Water Table

NOTE: REFER TO TECHNICAL SPECIFICATIONS FOR DETAILS ON BACKFILL MATERIALS AND PLACEMENT

PROJECT NO. **203722941**

FN 203722941-RPP

LAST REV. DATE: 05/22/23

DATE: 05/22/23

DRIVING: LAVIA COLE

APPROVED: BOBBY THOMPSON

REVISIONS

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SCALE: 1" = 30'

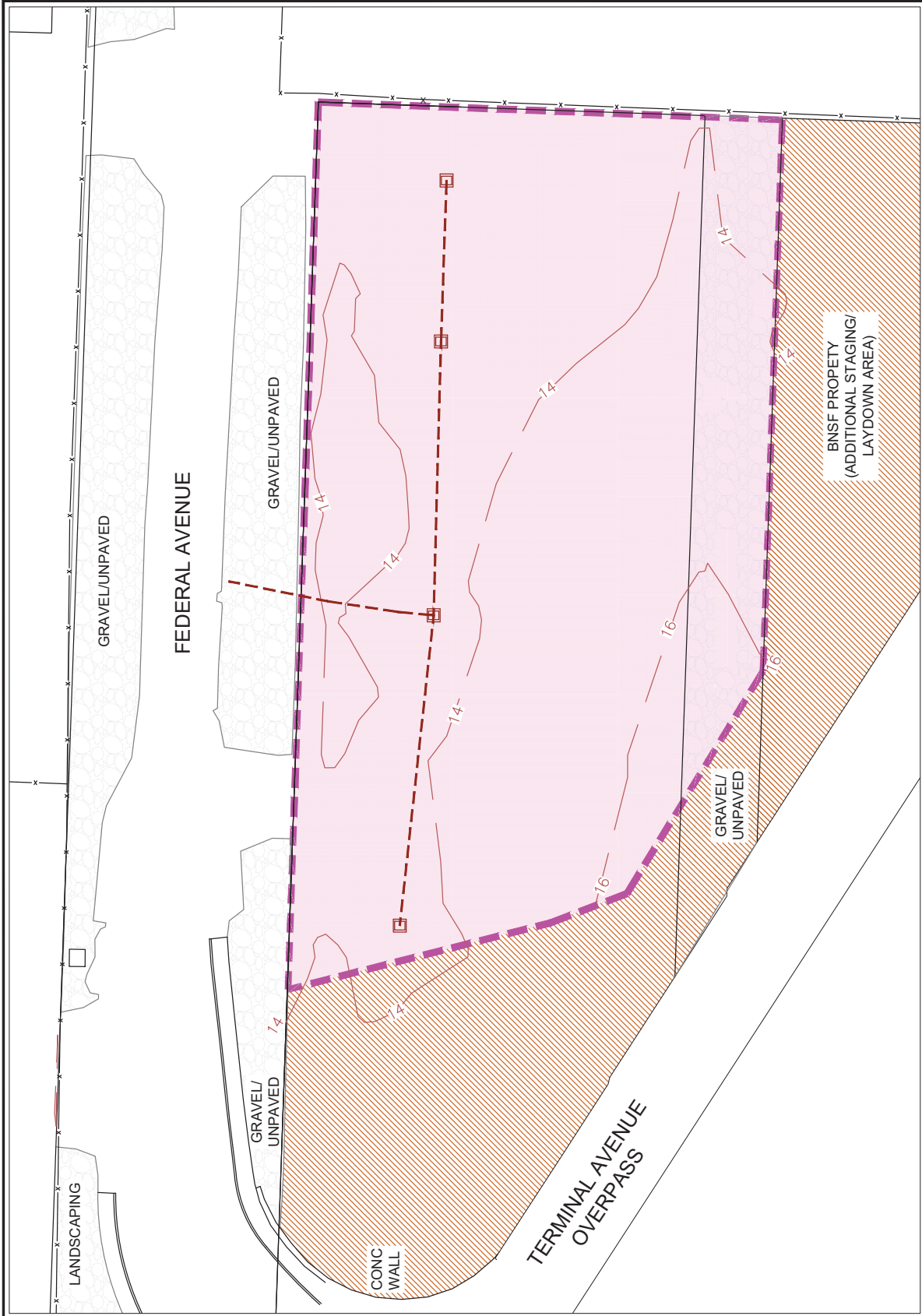
C-3

BACKFILL SECTION

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

Sheet 7

Stantec



EXPLANATION

- Topographic Lines
- Excavation Extents
- Additional Staging/Laydown Area

UTILITIES LEGEND

- STORM DRAIN

NOTES

1. CONTRACTOR TO REPLACE FOUR (4) STORM DRAINS UPON COMPLETION OF PROJECT.

SOURCE: Modified by maps provided by ASP1, LLC

APPROXIMATE SCALE



PROJECT NO.	203722941
FN	203722941-RPP
LAST REV. DATE	05/22/23
DATE	05/22/23
DRAWN	LANA COLE
APPROVED	BOBBY THOMPSON
REVISIONS	
NO.	DATE
1	05/22/23
2	
3	

DRAWING

C-4

PAVING PLAN

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

Sheet 8



Appendix B: Department of Ecology 2019 SWMMWW BMP Descriptions

Insert BMPs specification sheets here.

Download BMPs from the Ecology Construction Stormwater website at:

<https://www.ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals>

Maintenance Standards

If the fence has been damaged or visibility reduced, it shall be repaired or replaced immediately and visibility restored.

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.

**Table II-3.2: Stabilized Construction Access
Geotextile Standards (continued)**

Geotextile Property	Required Value
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 C 103: 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

**Table II-3.3: Stabilized
Construction Access
Alternative Material
Requirements
(continued)**

Sieve Size	Percent Passing
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.

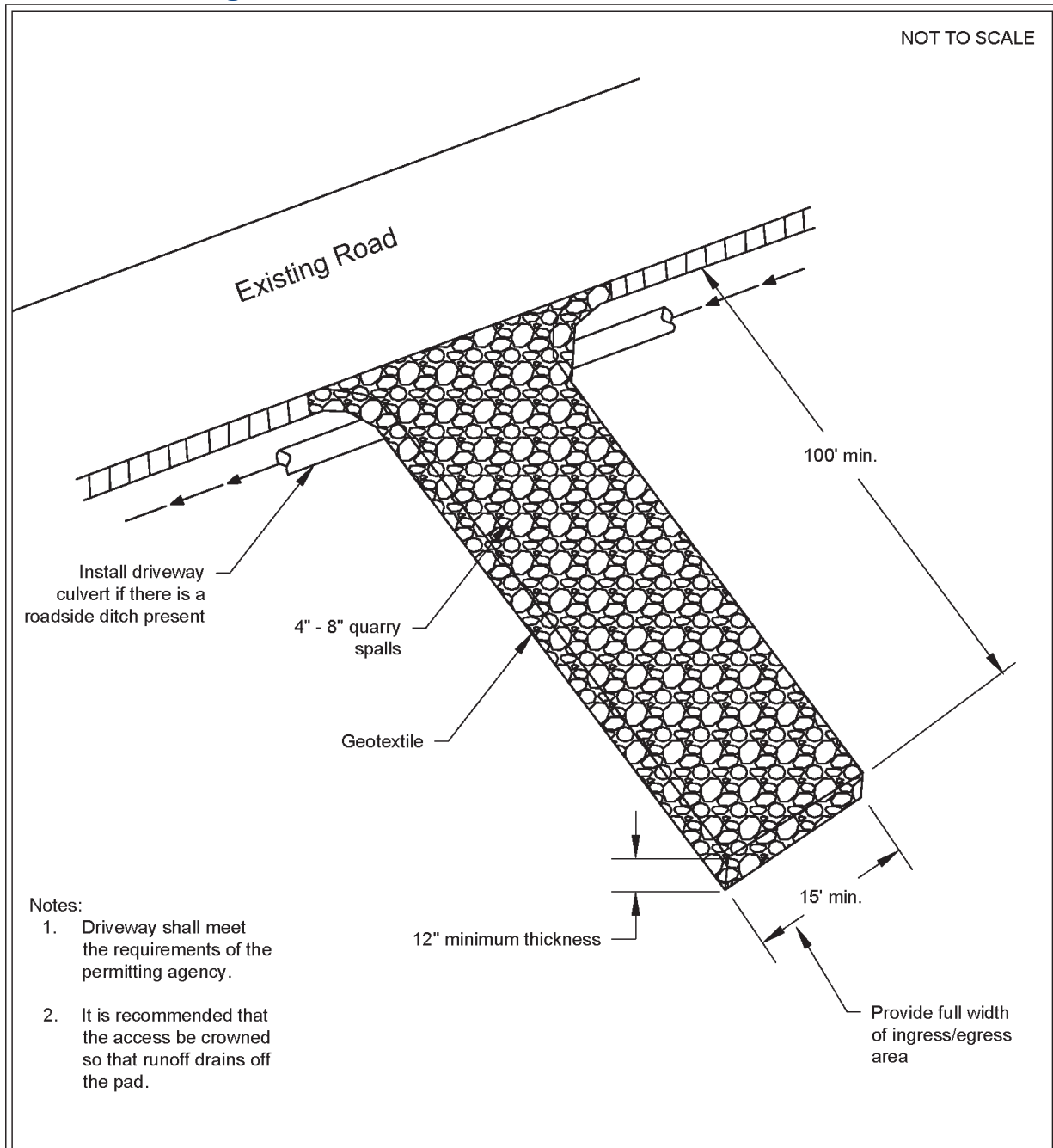
Maintenance Standards

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 C 106: 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 C 103: 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

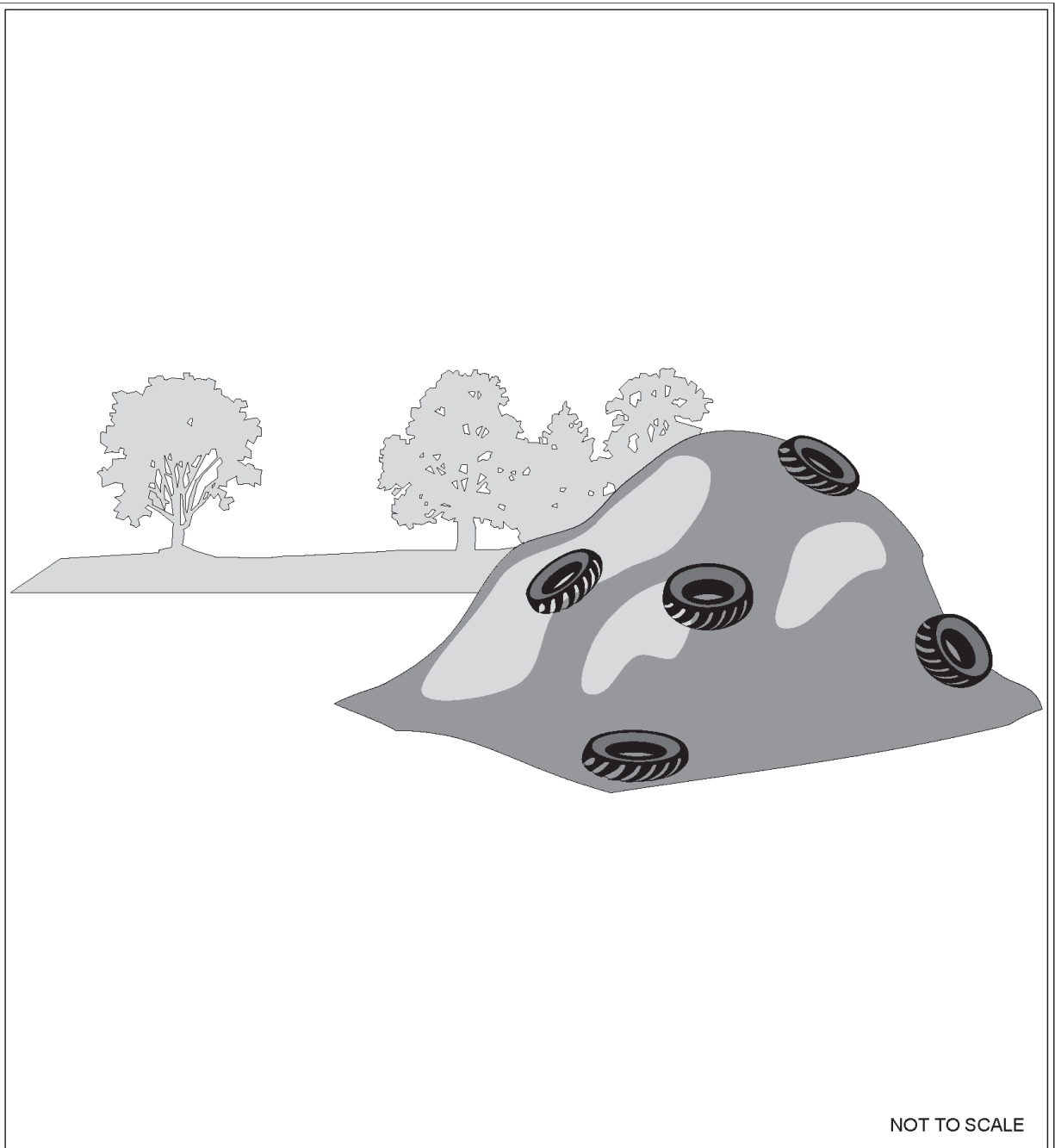


Stabilized Construction Access

Revised June 2018

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Figure IV-5.7: Material Covered with Plastic Sheet



NOT TO SCALE



Material Covered with Plastic Sheet

Revised June 2016

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Figure II-3.4: Slope Installation

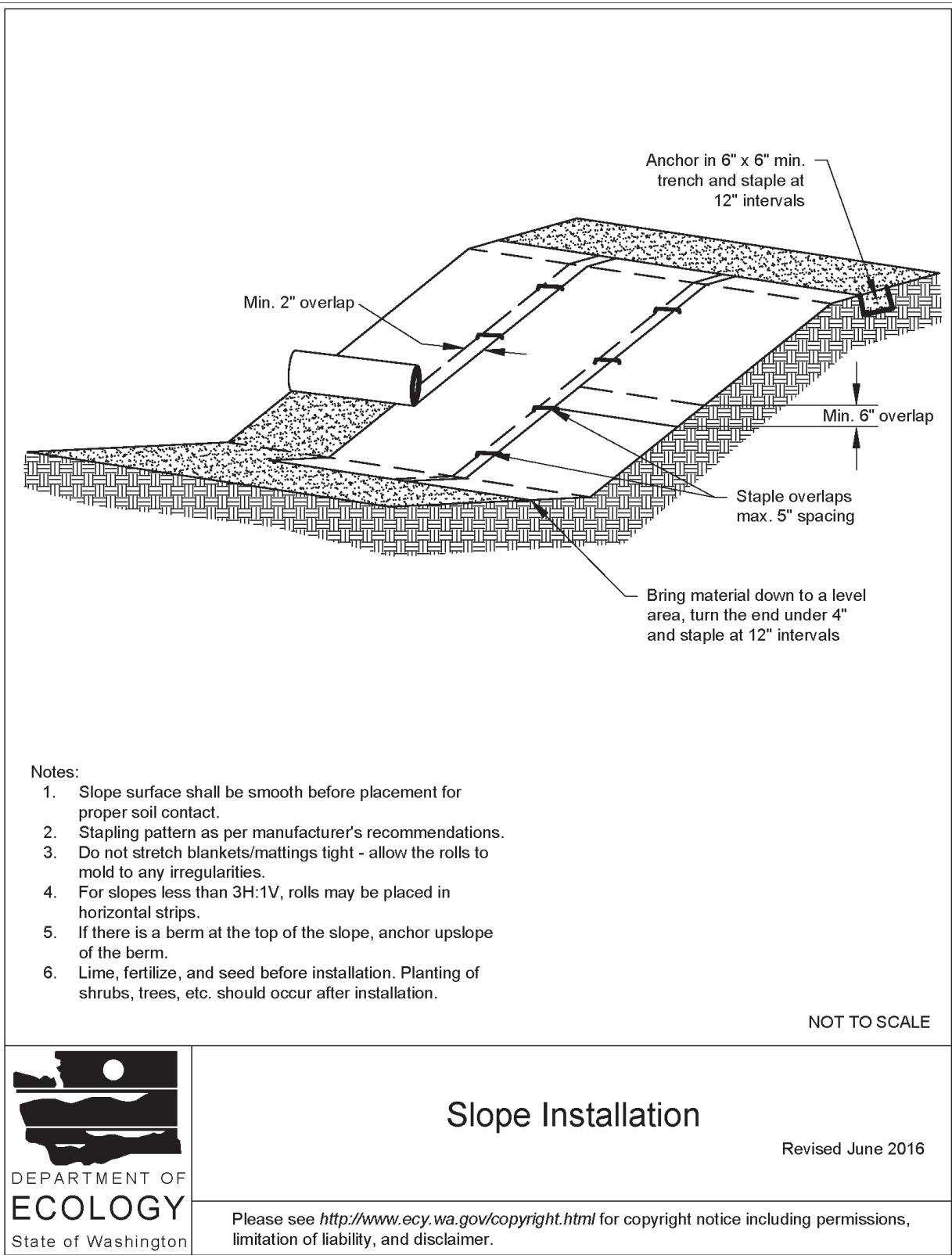
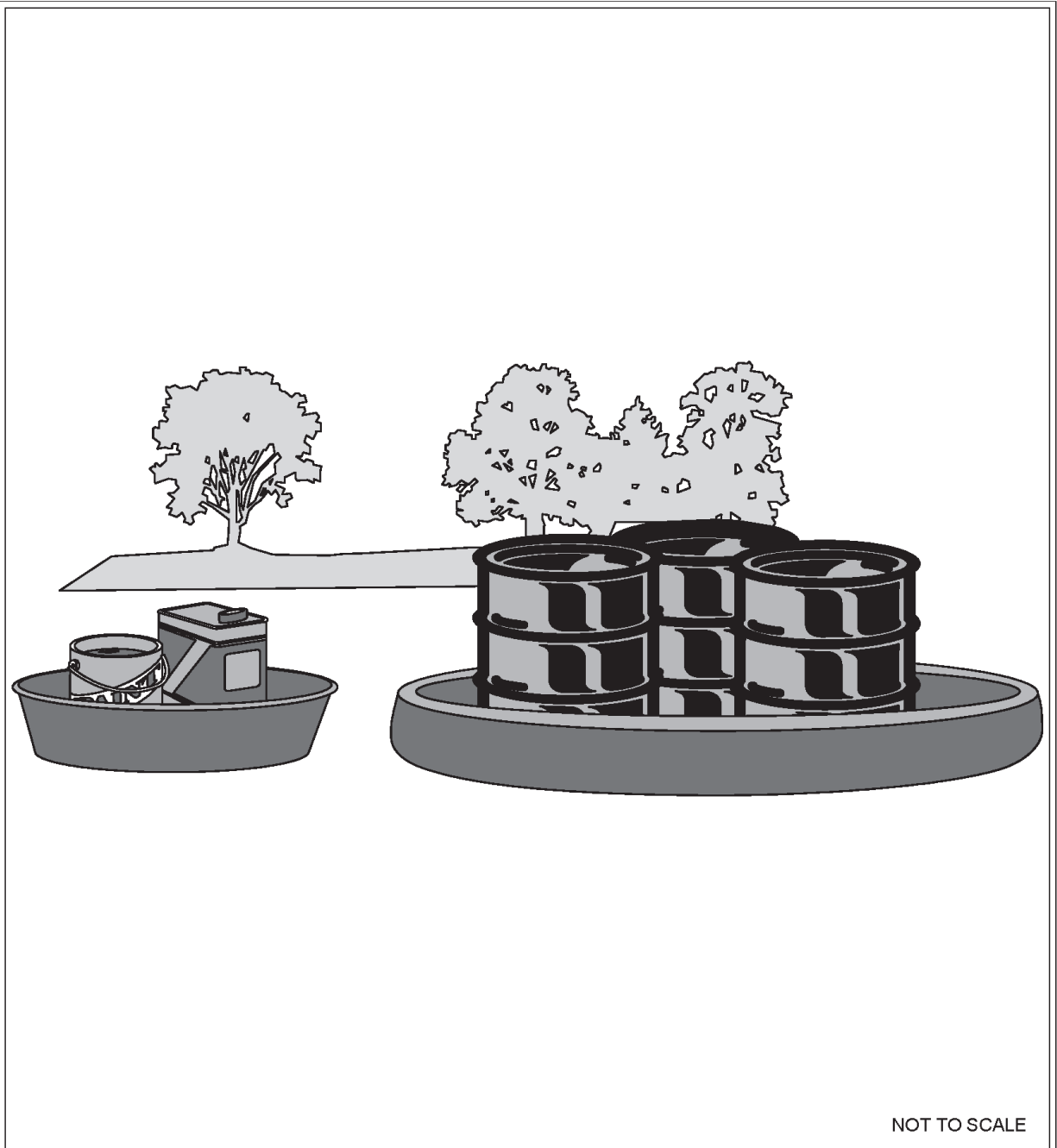


Figure IV-5.1: Secondary Containment System



Secondary Containment System

Revised June 2016

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Appendix C: Correspondence

Ecology

See Appendix G document correspondence for Contaminated Site Information

EPA

None applicable

Local Government (City of Everett)

Discharge Authorization No. MD-46-2023



June 9th, 2023

Stantec Consulting Services Inc.
309 South Cloverdale Street, Unit A13
Seattle, WA 98108

Subject: EXXONMobil ADC
Discharge Permit Construction Activities

Dear Mrs. Cole

Stantec is hereby authorized to discharge site related water from site remediation. Discharge will be allowed for the permit duration. The discharge will be approved upon the City's receipt of the signed acceptance of this letter and all requirements as listed herein have been met. No other water sources are allowed to be discharged under this authorization, other than what is listed above.

This authorization is based on the information you provided; we understand that this work is ongoing. Discharge will be allowed based on compliance with the conditions of this authorization and Sewer System Operations.

The point of discharge will be within the city's sewer collection system as directed by Fred Rapelyea and as shown on the attached Map

You will be billed for the amount discharged to the city sewers based on the total flow. Your sewer bill will be invoiced monthly and will be calculated on our current sewer rate (currently \$9.25 per 100 cubic feet) plus the industrial surcharge of \$0.19 per thousand gallons of flow.


You must meter and track the amount discharged to the city sewers. You must also always know the approximate flow rate, as we will need to know especially during wet weather conditions

This Discharge Authorization is issued with the following conditions:

- 1) You must comply with the general use and discharge requirements of the Industrial Pretreatment Ordinance #3070-08 as amended (attached), as well as any applicable Federal and State regulations.
- 2) The City solely reserves the right to modify, suspend, or terminate this authorization at any time once issued.
- 3) Your representative and point of contact for discharge is Fred Rapelyea at 425-257-8828 (cell at 425-583-7796) or frapelyea@everettwa.gov. You shall notify Fred prior to discharge and when your project is completed. You must also report monthly flows to frapelyea@everettwa.gov.
- 4) Discharge can only occur during non-rain impacted flow periods. Your point of contact will receive notification to immediately stop discharging within 30 minutes.

Public Works

 3200 Cedar Street
Everett, WA 98201

 425.257.8800
425.257.8882 fax

 everettpw@everettwa.gov
everettwa.gov/pw

- 5) The point of discharge shall be as shown on attached map or as directed by the City's project representative and limited to a flow of **150 gallons per minute or less**. Higher rates must be first approved by Fred Rapelyea and will only be approved for limited durations based on existing system conditions.
- 6) **Approved Discharge will only be for water related to construction at the specific location identified in the DA application. Other sources must be pre-approved and may require a separate application and sampling.**
- 7) All flow shall be routed through a system designed to remove floatable particles and settleable solids or discharge must be free of floatable and settleable solids. Highland Civil or representatives shall monitor and prevent any floatable and settleable solids in the discharge and shall use an onsite storage tank for pre-settlement needs related to high sediment or turbidity prior to discharge to the City's sewers. The City will inspect the tank and volume prior to discharge; with the ability and permission to inspect during the work as needed. Contact Fred for inspection of the tank at least 24 hours in advance.
- 8) At any time, the City of Everett Representative can direct the point of discharge to an alternative location based on system operations.
- 9) Discharge operations shall comply with the City's Noise Ordinance and all existing permitted requirements as set forth by the City of Everett's Permitting Services
- 10) **Stantec** or representatives are solely responsible for spills of any kind related to their discharge operations, including reporting to Department of Ecology, clean-up, and any repairs or restoration, including but not limited to all costs incurred by the City of Everett to oversee and respond to discharges that are not covered within the approved Discharge Authorization **No. MD-56-2023**
- 11) City of Everett personnel may take samples of the effluent for analysis and may inspect your site to verify compliance at any time.
- 12) Maximum rate of flow shall not cause capacity problems in the receiving sewer or at any point downstream of the discharge; the City may modify the flow rate at any time based on sewer system operations.
- 13) The discharge is subject to these limits:

As	0.5	mg/L
Cd	0.24	mg/L
Cr	5.0	mg/L
Cu	3.0	mg/L
Pb	1.9	mg/L
Hg	0.1	mg/L
Ni	2.83	mg/L
Ag	0.49	mg/L
Zn	4.0	mg/L
CN-	0.65	mg/L
Nonpolar FOG	200	mg/L

- Should additional lab samples indicate higher than allowed discharge limits, then a treatment plan to bring the discharge below the allowable limits will be required.



- All discharge data from the site shall be reported. The total amount of flow to the sanitary sewer shall be reported at the completion of the discharge event including all data collected. Please remit all reports to the following:

Fred Rapelyea
Sewer and Drainage
Maintenance & Operations Manager
City of Everett
3200 Cedar Street
Everett, WA 98201

- 14) The City reserves the right to bill Stantec fees for the requested monitoring, inspections, or sampling outside normal operating hours of 7:30am to 4:00pm.
- 15) Highland Civil must install an acceptable flow meter rated for the nature of the discharge to accurately monitor the flow rate of discharge and report the monthly volumes to Fred Rapelyea. Fred Rapelyea must inspect and approve the meter installation prior to discharge. The meter shall not be removed or replaced without notifying the City first. Highland Civil will **not exceed 150 gallons per minute** and must keep a log for the discharge volumes noted. The log and amount of flow must be submitted to Fred Rapelyea monthly and at the end of the project.

Please contact me at 425 257-8828 (frapelyea@everettwa.gov) if you have any questions or need clarification of the requirements and limits of this discharge agreement.

Sincerely,

Fred Rapelyea, PM
Maintenance & Operations Supervisor



Date: 06/09/2023

Accepted By:



Date: 06/09/2023

Attachment: Discharge Location Map

cc: Gene Bennett, City of Everett
Jeff Marrs City of Everett
Grant Moen City of Everett
Chron File
IPT File



Appendix D: Site Inspection Form

Construction Stormwater Site Inspection Form

Project Name _____ **Permit #** _____ **Inspection Date** _____ **Time** _____

Name of Certified Erosion Sediment Control Lead (CESCL) or qualified inspector if *less than one acre*

Print Name: _____

Approximate rainfall amount since the last inspection (in inches): _____

Approximate rainfall amount in the last 24 hours (in inches): _____

Current Weather Clear Cloudy Mist Rain Wind Fog

A. Type of inspection: Weekly Post Storm Event Other

B. Phase of Active Construction (check all that apply):

Pre Construction/installation of erosion/sediment controls	<input type="checkbox"/>	Clearing/Demo/Grading	<input type="checkbox"/>
Concrete pours	<input type="checkbox"/>	Vertical Construction/buildings	<input type="checkbox"/>
Offsite improvements	<input type="checkbox"/>	Site temporary stabilized	<input type="checkbox"/>
		Infrastructure/storm/roads	<input type="checkbox"/>
		Utilities	<input type="checkbox"/>
		Final stabilization	<input type="checkbox"/>

C. Questions:

- | | | | | |
|--|-----|----|-------|-------|
| 1. Were all areas of construction and discharge points inspected? | Yes | No | _____ | _____ |
| 2. Did you observe the presence of suspended sediment, turbidity, discoloration, or oil sheen | Yes | No | _____ | _____ |
| 3. Was a water quality sample taken during inspection? (<i>refer to permit conditions S4 & S5</i>) | Yes | No | _____ | _____ |
| 4. Was there a turbid discharge 250 NTU or greater, or Transparency 6 cm or less?* | Yes | No | _____ | _____ |
| 5. If yes to #4 was it reported to Ecology? | Yes | No | _____ | _____ |
| 6. Is pH sampling required? pH range required is 6.5 to 8.5. | Yes | No | _____ | _____ |

If answering yes to a discharge, describe the event. Include when, where, and why it happened; what action was taken, and when.

*If answering yes to # 4 record NTU/Transparency with continual sampling daily until turbidity is 25 NTU or less/ transparency is 33 cm or greater.

Sampling Results: _____ Date: _____

Parameter	Method (circle one)	Result			Other/Note
		NTU	cm	pH	
<i>Turbidity</i>	tube, meter, laboratory				
<i>pH</i>	Paper, kit, meter				

Construction Stormwater Site Inspection Form

D. Check the observed status of all items. Provide "Action Required" details and dates.

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
1 Clearing Limits	Before beginning land disturbing activities are all clearing limits, natural resource areas (streams, wetlands, buffers, trees) protected with barriers or similar BMPs? (high visibility recommended)						
2 Construction Access	Construction access is stabilized with quarry spalls or equivalent BMP to prevent sediment from being tracked onto roads?						
	Sediment tracked onto the road way was cleaned thoroughly at the end of the day or more frequent as necessary.						
3 Control Flow Rates	Are flow control measures installed to control stormwater volumes and velocity during construction and do they protect downstream properties and waterways from erosion?						
	If permanent infiltration ponds are used for flow control during construction, are they protected from siltation?						
4 Sediment Controls	All perimeter sediment controls (e.g. silt fence, wattles, compost socks, berms, etc.) installed, and maintained in accordance with the Stormwater Pollution Prevention Plan (SWPPP).						
	Sediment control BMPs (sediment ponds, traps, filters etc.) have been constructed and functional as the first step of grading.						
	Stormwater runoff from disturbed areas is directed to sediment removal BMP.						
5 Stabilize Soils	Have exposed un-worked soils been stabilized with effective BMP to prevent erosion and sediment deposition?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
5 Stabilize Soils Cont.	Are stockpiles stabilized from erosion, protected with sediment trapping measures and located away from drain inlet, waterways, and drainage channels?						
	Have soils been stabilized at the end of the shift, before a holiday or weekend if needed based on the weather forecast?						
6 Protect Slopes	Has stormwater and ground water been diverted away from slopes and disturbed areas with interceptor dikes, pipes and or swales?						
	Is off-site storm water managed separately from stormwater generated on the site?						
	Is excavated material placed on uphill side of trenches consistent with safety and space considerations?						
	Have check dams been placed at regular intervals within constructed channels that are cut down a slope?						
7 Drain Inlets	Storm drain inlets made operable during construction are protected.						
	Are existing storm drains within the influence of the project protected?						
8 Stabilize Channel and Outlets	Have all on-site conveyance channels been designed, constructed and stabilized to prevent erosion from expected peak flows?						
	Is stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes and downstream conveyance systems?						
9 Control Pollutants	Are waste materials and demolition debris handled and disposed of to prevent contamination of stormwater?						
	Has cover been provided for all chemicals, liquid products, petroleum products, and other material?						
	Has secondary containment been provided capable of containing 110% of the volume?						
	Were contaminated surfaces cleaned immediately after a spill incident?						
	Were BMPs used to prevent contamination of stormwater by a pH modifying sources?						

Construction Stormwater Site Inspection Form

Element #	Inspection	BMPs Inspected			BMP needs maintenance	BMP failed	Action required (describe in section F)
		yes	no	n/a			
9 Cont.	Wheel wash wastewater is handled and disposed of properly.						
10 Control Dewatering	Concrete washout in designated areas. No washout or excess concrete on the ground.						
	Dewatering has been done to an approved source and in compliance with the SWPPP.						
	Were there any clean non turbid dewatering discharges?						
11 Maintain BMP	Are all temporary and permanent erosion and sediment control BMPs maintained to perform as intended?						
12 Manage the Project	Has the project been phased to the maximum degree practicable?						
	Has regular inspection, monitoring and maintenance been performed as required by the permit?						
	Has the SWPPP been updated, implemented and records maintained?						
13 Protect LID	Is all Bioretention and Rain Garden Facilities protected from sedimentation with appropriate BMPs?						
	Is the Bioretention and Rain Garden protected against over compaction of construction equipment and foot traffic to retain its infiltration capabilities?						
	Permeable pavements are clean and free of sediment and sediment laden-water runoff. Muddy construction equipment has not been on the base material or pavement.						
	Have soiled permeable pavements been cleaned of sediments and pass infiltration test as required by stormwater manual methodology?						
	Heavy equipment has been kept off existing soils under LID facilities to retain infiltration rate.						

E. Check all areas that have been inspected. ✓

All in place BMPs All disturbed soils All concrete wash out area All material storage areas
 All discharge locations All equipment storage areas All construction entrances/exits

Construction Stormwater Site Inspection Form

F. Elements checked "Action Required" (section D) describe corrective action to be taken. List the element number; be specific on location and work needed. Document, initial, and date when the corrective action has been completed and inspected.

Element #	Description and Location	Action Required	Completion Date	Initials

Attach additional page if needed

Sign the following certification:

"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: _____

Appendix E: Construction Stormwater General Permit (CSWGP)

Issuance Date: November 18, 2020
Effective Date: January 1, 2021
Expiration Date: December 31, 2025

CONSTRUCTION STORMWATER GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge
General Permit for Stormwater Discharges Associated with Construction Activity

State of Washington
Department of Ecology
Olympia, Washington 98504

In compliance with the provisions of
Chapter 90.48 Revised Code of Washington
(State of Washington Water Pollution Control Act)
and
Title 33 United States Code, Section 1251 et seq.
The Federal Water Pollution Control Act (The Clean Water Act)

Until this permit expires, is modified, or revoked, Permittees that have properly
obtained coverage under this general permit are authorized to discharge in accordance
with the special and general conditions that follow.



Vincent McGowan, P.E.
Water Quality Program Manager
Washington State Department of Ecology

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SUMMARY OF PERMIT REPORT SUBMITTALS

Refer to the Special and General Conditions within this permit for additional submittal requirements. Appendix A provides a list of definitions. Appendix B provides a list of acronyms.

Table 1 Summary of Required Submittals

Permit Section	Submittal	Frequency	First Submittal Date
S5.A and S8	High Turbidity/Transparency Phone Reporting	As Necessary	Within 24 hours
S5.B	Discharge Monitoring Report	Monthly*	Within 15 days following the end of each month
S5.F and S8	Noncompliance Notification – Telephone Notification	As necessary	Within 24 hours
S5.F	Noncompliance Notification – Written Report	As necessary	Within 5 Days of non-compliance
S9.D	Request for Chemical Treatment Form	As necessary	Written approval from Ecology is required prior to using chemical treatment (with the exception of dry ice, CO ₂ or food grade vinegar to adjust pH)
G2	Notice of Change in Authorization	As necessary	
G6	Permit Application for Substantive Changes to the Discharge	As necessary	
G8	Application for Permit Renewal	1/permit cycle	No later than 180 days before expiration
S2.A	Notice of Permit Transfer	As necessary	
G19	Notice of Planned Changes	As necessary	
G21	Reporting Anticipated Non-compliance	As necessary	

NOTE: *Permittees must submit electronic Discharge Monitoring Reports (DMRs) to the Washington State Department of Ecology monthly, regardless of site discharge, for the full duration of permit coverage. Refer to Section S5.B of this General Permit for more specific information regarding DMRs.

Table 2 Summary of Required On-site Documentation

Document Title	Permit Conditions
Permit Coverage Letter	See Conditions S2, S5
Construction Stormwater General Permit (CSWGP)	See Conditions S2, S5
Site Log Book	See Conditions S4, S5
Stormwater Pollution Prevention Plan (SWPPP)	See Conditions S5, S9
Site Map	See Conditions S5, S9

SPECIAL CONDITIONS

S1. PERMIT COVERAGE

A. Permit Area

This Construction Stormwater General Permit (CSWGP) covers all areas of Washington State, except for federal operators and Indian Country as specified in Special Condition S1.E.3 and 4.

B. Operators Required to Seek Coverage Under this General Permit

1. Operators of the following construction activities are required to seek coverage under this CSWGP:
 - a. Clearing, grading and/or excavation that results in the disturbance of one or more acres (including off-site disturbance acreage related to construction-support activity as authorized in S1.C.2) and discharges stormwater to surface waters of the State; and clearing, grading and/or excavation on sites smaller than one acre that are part of a larger common plan of development or sale, if the common plan of development or sale will ultimately disturb one acre or more and discharge stormwater to surface waters of the State.
 - i. This category includes forest practices (including, but not limited to, class IV conversions) that are part of a construction activity that will result in the disturbance of one or more acres, and discharge to surface waters of the State (that is, forest practices that prepare a site for construction activities); and
 - b. Any size construction activity discharging stormwater to waters of the State that the Washington State Department of Ecology (Ecology):
 - i. Determines to be a significant contributor of pollutants to waters of the State of Washington.
 - ii. Reasonably expects to cause a violation of any water quality standard.
2. Operators of the following activities are not required to seek coverage under this CSWGP (unless specifically required under Special Condition S1.B.1.b, above):
 - a. Construction activities that discharge all stormwater and non-stormwater to groundwater, sanitary sewer, or combined sewer, and have no point source discharge to either surface water or a storm sewer system that drains to surface waters of the State.
 - b. Construction activities covered under an Erosivity Waiver (Special Condition S1.F).
 - c. Routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

C. Authorized Discharges

1. **Stormwater Associated with Construction Activity.** Subject to compliance with the terms and conditions of this permit, Permittees are authorized to discharge stormwater associated with construction activity to surface waters of the State or to a storm sewer system that drains to surface waters of the State. (Note that “surface waters of the

State” may exist on a construction site as well as off site; for example, a creek running through a site.)

2. **Stormwater Associated with Construction Support Activity.** This permit also authorizes stormwater discharge from support activities related to the permitted construction site (for example, an on-site portable rock crusher, off-site equipment staging yards, material storage areas, borrow areas, etc.) provided:
 - a. The support activity relates directly to the permitted construction site that is required to have an NPDES permit; and
 - b. The support activity is not a commercial operation serving multiple unrelated construction projects, and does not operate beyond the completion of the construction activity; and
 - c. Appropriate controls and measures are identified in the Stormwater Pollution Prevention Plan (SWPPP) for the discharges from the support activity areas.
3. **Non-Stormwater Discharges.** The categories and sources of non-stormwater discharges identified below are authorized conditionally, provided the discharge is consistent with the terms and conditions of this permit:
 - a. Discharges from fire-fighting activities.
 - b. Fire hydrant system flushing.
 - c. Potable water, including uncontaminated water line flushing.
 - d. Hydrostatic test water.
 - e. Uncontaminated air conditioning or compressor condensate.
 - f. Uncontaminated groundwater or spring water.
 - g. Uncontaminated excavation dewatering water (in accordance with S9.D.10).
 - h. Uncontaminated discharges from foundation or footing drains.
 - i. Uncontaminated or potable water used to control dust. Permittees must minimize the amount of dust control water used.
 - j. Routine external building wash down that does not use detergents.
 - k. Landscape irrigation water.

The SWPPP must adequately address all authorized non-stormwater discharges, except for discharges from fire-fighting activities, and must comply with Special Condition S3. At a minimum, discharges from potable water (including water line flushing), fire hydrant system flushing, and pipeline hydrostatic test water must undergo the following: dechlorination to a concentration of 0.1 parts per million (ppm) or less, and pH adjustment to within 6.5 – 8.5 standard units (su), if necessary.

D. Prohibited Discharges

The following discharges to waters of the State, including groundwater, are prohibited:

1. Concrete wastewater
2. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.
3. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2 (See Appendix A of this permit).
4. Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed according to Special Condition S9.D.9.j.
5. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
6. Soaps or solvents used in vehicle and equipment washing.
7. Wheel wash wastewater, unless managed according to Special Condition S9.D.9.
8. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to Special Condition S9.D.10.

E. Limits on Coverage

Ecology may require any discharger to apply for and obtain coverage under an individual permit or another more specific general permit. Such alternative coverage will be required when Ecology determines that this CSWGP does not provide adequate assurance that water quality will be protected, or there is a reasonable potential for the project to cause or contribute to a violation of water quality standards.

The following stormwater discharges are not covered by this permit:

1. Post-construction stormwater discharges that originate from the site after completion of construction activities and the site has undergone final stabilization.
2. Non-point source silvicultural activities such as nursery operations, site preparation, reforestation and subsequent cultural treatment, thinning, prescribed burning, pest and fire control, harvesting operations, surface drainage, or road construction and maintenance, from which there is natural runoff as excluded in 40 CFR Subpart 122.
3. Stormwater from any federal operator.
4. Stormwater from facilities located on **Indian Country** as defined in 18 U.S.C.§1151, except portions of the Puyallup Reservation as noted below.

Indian Country includes:

- a. All land within any Indian Reservation notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation. This includes all federal, tribal, and Indian and non-Indian privately owned land within the reservation.
- b. All off-reservation Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.
- c. All off-reservation federal trust lands held for Native American Tribes.

Puyallup Exception: Following the *Puyallup Tribes of Indians Land Settlement Act of 1989*, 25 U.S.C. §1773; the permit does apply to land within the Puyallup Reservation except for discharges to surface water on land held in trust by the federal government.

5. Stormwater from any site covered under an existing NPDES individual permit in which stormwater management and/or treatment requirements are included for all stormwater discharges associated with construction activity.
6. Stormwater from a site where an applicable Total Maximum Daily Load (TMDL) requirement specifically precludes or prohibits discharges from construction activity.

F. Erosivity Waiver

Construction site operators may qualify for an Erosivity Waiver from the CSWGP if the following conditions are met:

1. The site will result in the disturbance of fewer than five (5) acres and the site is not a portion of a common plan of development or sale that will disturb five (5) acres or greater.
2. Calculation of Erosivity “R” Factor and Regional Timeframe:
 - a. The project’s calculated rainfall erosivity factor (“R” Factor) must be less than five (5) during the period of construction activity, (See the CSWGP homepage <http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html> for a link to the EPA’s calculator and step by step instructions on computing the “R” Factor in the *EPA Erosivity Waiver Fact Sheet*). The period of construction activity starts when the land is first disturbed and ends with final stabilization. In addition:
 - b. The entire period of construction activity must fall within the following timeframes:
 - i. For sites west of the Cascades Crest: June 15 – September 15.
 - ii. For sites east of the Cascades Crest, excluding the Central Basin: June 15 – October 15.
 - iii. For sites east of the Cascades Crest, within the Central Basin: no timeframe restrictions apply. The Central Basin is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches. For a map of the Central Basin (Average Annual Precipitation Region 2), refer to: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/resourcesguidance.html>.
3. Construction site operators must submit a complete Erosivity Waiver certification form at least one week before disturbing the land. Certification must include statements that the operator will:
 - a. Comply with applicable local stormwater requirements; and
 - b. Implement appropriate erosion and sediment control BMPs to prevent violations of water quality standards.
4. This waiver is not available for facilities declared significant contributors of pollutants as defined in Special Condition S1.B.1.b or for any size construction activity that could

reasonably expect to cause a violation of any water quality standard as defined in Special Condition S1.B.1.b.ii.

5. This waiver does not apply to construction activities which include non-stormwater discharges listed in Special Condition S1.C.3.
6. If construction activity extends beyond the certified waiver period for any reason, the operator must either:
 - a. Recalculate the rainfall erosivity “R” factor using the original start date and a new projected ending date and, if the “R” factor is still under 5 *and* the entire project falls within the applicable regional timeframe in Special Condition S1.F.2.b, complete and submit an amended waiver certification form before the original waiver expires; *or*
 - b. Submit a complete permit application to Ecology in accordance with Special Condition S2.A and B before the end of the certified waiver period.

S2. APPLICATION REQUIREMENTS

A. Permit Application Forms

1. *Notice of Intent Form*

- a. Operators of new or previously unpermitted construction activities must submit a complete and accurate permit application (Notice of Intent, or NOI) to Ecology.
- b. Operators must apply using the electronic application form (NOI) available on Ecology’s website (<http://ecy.wa.gov/programs/wq/stormwater/construction/index.html>). Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

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- c. The operator must submit the NOI at least 60 days before discharging stormwater from construction activities and must submit it prior to the date of the first public notice (See Special Condition S2.B, below, for details). The 30-day public comment period begins on the publication date of the second public notice. Unless Ecology responds to the complete application in writing, coverage under the general permit will automatically commence on the 31st day following receipt by Ecology of a *completed* NOI, or the issuance date of this permit, whichever is later; unless Ecology specifies a later date in writing as required by WAC173-226-200(2). See S8.B for Limits on Coverage for New Discharges to TMDL or 303(d)-Listed Waters.
- d. If an applicant intends to use a Best Management Practice (BMP) selected on the basis of Special Condition S9.C.4 (“demonstrably equivalent” BMPs), the applicant must notify Ecology of its selection as part of the NOI. In the event the applicant selects BMPs after submission of the NOI, the applicant must provide notice of the

selection of an equivalent BMP to Ecology at least 60 days before intended use of the equivalent BMP.

- e. Applicants must notify Ecology if they are aware of contaminated soils and/or groundwater associated with the construction activity. Provide detailed information with the NOI (as known and readily available) on the nature and extent of the contamination (concentrations, locations, and depth), as well as pollution prevention and/or treatment BMPs proposed to control the discharge of soil and/or groundwater contaminants in stormwater. Examples of such detail may include, but are not limited to:
 - i. List or table of all known contaminants with laboratory test results showing concentration and depth,
 - ii. Map with sample locations,
 - iii. Related portions of the Stormwater Pollution Prevention Plan (SWPPP) that address the management of contaminated and potentially contaminated construction stormwater and dewatering water,
 - iv. Dewatering plan and/or dewatering contingency plan.

2. ***Transfer of Coverage Form***

The Permittee can transfer current coverage under this permit to one or more new operators, including operators of sites within a Common Plan of Development, provided:

- i. The Permittee submits a complete Transfer of Coverage Form to Ecology, signed by the current and new discharger and containing a specific date for transfer of permit responsibility, coverage and liability (including any Administrative Orders associated with the permit); and
- ii. Ecology does not notify the current discharger and new discharger of intent to revoke coverage under the general permit. If this notice is not given, the transfer is effective on the date specified in the written agreement.

When a current discharger (Permittee) transfers a portion of a permitted site, the current discharger must also indicate the remaining permitted acreage after the transfer. Transfers do not require public notice.

3. ***Modification of Coverage Form***

Permittees must notify Ecology regarding any changes to the information provided on the NOI by submitting an Update/Modification of Permit Coverage form in accordance with General Conditions G6 and G19. Examples of such changes include, but are not limited to:

- i. Changes to the Permittee's mailing address,
- ii. Changes to the on-site contact person information, and
- iii. Changes to the area/acreage affected by construction activity.

B. Public Notice

For new or previously unpermitted construction activities, the applicant must publish a public notice at least one time each week for two consecutive weeks, at least 7 days apart, in a newspaper with general circulation in the county where the construction is to take place. The notice must be run after the NOI has been submitted and must contain:

1. A statement that *“The applicant is seeking coverage under the Washington State Department of Ecology’s Construction Stormwater NPDES and State Waste Discharge General Permit.”*
2. The name, address, and location of the construction site.
3. The name and address of the applicant.
4. The type of construction activity that will result in a discharge (for example, residential construction, commercial construction, etc.), and the total number of acres to be disturbed over the lifetime of the project.
5. The name of the receiving water(s) (that is, the surface water(s) to which the site will discharge), or, if the discharge is through a storm sewer system, the name of the operator of the system and the receiving water(s) the system discharges to.
6. The statement: *Any persons desiring to present their views to the Washington State Department of Ecology regarding this application, or interested in Ecology’s action on this application, may notify Ecology in writing no later than 30 days of the last date of publication of this notice. Ecology reviews public comments and considers whether discharges from this project would cause a measurable change in receiving water quality, and, if so, whether the project is necessary and in the overriding public interest according to Tier II antidegradation requirements under WAC 173-201A-320. Comments can be submitted to: Department of Ecology, PO Box 47696, Olympia, Washington 98504-7696 Attn: Water Quality Program, Construction Stormwater.*

S3. COMPLIANCE WITH STANDARDS

- A. **Discharges must not** cause or contribute to a violation of surface water quality standards (Chapter 173-201A WAC), groundwater quality standards (Chapter 173-200 WAC), sediment management standards (Chapter 173-204 WAC), and human health-based criteria in the Federal water quality criteria applicable to Washington. (40 CFR Part 131.45) Discharges that are not in compliance with these standards are prohibited.
- B. **Prior to the discharge** of stormwater and non-stormwater to waters of the State, the Permittee must apply All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART). This includes the preparation and implementation of an adequate SWPPP, with all appropriate BMPs installed and maintained in accordance with the SWPPP and the terms and conditions of this permit.
- C. **Ecology presumes** that a Permittee complies with water quality standards unless discharge monitoring data or other site-specific information demonstrates that a discharge causes or contributes to a violation of water quality standards, when the Permittee complies with the following conditions. The Permittee must fully:

1. Comply with all permit conditions, including; planning, sampling, monitoring, reporting, and recordkeeping conditions.
 2. Implement stormwater BMPs contained in stormwater management manuals published or approved by Ecology, or BMPs that are demonstrably equivalent to BMPs contained in stormwater management manuals published or approved by Ecology, including the proper selection, implementation, and maintenance of all applicable and appropriate BMPs for on-site pollution control. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the *Phase I Municipal Stormwater Permit* are approved by Ecology.)
- D. Where construction sites** also discharge to groundwater, the groundwater discharges must also meet the terms and conditions of this CSWGP. Permittees who discharge to groundwater through an injection well must also comply with any applicable requirements of the Underground Injection Control (UIC) regulations, Chapter 173-218 WAC.

S4. MONITORING REQUIREMENTS, BENCHMARKS, AND REPORTING TRIGGERS

A. Site Log Book

The Permittee must maintain a site log book that contains a record of the implementation of the SWPPP and other permit requirements, including the installation and maintenance of BMPs, site inspections, and stormwater monitoring.

B. Site Inspections

Construction sites one (1) acre or larger that discharge stormwater to surface waters of the State must have site inspections conducted by a Certified Erosion and Sediment Control Lead (CESCL). Sites less than one (1) acre may have a person without CESCL certification conduct inspections. (See Special Conditions S4.B.3 and B.4, below, for detailed requirements of the Permittee's CESCL.)

Site inspections must include all areas disturbed by construction activities, all BMPs, and all stormwater discharge points under the Permittee's operational control.

1. The Permittee must have staff knowledgeable in the principles and practices of erosion and sediment control. The CESCL (sites one acre or more) or inspector (sites less than one acre) must have the skills to assess the:
 - a. Site conditions and construction activities that could impact the quality of stormwater; and
 - b. Effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. The SWPPP must identify the CESCL or inspector, who must be present on site or on-call at all times. The CESCL (sites one (1) acre or more) must obtain this certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology. (See BMP C160 in the manual, referred to in Special Condition S9.C.1 and 2.)
2. The CESCL or inspector must examine stormwater visually for the presence of suspended sediment, turbidity, discoloration, and oil sheen. BMP effectiveness must be evaluated to

determine if it is necessary to install, maintain, or repair BMPs to improve the quality of stormwater discharges.

Based on the results of the inspection, the Permittee must correct the problems identified, by:

- a. Reviewing the SWPPP for compliance with Special Condition S9 and making appropriate revisions within 7 days of the inspection.
 - b. Immediately beginning the process of fully implementing and maintaining appropriate source control and/or treatment BMPs, within 10 days of the inspection. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.
 - c. Documenting BMP implementation and maintenance in the site log book.
3. The CESCL or inspector must inspect all areas disturbed by construction activities, all BMPs, and all stormwater discharge points at least once every calendar week and within 24 hours of any discharge from the site. (For purposes of this condition, individual discharge events that last more than one (1) day do not require daily inspections. For example, if a stormwater pond discharges continuously over the course of a week, only one (1) inspection is required that week.) Inspection frequency may be reduced to once every calendar month for inactive sites that are temporarily stabilized.
4. The Permittee must summarize the results of each inspection in an inspection report or checklist and enter the report/checklist into, or attach it to, the site log book. At a minimum, each inspection report or checklist must include:
- a. Inspection date and time.
 - b. Weather information.
 - c. The general conditions during inspection.
 - d. The approximate amount of precipitation since the last inspection.
 - e. The approximate amount of precipitation within the last 24 hours.
 - f. A summary or list of all implemented BMPs, including observations of all erosion/sediment control structures or practices.
 - g. A description of:
 - i. BMPs inspected (including location).
 - ii. BMPs that need maintenance and why.
 - iii. BMPs that failed to operate as designed or intended, and
 - iv. Where additional or different BMPs are needed, and why.
 - h. A description of stormwater discharged from the site. The Permittee must note the presence of suspended sediment, turbidity, discoloration, and oil sheen, as applicable.

- i. Any water quality monitoring performed during inspection.
- j. General comments and notes, including a brief description of any BMP repairs, maintenance, or installations made following the inspection.
- k. An implementation schedule for the remedial actions that the Permittee plans to take if the site inspection indicates that the site is out of compliance. The remedial actions taken must meet the requirements of the SWPPP and the permit.
- l. A summary report of the inspection.
- m. The name, title, and signature of the person conducting the site inspection, a phone number or other reliable method to reach this person, and the following statement:
I certify that this report is true, accurate, and complete to the best of my knowledge and belief.

Table 3 Summary of Primary Monitoring Requirements

Size of Soil Disturbance ¹	Weekly Site Inspections	Weekly Sampling w/ Turbidity Meter	Weekly Sampling w/ Transparency Tube	Weekly pH Sampling ²	CESCL Required for Inspections?
Sites that disturb less than 1 acre, but are part of a larger Common Plan of Development	Required	Not Required	Not Required	Not Required	No
Sites that disturb 1 acre or more, but fewer than 5 acres	Required	Sampling Required – either method ³		Required	Yes
Sites that disturb 5 acres or more	Required	Required	Not Required ⁴	Required	Yes

¹ Soil disturbance is calculated by adding together all areas that will be affected by construction activity. Construction activity means clearing, grading, excavation, and any other activity that disturbs the surface of the land, including ingress/egress from the site.

² If construction activity results in the disturbance of 1 acre or more, and involves significant concrete work (1,000 cubic yards of concrete or recycled concrete placed or poured over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer stormwater collection system that drains to other surface waters of the State, the Permittee must conduct pH sampling in accordance with Special Condition S4.D.

³ Sites with one or more acres, but fewer than 5 acres of soil disturbance, must conduct turbidity or transparency sampling in accordance with Special Condition S4.C.4.a or b.

⁴ Sites equal to or greater than 5 acres of soil disturbance must conduct turbidity sampling using a turbidity meter in accordance with Special Condition S4.C.4.a.

C. Turbidity/Transparency Sampling Requirements

1. Sampling Methods

- a. If construction activity involves the disturbance of five (5) acres or more, the Permittee must conduct turbidity sampling per Special Condition S4.C.4.a, below.
- b. If construction activity involves one (1) acre or more but fewer than five (5) acres of soil disturbance, the Permittee must conduct either transparency sampling *or* turbidity sampling per Special Condition S4.C.4.a or b, below.

2. Sampling Frequency

- a. The Permittee must sample all discharge points at least once every calendar week when stormwater (or authorized non-stormwater) discharges from the site or enters any on-site surface waters of the state (for example, a creek running through a site); sampling is not required on sites that disturb less than an acre.
- b. Samples must be representative of the flow and characteristics of the discharge.
- c. Sampling is not required when there is no discharge during a calendar week.
- d. Sampling is not required outside of normal working hours or during unsafe conditions.
- e. If the Permittee is unable to sample during a monitoring period, the Permittee must include a brief explanation in the monthly Discharge Monitoring Report (DMR).
- f. Sampling is not required before construction activity begins.
- g. The Permittee may reduce the sampling frequency for temporarily stabilized, inactive sites to once every calendar month.

3. Sampling Locations

- a. Sampling is required at all points where stormwater associated with construction activity (or authorized non-stormwater) is discharged off site, including where it enters any on-site surface waters of the state (for example, a creek running through a site).
- b. The Permittee may discontinue sampling at discharge points that drain areas of the project that are fully stabilized to prevent erosion.
- c. The Permittee must identify all sampling point(s) in the SWPPP and on the site map and clearly mark these points in the field with a flag, tape, stake or other visible marker.
- d. Sampling is not required for discharge that is sent directly to sanitary or combined sewer systems.
- e. The Permittee may discontinue sampling at discharge points in areas of the project where the Permittee no longer has operational control of the construction activity.

4. Sampling and Analysis Methods

- a. The Permittee performs turbidity analysis with a calibrated turbidity meter (turbidimeter) either on site or at an accredited lab. The Permittee must record the results in the site log book in nephelometric turbidity units (NTUs).
- b. The Permittee performs transparency analysis on site with a 1¾ inch diameter, 60 centimeter (cm)-long transparency tube. The Permittee will record the results in the site log book in centimeters (cm).

Table 4 Monitoring and Reporting Requirements

Parameter	Unit	Analytical Method	Sampling Frequency	Benchmark Value
Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs
Transparency	Cm	Manufacturer instructions, or Ecology guidance	Weekly, if discharging	33 cm

5. Turbidity/Transparency Benchmark Values and Reporting Triggers

The benchmark value for turbidity is 25 NTUs. The benchmark value for transparency is 33 centimeters (cm). Note: Benchmark values do not apply to discharges to segments of water bodies on Washington State’s 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus; these discharges are subject to a numeric effluent limit for turbidity. Refer to Special Condition S8 for more information and follow S5.F – Noncompliance Notification for reporting requirements applicable to discharges which exceed the numeric effluent limit for turbidity.

- a. Turbidity 26 – 249 NTUs, or Transparency 32 – 7 cm:

If the discharge turbidity is 26 to 249 NTUs; or if discharge transparency is 32 to 7 cm, the Permittee must:

- i. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs, and no later than 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
- ii. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the date the discharge exceeded the benchmark.
- iii. Document BMP implementation and maintenance in the site log book.

- b. Turbidity 250 NTUs or greater, or Transparency 6 cm or less:

If a discharge point’s turbidity is 250 NTUs or greater, or if discharge transparency is less than or equal to 6 cm, the Permittee must complete the reporting and adaptive

management process described below. For discharges which are subject to a numeric effluent limit for turbidity, see S5.F – Noncompliance Notification.

- i. Within 24 hours, telephone or submit an electronic report to the applicable Ecology Region’s Environmental Report Tracking System (ERTS) number (or through Ecology’s Water Quality Permitting Portal [WQWebPortal] – Permit Submittals when the form is available), in accordance with Special Condition S5.A.
 - **Central Region** (Okanogan, Chelan, Douglas, Kittitas, Yakima, Klickitat, Benton): (509) 575-2490
 - **Eastern Region** (Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman): (509) 329-3400
 - **Northwest Region** (Kitsap, Snohomish, Island, King, San Juan, Skagit, Whatcom): (425) 649-7000
 - **Southwest Region** (Grays Harbor, Lewis, Mason, Thurston, Pierce, Clark, Cowlitz, Skamania, Wahkiakum, Clallam, Jefferson, Pacific): (360) 407-6300

These numbers and a link to the ERTS reporting page are also listed at the following website: <http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html>.

- ii. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems within 10 days of the date the discharge exceeded the benchmark. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when the Permittee requests an extension within the initial 10-day response period.
- iii. Sample discharges daily until:
 - a) Turbidity is 25 NTUs (or lower); or
 - b) Transparency is 33 cm (or greater); or
 - c) The Permittee has demonstrated compliance with the water quality standard for turbidity:
 - 1) No more than 5 NTUs over background turbidity, if background is less than 50 NTUs, or
 - 2) No more than 10% over background turbidity, if background is 50 NTUs or greater; or

*Note: background turbidity in the receiving water must be measured immediately upstream (upgradient) or outside of the area of influence of the discharge.
 - d) The discharge stops or is eliminated.
- iv. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within seven (7) days of the date the discharge exceeded the benchmark.

- v. Document BMP implementation and maintenance in the site log book.

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with permit benchmarks.

D. pH Sampling Requirements – Significant Concrete Work or Engineered Soils

If construction activity results in the disturbance of 1 acre or more, *and* involves significant concrete work (significant concrete work means greater than 1000 cubic yards placed or poured concrete or recycled concrete used over the life of a project) or the use of engineered soils (soil amendments including but not limited to Portland cement-treated base [CTB], cement kiln dust [CKD], or fly ash), and stormwater from the affected area drains to surface waters of the State or to a storm sewer system that drains to surface waters of the State, the Permittee must conduct pH sampling as set forth below. Note: In addition, discharges to segments of water bodies on Washington State's 303(d) list (Category 5) for high pH are subject to a numeric effluent limit for pH; refer to Special Condition S8.

1. The Permittee must perform pH analysis on site with a calibrated pH meter, pH test kit, or wide range pH indicator paper. The Permittee must record pH sampling results in the site log book.
2. During the applicable pH monitoring period defined below, the Permittee must obtain a representative sample of stormwater and conduct pH analysis at least once per week.
 - a. For sites with significant concrete work, the Permittee must begin the pH sampling period when the concrete is first placed or poured and exposed to precipitation, and continue weekly throughout and after the concrete placement, pour and curing period, until stormwater pH is in the range of 6.5 to 8.5 (su).
 - b. For sites with recycled concrete where monitoring is required, the Permittee must begin the weekly pH sampling period when the recycled concrete is first exposed to precipitation and must continue until the recycled concrete is fully stabilized with the stormwater pH in the range of 6.5 to 8.5 (su).
 - c. For sites with engineered soils, the Permittee must begin the pH sampling period when the soil amendments are first exposed to precipitation and must continue until the area of engineered soils is fully stabilized.
3. The Permittee must sample pH in the sediment trap/pond(s) or other locations that receive stormwater runoff from the area of significant concrete work or engineered soils before the stormwater discharges to surface waters.
4. The benchmark value for pH is 8.5 standard units. Anytime sampling indicates that pH is 8.5 or greater, the Permittee must either:
 - a. Prevent the high pH water (8.5 or above) from entering storm sewer systems or surface waters of the state; *or*
 - b. If necessary, adjust or neutralize the high pH water until it is in the range of pH 6.5 to 8.5 (su) using an appropriate treatment BMP such as carbon dioxide (CO₂) sparging, dry ice or food grade vinegar. The Permittee must obtain written approval from Ecology before using any form of chemical treatment other than CO₂ sparging, dry ice or food grade vinegar.

S5. REPORTING AND RECORDKEEPING REQUIREMENTS

A. High Turbidity Reporting

Anytime sampling performed in accordance with Special Condition S4.C indicates turbidity has reached the 250 NTUs or more (or transparency less than or equal to 6 cm), high turbidity reporting level, the Permittee must notify Ecology within 24 hours of analysis either by calling the applicable Ecology Region's Environmental Report Tracking System (ERTS) number by phone or by submitting an electronic ERTS report (through Ecology's Water Quality Permitting Portal (WQWebPortal) – Permit Submittals when the form is available). See the CSWGP website for links to ERTS and the WQWebPortal. (<http://www.ecy.wa.gov/programs/wq/stormwater/construction/index.html>) Also, see phone numbers in Special Condition S4.C.5.b.i.

B. Discharge Monitoring Reports (DMRs)

Permittees required to conduct water quality sampling in accordance with Special Conditions S4.C (Turbidity/Transparency), S4.D (pH), S8 (303[d]/TMDL sampling), and/or G12 (Additional Sampling) must submit the results to Ecology.

Permittees must submit monitoring data using Ecology's WQWebDMR web application accessed through Ecology's Water Quality Permitting Portal.

Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper copy DMR at:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

Permittees who obtain a waiver not to use WQWebDMR must use the forms provided to them by Ecology; submittals must be mailed to the address above. Permittees must submit DMR forms to be received by Ecology within 15 days following the end of each month.

If there was no discharge during a given monitoring period, all Permittees must submit a DMR as required with "no discharge" entered in place of the monitoring results. DMRs are required for the full duration of permit coverage (from the first full month following the effective date of permit coverage up until Ecology has approved termination of the coverage). For more information, contact Ecology staff using information provided at the following website: www.ecy.wa.gov/programs/wq/permits/paris/contacts.html.

C. Records Retention

The Permittee must retain records of all monitoring information (site log book, sampling results, inspection reports/checklists, etc.), Stormwater Pollution Prevention Plan, copy of the permit coverage letter (including Transfer of Coverage documentation) and any other documentation of compliance with permit requirements for the entire life of the construction project and for a minimum of five (5) years following the termination of permit coverage. Such information must include all calibration and maintenance records, and records of all data used to complete the application for this permit. This period of retention must be extended during

the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

D. Recording Results

For each measurement or sample taken, the Permittee must record the following information:

1. Date, place, method, and time of sampling or measurement.
2. The first and last name of the individual who performed the sampling or measurement.
3. The date(s) the analyses were performed.
4. The first and last name of the individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

E. Additional Monitoring by the Permittee

If the Permittee samples or monitors any pollutant more frequently than required by this permit using test procedures specified by Special Condition S4 of this permit, the sampling results for this monitoring must be included in the calculation and reporting of the data submitted in the Permittee's DMR.

F. Noncompliance Notification

In the event the Permittee is unable to comply with any part of the terms and conditions of this permit, and the resulting noncompliance may cause a threat to human health or the environment (such as but not limited to spills or fuels or other materials, catastrophic pond or slope failure, and discharges that violate water quality standards), or exceed numeric effluent limitations (see S8 – Discharges to 303(d) or TMDL Waterbodies), the Permittee must, upon becoming aware of the circumstance:

1. Notify Ecology within 24 hours of the failure to comply by calling the applicable Regional office ERTS phone number (refer to Special Condition S4.C.5.b.i, or go to <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue> to find contact information for the regional offices.)
2. Immediately take action to prevent the discharge/pollution, or otherwise stop or correct the noncompliance, and, if applicable, repeat sampling and analysis of any noncompliance immediately and submit the results to Ecology within five (5) days of becoming aware of the violation (See S5.F.3, below, for details on submitting results in a report).
3. Submit a detailed written report to Ecology within five (5) days of the time the Permittee becomes aware of the circumstances, unless requested earlier by Ecology. The report must be submitted using Ecology's Water Quality Permitting Portal (WQWebPortal) – Permit Submittals, unless a waiver from electronic reporting has been granted according to S5.B. The report must contain a description of the noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The Permittee must report any unanticipated bypass and/or upset that exceeds any effluent limit in the permit in accordance with the 24-hour reporting requirement contained in 40 C.F.R. 122.41(l)(6).

Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply. Upon request of the Permittee, Ecology may waive the requirement for a written report on a case-by-case basis, if the immediate notification is received by Ecology within 24 hours.

G. Access to Plans and Records

1. The Permittee must retain the following permit documentation (plans and records) on site, or within reasonable access to the site, for use by the operator or for on-site review by Ecology or the local jurisdiction:
 - a. General Permit
 - b. Permit Coverage Letter
 - c. Stormwater Pollution Prevention Plan (SWPPP)
 - d. Site Log Book
 - e. Erosivity Waiver (if applicable)
2. The Permittee must address written requests for plans and records listed above (Special Condition S5.G.1) as follows:
 - a. The Permittee must provide a copy of plans and records to Ecology within 14 days of receipt of a written request from Ecology.
 - b. The Permittee must provide a copy of plans and records to the public when requested in writing. Upon receiving a written request from the public for the Permittee's plans and records, the Permittee must either:
 - i. Provide a copy of the plans and records to the requester within 14 days of a receipt of the written request; *or*
 - ii. Notify the requester within 10 days of receipt of the written request of the location and times within normal business hours when the plans and records may be viewed; and provide access to the plans and records within 14 days of receipt of the written request; *or*

Within 14 days of receipt of the written request, the Permittee may submit a copy of the plans and records to Ecology for viewing and/or copying by the requester at an Ecology office, or a mutually agreed location. If plans and records are viewed and/or copied at a location other than at an Ecology office, the Permittee will provide reasonable access to copying services for which a reasonable fee may be charged. The Permittee must notify the requester within 10 days of receipt of the request where the plans and records may be viewed and/or copied.

S6. PERMIT FEES

The Permittee must pay permit fees assessed by Ecology. Fees for stormwater discharges covered under this permit are established by Chapter 173-224 WAC. Ecology continues to assess permit fees until the permit is terminated in accordance with Special Condition S10 or revoked in accordance with General Condition G5.

S7. SOLID AND LIQUID WASTE DISPOSAL

The Permittee must handle and dispose of solid and liquid wastes generated by construction activity, such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from cleaning catch basins and other stormwater facilities, in accordance with:

- A. Special Condition S3, Compliance with Standards.
- B. WAC 173-216-110.
- C. Other applicable regulations.

S8. DISCHARGES TO 303(d) OR TMDL WATERBODIES

A. Sampling and Numeric Effluent Limits For Certain Discharges to 303(d)-Listed Water Bodies

1. Permittees who discharge to segments of water bodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, high pH, or phosphorus, must conduct water quality sampling according to the requirements of this section, and Special Conditions S4.C.2.b-f and S4.C.3.b-d, and must comply with the applicable numeric effluent limitations in S8.C and S8.D.
2. All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current listing by Ecology of impaired waters (Category 5) that exists on January 1, 2021, or the date when the operator's complete permit application is received by Ecology, whichever is later.

B. Limits on Coverage for New Discharges to TMDL or 303(d)-Listed Waters

Construction sites that discharge to a TMDL or 303(d)-listed waterbody are not eligible for coverage under this permit *unless* the operator:

1. Prevents exposing stormwater to pollutants for which the waterbody is impaired, and retains documentation in the SWPPP that details procedures taken to prevent exposure on site; *or*
2. Documents that the pollutants for which the waterbody is impaired are not present at the site, and retains documentation of this finding within the SWPPP; *or*
3. Provides Ecology with data indicating the discharge is not expected to cause or contribute to an exceedance of a water quality standard, and retains such data on site with the SWPPP. The operator must provide data and other technical information to Ecology that sufficiently demonstrate:
 - a. For discharges to waters without an EPA-approved or -established TMDL, that the discharge of the pollutant for which the water is impaired will meet in-stream water quality criteria at the point of discharge to the waterbody; *or*
 - b. For discharges to waters with an EPA-approved or -established TMDL, that there is sufficient remaining wasteload allocation in the TMDL to allow construction stormwater discharge and that existing dischargers to the waterbody are subject to compliance schedules designed to bring the waterbody into attainment with water quality standards.

Operators of construction sites are eligible for coverage under this permit only after Ecology makes an affirmative determination that the *discharge will not cause or contribute to the existing impairment or exceed the TMDL.*

C. Sampling and Numeric Effluent Limits for Discharges to Water Bodies on the 303(d) List for Turbidity, Fine Sediment, or Phosphorus

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for turbidity, fine sediment, or phosphorus must conduct turbidity sampling in accordance with Special Condition S4.C.2 and comply with either of the numeric effluent limits noted in Table 5 below.
2. As an alternative to the 25 NTUs effluent limit noted in Table 5 below (applied at the point where stormwater [or authorized non-stormwater] is discharged off-site), Permittees may choose to comply with the surface water quality standard for turbidity. The standard is: no more than 5 NTUs over background turbidity when the background turbidity is 50 NTUs or less, or no more than a 10% increase in turbidity when the background turbidity is more than 50 NTUs. In order to use the water quality standard requirement, the sampling must take place at the following locations:
 - a. Background turbidity in the 303(d)-listed receiving water immediately upstream (upgradient) or outside the area of influence of the discharge.
 - b. Turbidity at the point of discharge into the 303(d)-listed receiving water, inside the area of influence of the discharge.
3. Discharges that exceed the numeric effluent limit for turbidity constitute a violation of this permit.
4. Permittees whose discharges exceed the numeric effluent limit must sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

Table 5 Turbidity, Fine Sediment & Phosphorus Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Sampling Frequency	Numeric Effluent Limit ¹
<ul style="list-style-type: none"> • Turbidity • Fine Sediment • Phosphorus 	Turbidity	NTU	SM2130	Weekly, if discharging	25 NTUs, at the point where stormwater is discharged from the site; <i>OR</i> In compliance with the surface water quality standard for turbidity (S8.C.2.a)

¹ Permittees subject to a numeric effluent limit for turbidity may, at their discretion, choose either numeric effluent limitation based on site-specific considerations including, but not limited to, safety, access and convenience.

D. Discharges to Water Bodies on the 303(d) List for High pH

1. Permittees who discharge to segments of water bodies on the 303(d) list (Category 5) for high pH must conduct pH sampling in accordance with the table below, and comply with the numeric effluent limit of pH 6.5 to 8.5 su (Table 6).

Table 6 pH Sampling and Limits for 303(d)-Listed Waters

Parameter identified in 303(d) listing	Parameter Sampled/Units	Analytical Method	Sampling Frequency	Numeric Effluent Limit
High pH	pH /Standard Units	pH meter	Weekly, if discharging	In the range of 6.5 – 8.5 su

2. At the Permittee’s discretion, compliance with the limit shall be assessed at one of the following locations:
 - a. Directly in the 303(d)-listed waterbody segment, inside the immediate area of influence of the discharge; *or*
 - b. Alternatively, the Permittee may measure pH at the point where the discharge leaves the construction site, rather than in the receiving water.
3. Discharges that exceed the numeric effluent limit for pH (outside the range of 6.5 – 8.5 su) constitute a violation of this permit.
4. Permittees whose discharges exceed the numeric effluent limit must sample discharges daily until the violation is corrected and comply with the non-compliance notification requirements in Special Condition S5.F.

E. Sampling and Limits for Sites Discharging to Waters Covered by a TMDL or another Pollution Control Plan

1. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL. Refer to <http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/TMDLbyWria.html> for more information on TMDLs.
 - a. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges must be consistent with any specific waste load allocations or requirements established by the applicable TMDL.
 - i. The Permittee must sample discharges weekly, unless otherwise specified by the TMDL, to evaluate compliance with the specific waste load allocations or requirements.
 - ii. Analytical methods used to meet the monitoring requirements must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136.
 - iii. Turbidity and pH methods need not be accredited or registered unless conducted at a laboratory which must otherwise be accredited or registered.
 - b. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but has not identified specific requirements, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.
 - c. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with Special Conditions S4 (Monitoring) and S9 (SWPPPs) will constitute compliance with the approved TMDL.
 - d. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

S9. STORMWATER POLLUTION PREVENTION PLAN

The Permittee must prepare and properly implement an adequate Stormwater Pollution Prevention Plan (SWPPP) for construction activity in accordance with the requirements of this permit beginning with initial soil disturbance and until final stabilization.

A. The Permittee's SWPPP must meet the following objectives:

1. To identify best management practices (BMPs) which prevent erosion and sedimentation, and to reduce, eliminate or prevent stormwater contamination and water pollution from construction activity.
2. To prevent violations of surface water quality, groundwater quality, or sediment management standards.
3. To control peak volumetric flow rates and velocities of stormwater discharges.

B. General Requirements

1. The SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution prevention decisions made for the project. Documentation must include:
 - a. Information about existing site conditions (topography, drainage, soils, vegetation, etc.).
 - b. Potential erosion problem areas.
 - c. The 13 elements of a SWPPP in Special Condition S9.D.1-13, including BMPs used to address each element.
 - d. Construction phasing/sequence and general BMP implementation schedule.
 - e. The actions to be taken if BMP performance goals are not achieved—for example, a contingency plan for additional treatment and/or storage of stormwater that would violate the water quality standards if discharged.
 - f. Engineering calculations for ponds, treatment systems, and any other designed structures. When a treatment system requires engineering calculations, these calculations must be included in the SWPPP. Engineering calculations do not need to be included in the SWPPP for treatment systems that do not require such calculations.
2. The Permittee must modify the SWPPP if, during inspections or investigations conducted by the owner/operator, or the applicable local or state regulatory authority, it is determined that the SWPPP is, or would be, ineffective in eliminating or significantly minimizing pollutants in stormwater discharges from the site. The Permittee must then:
 - a. Review the SWPPP for compliance with Special Condition S9 and make appropriate revisions within 7 days of the inspection or investigation.
 - b. Immediately begin the process to fully implement and maintain appropriate source control and/or treatment BMPs as soon as possible, addressing the problems no later than 10 days from the inspection or investigation. If installation of necessary treatment BMPs is not feasible within 10 days, Ecology may approve additional time when an extension is requested by a Permittee within the initial 10-day response period.
 - c. Document BMP implementation and maintenance in the site log book.

The Permittee must modify the SWPPP whenever 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.

C. Stormwater Best Management Practices (BMPs)

BMPs must be consistent with:

1. *Stormwater Management Manual for Western Washington* (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; or

2. *Stormwater Management Manual for Eastern Washington* (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; *or*
3. Revisions to the manuals listed in Special Condition S9.C.1 & 2, or other stormwater management guidance documents or manuals which provide an equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230; *or*
4. Documentation in the SWPPP that the BMPs selected provide an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including:
 - a. The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.
 - b. An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

D. SWPPP – Narrative Contents and Requirements

The Permittee must include each of the 13 elements below in Special Condition S9.D.1-13 in the narrative of the SWPPP and implement them unless site conditions render the element unnecessary and the exemption from that element is clearly justified in the SWPPP.

1. Preserve Vegetation/Mark Clearing Limits
 - a. Before beginning land-disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
 - b. Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum degree practicable.
2. Establish Construction Access
 - a. Limit construction vehicle access and exit to one route, if possible.
 - b. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking sediment onto roads.
 - c. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
 - d. If sediment is tracked off site, clean the affected roadway thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or pickup and transport of the sediment to a controlled sediment disposal area.
 - e. Conduct street washing only after sediment removal in accordance with Special Condition S9.D.2.d.
 - f. Control street wash wastewater by pumping back on site or otherwise preventing it from discharging into systems tributary to waters of the State.

3. Control Flow Rates

- a. Protect properties and waterways downstream of construction sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site, as required by local plan approval authority.
- b. Where necessary to comply with Special Condition S9.D.3.a, construct stormwater infiltration or detention BMPs as one of the first steps in grading. Assure that detention BMPs function properly before constructing site improvements (for example, impervious surfaces).
- c. If permanent infiltration ponds are used for flow control during construction, protect these facilities from sedimentation during the construction phase.

4. Install Sediment Controls

The Permittee must design, install and maintain effective erosion controls and sediment controls to minimize the discharge of pollutants. At a minimum, the Permittee must:

- a. Construct sediment control BMPs (sediment ponds, traps, filters, infiltration facilities, etc.) as one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.
- b. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
- c. Direct stormwater runoff from disturbed areas through a sediment pond or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must meet the flow control performance standard of Special Condition S9.D.3.a.
- d. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
- e. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.
- f. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

5. Stabilize Soils

- a. The Permittee must stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion

control fabrics and matting, soil application of polyacrylamide (PAM), the early application of gravel base on areas to be paved, and dust control.

- b. The Permittee must control stormwater volume and velocity within the site to minimize soil erosion.
- c. The Permittee must control stormwater discharges, including both peak flow rates and total stormwater volume, to minimize erosion at outlets and to minimize downstream channel and stream bank erosion.
- d. Depending on the geographic location of the project, the Permittee must not allow soils to remain exposed and unworked for more than the time periods set forth below to prevent erosion.

West of the Cascade Mountains Crest

During the dry season (May 1 - September 30): 7 days

During the wet season (October 1 - April 30): 2 days

East of the Cascade Mountains Crest, except for Central Basin*

During the dry season (July 1 - September 30): 10 days

During the wet season (October 1 - June 30): 5 days

The Central Basin*, East of the Cascade Mountains Crest

During the dry Season (July 1 - September 30): 30 days

During the wet season (October 1 - June 30): 15 days

***Note: The Central Basin** is defined as the portions of Eastern Washington with mean annual precipitation of less than 12 inches.

- e. The Permittee must stabilize soils at the end of the shift before a holiday or weekend if needed based on the weather forecast.
- f. The Permittee must stabilize soil stockpiles from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways, and drainage channels.
- g. The Permittee must minimize the amount of soil exposed during construction activity.
- h. The Permittee must minimize the disturbance of steep slopes.
- i. The Permittee must minimize soil compaction and, unless infeasible, preserve topsoil.

6. Protect Slopes

- a. The Permittee must design and construct cut-and-fill slopes in a manner to minimize erosion. Applicable practices include, but are not limited to, reducing continuous length of slope with terracing and diversions, reducing slope steepness, and roughening slope surfaces (for example, track walking).
- b. The Permittee must divert off-site stormwater (run-on) or groundwater away from slopes and disturbed areas with interceptor dikes, pipes, and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.
- c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion.

- i. West of the Cascade Mountains Crest: Temporary pipe slope drains must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model (WVHM) to predict flows, bare soil areas should be modeled as "landscaped area."
 - ii. East of the Cascade Mountains Crest: Temporary pipe slope drains must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.
 - d. Place excavated material on the uphill side of trenches, consistent with safety and space considerations.
 - e. Place check dams at regular intervals within constructed channels that are cut down a slope.
7. Protect Drain Inlets
- a. Protect all storm drain inlets made operable during construction so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.
 - b. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).
8. Stabilize Channels and Outlets
- a. Design, construct and stabilize all on-site conveyance channels to prevent erosion from the following expected peak flows:
 - i. West of the Cascade Mountains Crest: Channels must handle the peak 10-minute flow rate from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate indicated by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis must use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis must use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the WVHM to predict flows, bare soil areas should be modeled as "landscaped area."
 - ii. East of the Cascade Mountains Crest: Channels must handle the expected peak flow rate from a 6-month, 3-hour storm for the developed condition, referred to as the short duration storm.
 - b. Provide stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches at the outlets of all conveyance systems.

9. Control Pollutants

Design, install, implement and maintain effective pollution prevention measures to minimize the discharge of pollutants. The Permittee must:

- a. Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.
- b. Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. Minimize storage of hazardous materials on-site. Safety Data Sheets (SDS) should be supplied for all materials stored. Chemicals should be kept in their original labeled containers. On-site fueling tanks must include secondary containment. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume of the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.
- c. Conduct maintenance, fueling, and repair of heavy equipment and vehicles using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.
- d. Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as closed-loop recirculation or upland land application, or to the sanitary sewer with local sewer district approval.
- e. Apply fertilizers and pesticides in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' label requirements for application rates and procedures.
- f. Use BMPs to prevent contamination of stormwater runoff by pH-modifying sources. The sources for this contamination include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, recycled concrete stockpiles, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. (Also refer to the definition for "concrete wastewater" in Appendix A – Definitions.)
- g. Adjust the pH of stormwater or authorized non-stormwater if necessary to prevent an exceedance of groundwater and/or surface water quality standards.
- h. Assure that washout of concrete trucks is performed off-site or in designated concrete washout areas only. Do not wash out concrete truck drums onto the ground, or into storm drains, open ditches, streets, or streams. Washout of small concrete handling equipment may be disposed of in a formed area awaiting concrete where it will not contaminate surface or groundwater. Do not dump excess concrete on site, except in designated concrete washout areas. Concrete spillage or concrete discharge directly to groundwater or surface waters of the State is

prohibited. At no time shall concrete be washed off into the footprint of an area where an infiltration BMP will be installed.

- i. Obtain written approval from Ecology before using any chemical treatment, with the exception of CO₂, dry ice or food grade vinegar, to adjust pH.
- j. Uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations may be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters. Prior to infiltration, water from water-only based shaft drilling that comes into contact with curing concrete must be neutralized until pH is in the range of 6.5 to 8.5 (su).

10. Control Dewatering

- a. Permittees must discharge foundation, vault, and trench dewatering water, which have characteristics similar to stormwater runoff at the site, in conjunction with BMPs to reduce sedimentation before discharge to a sediment trap or sediment pond.
- b. Permittees may discharge clean, non-turbid dewatering water, such as well-point groundwater, to systems tributary to, or directly into surface waters of the State, as specified in Special Condition S9.D.8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route clean dewatering water through stormwater sediment ponds. Note that "surface waters of the State" may exist on a construction site as well as off site; for example, a creek running through a site.
- c. Other dewatering treatment or disposal options may include:
 - i. Infiltration
 - ii. Transport off site in a vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters.
 - iii. Ecology-approved on-site chemical treatment or other suitable treatment technologies (See S9.D.9.i, regarding chemical treatment written approval).
 - iv. Sanitary or combined sewer discharge with local sewer district approval, if there is no other option.
 - v. Use of a sedimentation bag with discharge to a ditch or swale for small volumes of localized dewatering.
- d. Permittees must handle highly turbid or contaminated dewatering water separately from stormwater.

11. Maintain BMPs

- a. Permittees must maintain and repair all temporary and permanent erosion and sediment control BMPs as needed to assure continued performance of their intended function in accordance with BMP specifications.
- b. Permittees must remove all temporary erosion and sediment control BMPs within 30 days after achieving final site stabilization or after the temporary BMPs are no longer needed.

12. Manage the Project

- a. Phase development projects to the maximum degree practicable and take into account seasonal work limitations.
- b. Inspect, maintain and repair all BMPs as needed to assure continued performance of their intended function. Conduct site inspections and monitoring in accordance with Special Condition S4.
- c. Maintain, update, and implement the SWPPP in accordance with Special Conditions S3, S4, and S9.

13. Protect Low Impact Development (LID) BMPs

The primary purpose of on-site LID Stormwater Management is to reduce the disruption of the natural site hydrology through infiltration. LID BMPs are permanent facilities.

- a. Permittees must protect all LID BMPs (including, but not limited to, Bioretention and Rain Garden facilities) from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the Bioretention and/or Rain Garden facilities. Restore the BMPs to their fully functioning condition if they accumulate sediment during construction. Restoring the facility must include removal of sediment and any sediment-laden bioretention/ rain garden soils, and replacing the removed soils with soils meeting the design specification.
- b. Permittees must maintain the infiltration capabilities of LID BMPs by protecting against compaction by construction equipment and foot traffic. Protect completed lawn and landscaped areas from compaction due to construction equipment.
- c. Permittees must control erosion and avoid introducing sediment from surrounding land uses onto permeable pavements. Do not allow muddy construction equipment on the base material or pavement. Do not allow sediment-laden runoff onto permeable pavements or base materials.
- d. Permittees must clean permeable pavements fouled with sediments or no longer passing an initial infiltration test using local stormwater manual methodology or the manufacturer's procedures.
- e. Permittees must keep all heavy equipment off existing soils under LID BMPs that have been excavated to final grade to retain the infiltration rate of the soils.

E. SWPPP – Map Contents and Requirements

The Permittee's SWPPP must also include a vicinity map or general location map (for example, a USGS quadrangle map, a portion of a county or city map, or other appropriate map) with enough detail to identify the location of the construction site and receiving waters within one mile of the site.

The SWPPP must also include a legible site map (or maps) showing the entire construction site. The following features must be identified, unless not applicable due to site conditions.

1. The direction of north, property lines, and existing structures and roads.
2. Cut and fill slopes indicating the top and bottom of slope catch lines.

3. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
4. Areas of soil disturbance and areas that will not be disturbed.
5. Locations of structural and nonstructural controls (BMPs) identified in the SWPPP.
6. Locations of off-site material, stockpiles, waste storage, borrow areas, and vehicle/equipment storage areas.
7. Locations of all surface water bodies, including wetlands.
8. Locations where stormwater or non-stormwater discharges off-site and/or to a surface waterbody, including wetlands.
9. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.
10. Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply.
11. Location or proposed location of LID facilities.

S10. NOTICE OF TERMINATION

Partial terminations of permit coverage are not authorized.

- A.** The site is eligible for termination of coverage when it has met any of the following conditions:
 1. The site has undergone final stabilization, the Permittee has removed all temporary BMPs (except biodegradable BMPs clearly manufactured with the intention for the material to be left in place and not interfere with maintenance or land use), and all stormwater discharges associated with construction activity have been eliminated; *or*
 2. All portions of the site that have not undergone final stabilization per Special Condition S10.A.1 have been sold and/or transferred (per Special Condition S2.A), and the Permittee no longer has operational control of the construction activity; *or*
 3. For residential construction only, the Permittee has completed temporary stabilization and the homeowners have taken possession of the residences.
- B.** When the site is eligible for termination, the Permittee must submit a complete and accurate Notice of Termination (NOT) form, signed in accordance with General Condition G2, to:

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

When an electronic termination form is available, the Permittee may choose to submit a complete and accurate Notice of Termination (NOT) form through the Water Quality Permitting Portal rather than mailing a hardcopy as noted above.

The termination is effective on the 31st calendar day following the date Ecology receives a complete NOT form, unless Ecology notifies the Permittee that termination request is denied because the Permittee has not met the eligibility requirements in Special Condition S10.A.

Permittees are required to comply with all conditions and effluent limitations in the permit until the permit has been terminated.

Permittees transferring the property to a new property owner or operator/Permittee are required to complete and submit the Notice of Transfer form to Ecology, but are not required to submit a Notice of Termination form for this type of transaction.

GENERAL CONDITIONS

G1. DISCHARGE VIOLATIONS

All discharges and activities authorized by this general permit must be consistent with the terms and conditions of this general permit. Any discharge of any pollutant more frequent than or at a level in excess of that identified and authorized by the general permit must constitute a violation of the terms and conditions of this permit.

G2. SIGNATORY REQUIREMENTS

- A.** All permit applications must bear a certification of correctness to be signed:
1. In the case of corporations, by a responsible corporate officer.
 2. In the case of a partnership, by a general partner of a partnership.
 3. In the case of sole proprietorship, by the proprietor.
 4. In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.
- B.** All reports required by this permit and other information requested by Ecology (including NOIs, NOTs, and Transfer of Coverage forms) must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
1. The authorization is made in writing by a person described above and submitted to Ecology.
 2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters.
- C.** Changes to authorization. If an authorization under paragraph G2.B.2 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph G2.B.2 above must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.
- D.** Certification. Any person signing a document under this section must make the following certification:

I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

G3. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

- A.** To enter upon the premises where a discharge is located or where any records are kept under the terms and conditions of this permit.
- B.** To have access to and copy, at reasonable times and at reasonable cost, any records required to be kept under the terms and conditions of this permit.
- C.** To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
- D.** To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G4. GENERAL PERMIT MODIFICATION AND REVOCATION

This permit may be modified, revoked and reissued, or terminated in accordance with the provisions of Chapter 173-226 WAC. Grounds for modification, revocation and reissuance, or termination include, but are not limited to, the following:

- A.** When a change occurs in the technology or practices for control or abatement of pollutants applicable to the category of dischargers covered under this permit.
- B.** When effluent limitation guidelines or standards are promulgated pursuant to the CWA or Chapter 90.48 RCW, for the category of dischargers covered under this permit.
- C.** When a water quality management plan containing requirements applicable to the category of dischargers covered under this permit is approved, or
- D.** When information is obtained that indicates cumulative effects on the environment from dischargers covered under this permit are unacceptable.

G5. REVOCATION OF COVERAGE UNDER THE PERMIT

Pursuant to Chapter 43.21B RCW and Chapter 173-226 WAC, the Director may terminate coverage for any discharger under this permit for cause. Cases where coverage may be terminated include, but are not limited to, the following:

- A.** Violation of any term or condition of this permit.
- B.** Obtaining coverage under this permit by misrepresentation or failure to disclose fully all relevant facts.
- C.** A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.
- D.** Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.
- E.** A determination that the permitted activity endangers human health or the environment, or contributes to water quality standards violations.
- F.** Nonpayment of permit fees or penalties assessed pursuant to RCW 90.48.465 and Chapter 173-224 WAC.

- G.** Failure of the Permittee to satisfy the public notice requirements of WAC 173-226-130(5), when applicable.

The Director may require any discharger under this permit to apply for and obtain coverage under an individual permit or another more specific general permit. Permittees who have their coverage revoked for cause according to WAC 173-226-240 may request temporary coverage under this permit during the time an individual permit is being developed, provided the request is made within ninety (90) days from the time of revocation and is submitted along with a complete individual permit application form.

G6. REPORTING A CAUSE FOR MODIFICATION

The Permittee must submit a new application, or a supplement to the previous application, whenever a material change to the construction activity or in the quantity or type of discharge is anticipated which is not specifically authorized by this permit. This application must be submitted at least sixty (60) days prior to any proposed changes. Filing a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not relieve the Permittee of the duty to comply with the existing permit until it is modified or reissued.

G7. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit will be construed as excusing the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G8. DUTY TO REAPPLY

The Permittee must apply for permit renewal at least 180 days prior to the specified expiration date of this permit. The Permittee must reapply using the electronic application form (NOI) available on Ecology's website. Permittees unable to submit electronically (for example, those who do not have an internet connection) must contact Ecology to request a waiver and obtain instructions on how to obtain a paper NOI.

Department of Ecology
Water Quality Program - Construction Stormwater
PO Box 47696
Olympia, WA 98504-7696

G9. REMOVED SUBSTANCE

The Permittee must not re-suspend or reintroduce collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of stormwater to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology, within a reasonable time, all information that Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit [40 CFR 122.41(h)].

G11. OTHER REQUIREMENTS OF 40 CFR

All other requirements of 40 CFR 122.41 and 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by administrative order or permit modification.

G13. PENALTIES FOR VIOLATING PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit shall be deemed guilty of a crime, and upon conviction thereof shall be punished by a fine of up to ten thousand dollars (\$10,000) and costs of prosecution, or by imprisonment at the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit shall incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars (\$10,000) for every such violation. Each and every such violation shall be a separate and distinct offense, and in case of a continuing violation, every day's continuance shall be deemed to be a separate and distinct violation.

G14. UPSET

Definition – "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that: 1) an upset occurred and that the Permittee can identify the cause(s) of the upset; 2) the permitted facility was being properly operated at the time of the upset; 3) the Permittee submitted notice of the upset as required in Special Condition S5.F, and; 4) the Permittee complied with any remedial measures required under this permit.

In any enforcement proceeding, the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G15. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G16. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

G17. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G18. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition, punishment shall be a fine of not more than \$20,000 per day of violation, or imprisonment of not more than four (4) years, or both.

G19. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, give notice to Ecology of planned physical alterations, modifications or additions to the permitted construction activity. The Permittee should be aware that, depending on the nature and size of the changes to the original permit, a new public notice and other permit process requirements may be required. Changes in activities that require reporting to Ecology include those that will result in:

- A.** The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).
- B.** A significant change in the nature or an increase in quantity of pollutants discharged, including but not limited to: a 20% or greater increase in acreage disturbed by construction activity.
- C.** A change in or addition of surface water(s) receiving stormwater or non-stormwater from the construction activity.
- D.** A change in the construction plans and/or activity that affects the Permittee's monitoring requirements in Special Condition S4.

Following such notice, permit coverage may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G20. REPORTING OTHER INFORMATION

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to Ecology, it must promptly submit such facts or information.

G21. REPORTING ANTICIPATED NON-COMPLIANCE

The Permittee must give advance notice to Ecology by submission of a new application or supplement thereto at least forty-five (45) days prior to commencement of such discharges, of any facility expansions, production increases, or other planned changes, such as process modifications, in the permitted facility or activity which may result in noncompliance with permit limits or conditions. Any maintenance of facilities, which might necessitate unavoidable interruption of

operation and degradation of effluent quality, must be scheduled during non-critical water quality periods and carried out in a manner approved by Ecology.

G22. REQUESTS TO BE EXCLUDED FROM COVERAGE UNDER THE PERMIT

Any discharger authorized by this permit may request to be excluded from coverage under the general permit by applying for an individual permit. The discharger must submit to the Director an application as described in WAC 173-220-040 or WAC 173-216-070, whichever is applicable, with reasons supporting the request. These reasons will fully document how an individual permit will apply to the applicant in a way that the general permit cannot. Ecology may make specific requests for information to support the request. The Director will either issue an individual permit or deny the request with a statement explaining the reason for the denial. When an individual permit is issued to a discharger otherwise subject to the construction stormwater general permit, the applicability of the construction stormwater general permit to that Permittee is automatically terminated on the effective date of the individual permit.

G23. APPEALS

- A.** The terms and conditions of this general permit, as they apply to the appropriate class of dischargers, are subject to appeal by any person within 30 days of issuance of this general permit, in accordance with Chapter 43.21B RCW, and Chapter 173-226 WAC.
- B.** The terms and conditions of this general permit, as they apply to an individual discharger, are appealable in accordance with Chapter 43.21B RCW within 30 days of the effective date of coverage of that discharger. Consideration of an appeal of general permit coverage of an individual discharger is limited to the general permit's applicability or nonapplicability to that individual discharger.
- C.** The appeal of general permit coverage of an individual discharger does not affect any other dischargers covered under this general permit. If the terms and conditions of this general permit are found to be inapplicable to any individual discharger(s), the matter shall be remanded to Ecology for consideration of issuance of an individual permit or permits.

G24. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

G25. BYPASS PROHIBITED

A. Bypass Procedures

Bypass, which is the intentional diversion of waste streams from any portion of a treatment facility, is prohibited for stormwater events below the design criteria for stormwater management. Ecology may take enforcement action against a Permittee for bypass unless one of the following circumstances (1, 2, 3 or 4) is applicable.

- 1. Bypass of stormwater is consistent with the design criteria and part of an approved management practice in the applicable stormwater management manual.
- 2. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limitations or other conditions of this permit, or adversely impact public health.

3. Bypass of stormwater is unavoidable, unanticipated, and results in noncompliance of this permit.

This bypass is permitted only if:

- a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
 - b. There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, maintenance during normal periods of equipment downtime (but not if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance), or transport of untreated wastes to another treatment facility.
 - c. Ecology is properly notified of the bypass as required in Special Condition S5.F of this permit.
4. A planned action that would cause bypass of stormwater and has the potential to result in noncompliance of this permit during a storm event.

The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

- a. A description of the bypass and its cause
 - b. An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.
 - c. A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
 - d. The minimum and maximum duration of bypass under each alternative.
 - e. A recommendation as to the preferred alternative for conducting the bypass.
 - f. The projected date of bypass initiation.
 - g. A statement of compliance with SEPA.
 - h. A request for modification of water quality standards as provided for in WAC 173-201A-110, if an exceedance of any water quality standard is anticipated.
 - i. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.
5. For probable construction bypasses, the need to bypass is to be identified as early in the planning process as possible. The analysis required above must be considered during

preparation of the Stormwater Pollution Prevention Plan (SWPPP) and must be included to the extent practical. In cases where the probable need to bypass is determined early, continued analysis is necessary up to and including the construction period in an effort to minimize or eliminate the bypass.

Ecology will consider the following before issuing an administrative order for this type bypass:

- a. If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
- b. If there are feasible alternatives to bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
- c. If the bypass is planned and scheduled to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve, conditionally approve, or deny the request. The public must be notified and given an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Approval of a request to bypass will be by administrative order issued by Ecology under RCW 90.48.120.

B. Duty to Mitigate

The Permittee is required to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

APPENDIX A – DEFINITIONS

AKART is an acronym for “All Known, Available, and Reasonable methods of prevention, control, and Treatment.” AKART represents the most current methodology that can be reasonably required for preventing, controlling, or abating the pollutants and controlling pollution associated with a discharge.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus, which was completed and approved by EPA before January 1, 2021, or before the date the operator’s complete permit application is received by Ecology, whichever is later. TMDLs completed after a complete permit application is received by Ecology become applicable to the Permittee only if they are imposed through an administrative order by Ecology, or through a modification of permit coverage.

Applicant means an *operator* seeking coverage under this permit.

Benchmark means a pollutant concentration used as a permit threshold, below which a pollutant is considered unlikely to cause a water quality violation, and above which it may. When pollutant concentrations exceed benchmarks, corrective action requirements take effect. Benchmark values are not water quality standards and are not numeric effluent limitations; they are indicator values.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control stormwater associated with construction activity, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Buffer means an area designated by a local jurisdiction that is contiguous to and intended to protect a sensitive area.

Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

Calendar Day A period of 24 consecutive hours starting at 12:00 midnight and ending the following 12:00 midnight.

Calendar Week (same as **Week**) means a period of seven consecutive days starting at 12:01 a.m. (0:01 hours) on Sunday.

Certified Erosion and Sediment Control Lead (CESCL) means a person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology (See BMP C160 in the SWMM).

Chemical Treatment means the addition of chemicals to stormwater and/or authorized non-stormwater prior to filtration and discharge to surface waters.

Clean Water Act (CWA) means the Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, and 97-117; USC 1251 et seq.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance.

Common Plan of Development or Sale means a site where multiple separate and distinct construction activities may be taking place at different times on different schedules and/or by different contractors, but still under a single plan. Examples include: 1) phased projects and projects with multiple filings or lots, even if the separate phases or filings/lots will be constructed under separate contract or by separate owners (e.g., a development where lots are sold to separate builders); 2) a development plan that may be phased over multiple years, but is still under a consistent plan for long-term development; 3) projects in a contiguous area that may be unrelated but still under the same contract, such as construction of a building extension and a new parking lot at the same facility; and 4) linear projects such as roads, pipelines, or utilities. If the project is part of a common plan of development or sale, the disturbed area of the entire plan must be used in determining permit requirements.

Composite Sample means a mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite" (collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquots).

Concrete Wastewater means any water used in the production, pouring and/or clean-up of concrete or concrete products, and any water used to cut, grind, wash, or otherwise modify concrete or concrete products. Examples include water used for or resulting from concrete truck/mixer/pumper/tool/chute rinsing or washing, concrete saw cutting and surfacing (sawing, coring, grinding, roughening, hydro-demolition, bridge and road surfacing). When stormwater combines with concrete wastewater, the resulting water is considered concrete wastewater and must be managed to prevent discharge to waters of the State, including groundwater.

Construction Activity means land disturbing operations including clearing, grading or excavation which disturbs the surface of the land (including off-site disturbance acreage related to construction-support activity). Such activities may include road construction, construction of residential houses, office buildings, or industrial buildings, site preparation, soil compaction, movement and stockpiling of topsoils, and demolition activity.

Construction Support Activity means off-site acreage that will be disturbed as a direct result of the construction project and will discharge stormwater. For example, off-site equipment staging yards, material storage areas, borrow areas, and parking areas.

Contaminant means any hazardous substance that does not occur naturally or occurs at greater than natural background levels. See definition of "hazardous substance" and WAC 173-340-200.

Contaminated soil means soil which contains contaminants, pollutants, or hazardous substances that do not occur naturally or occur at levels greater than natural background.

Contaminated groundwater means groundwater which contains contaminants, pollutants, or hazardous substances that do not occur naturally or occur at levels greater than natural background.

Demonstrably Equivalent means that the technical basis for the selection of all stormwater BMPs is documented within a SWPPP, including:

1. The method and reasons for choosing the stormwater BMPs selected.
2. The pollutant removal performance expected from the BMPs selected.

3. The technical basis supporting the performance claims for the BMPs selected, including any available data concerning field performance of the BMPs selected.
4. An assessment of how the selected BMPs will comply with state water quality standards.
5. An assessment of how the selected BMPs will satisfy both applicable federal technology-based treatment requirements and state requirements to use all known, available, and reasonable methods of prevention, control, and treatment (AKART).

Department means the Washington State Department of Ecology.

Detention means the temporary storage of stormwater to improve quality and/or to reduce the mass flow rate of discharge.

Dewatering means the act of pumping groundwater or stormwater away from an active construction site.

Director means the Director of the Washington State Department of Ecology or his/her authorized representative.

Discharger means an owner or operator of any facility or activity subject to regulation under Chapter 90.48 RCW or the Federal Clean Water Act.

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such groundwater infiltration or surface waters as may be present.

Ecology means the Washington State Department of Ecology.

Engineered Soils means the use of soil amendments including, but not limited, to Portland cement treated base (CTB), cement kiln dust (CKD), or fly ash to achieve certain desirable soil characteristics.

Equivalent BMPs means operational, source control, treatment, or innovative BMPs which result in equal or better quality of stormwater discharge to surface water or to groundwater than BMPs selected from the SWMM.

Erosion means the wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep.

Erosion and Sediment Control BMPs means BMPs intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, sediment traps, and ponds. Erosion and sediment control BMPs are synonymous with stabilization and structural BMPs.

Federal Operator is an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

Final Stabilization (same as **fully stabilized** or **full stabilization**) means the completion of all soil disturbing activities at the site and the establishment of permanent vegetative cover, or equivalent permanent stabilization measures (such as pavement, riprap, gabions, or geotextiles) which will prevent erosion. See the applicable Stormwater Management Manual for more information on vegetative cover expectations and equivalent permanent stabilization measures.

Groundwater means water in a saturated zone or stratum beneath the land surface or a surface waterbody.

Hazardous Substance means any dangerous or extremely hazardous waste as defined in RCW 70.105.010 (5) and (6), or any dangerous or extremely dangerous waste as designated by rule under chapter 70.105 RCW; any hazardous sub-stance as defined in RCW 70.105.010(14) or any hazardous substance as defined by rule under chapter 70.105 RCW; any substance that, on the effective date of this section, is a hazardous substance under section 101(14) of the federal cleanup law, 42U.S.C., Sec. 9601(14); petroleum or petroleum products; and any substance or category of substances, including solid waste decomposition products, determined by the director by rule to present a threat to human health or the environment if released into the environment. The term hazardous substance does not include any of the following when contained in an underground storage tank from which there is not a release: crude oil or any fraction thereof or petroleum, if the tank is in compliance with all applicable federal, state, and local law.

Injection Well means a well that is used for the subsurface emplacement of fluids. (See **Well**.)

Jurisdiction means a political unit such as a city, town or county; incorporated for local self-government.

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the State from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology.

Notice of Intent (NOI) means the application for, or a request for coverage under this general permit pursuant to WAC 173-226-200.

Notice of Termination (NOT) means a request for termination of coverage under this general permit as specified by Special Condition S10 of this permit.

Operator means any party associated with a construction project that meets either of the following two criteria:

- The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a SWPPP for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWPPP or comply with other permit conditions).

Permittee means individual or entity that receives notice of coverage under this general permit.

pH means a liquid's measure of acidity or alkalinity. A pH of 7 is defined as neutral. Large variations above or below this value are considered harmful to most aquatic life.

pH Monitoring Period means the time period in which the pH of stormwater runoff from a site must be tested a minimum of once every seven days to determine if stormwater pH is between 6.5 and 8.5.

Point Source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the State. This term does not include return flows from irrigated agriculture. (See the Fact Sheet for further explanation)

Pollutant means dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, domestic sewage sludge (biosolids), munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of section 312 of the CWA, nor does it include dredged or fill material discharged in accordance with a permit issued under section 404 of the CWA.

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the State; including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish or other aquatic life.

Process Wastewater means any non-stormwater which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. If stormwater commingles with process wastewater, the commingled water is considered process wastewater.

Receiving Water means the waterbody at the point of discharge. If the discharge is to a storm sewer system, either surface or subsurface, the receiving water is the waterbody to which the storm system discharges. Systems designed primarily for other purposes such as for groundwater drainage, redirecting stream natural flows, or for conveyance of irrigation water/return flows that coincidentally convey stormwater are considered the receiving water.

Representative means a stormwater or wastewater sample which represents the flow and characteristics of the discharge. Representative samples may be a grab sample, a time-proportionate *composite sample*, or a flow proportionate sample. Ecology's Construction Stormwater Monitoring Manual provides guidance on representative sampling.

Responsible Corporate Officer for the purpose of signatory authority means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Sanitary Sewer means a sewer which is designed to convey domestic wastewater.

Sediment means the fragmented material that originates from the weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.

Sedimentation means the depositing or formation of sediment.

Sensitive Area means a waterbody, wetland, stream, aquifer recharge area, or channel migration zone.

SEPA (State Environmental Policy Act) means the Washington State Law, RCW 43.21C.020, intended to prevent or eliminate damage to the environment.

Significant Amount means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a reasonable potential to cause a violation of surface or groundwater quality or sediment management standards.

Significant Concrete Work means greater than 1000 cubic yards placed or poured concrete or recycled concrete used over the life of a project.

Significant Contributor of Pollutants means a facility determined by Ecology to be a contributor of a significant amount(s) of a pollutant(s) to waters of the State of Washington.

Site means the land or water area where any "facility or activity" is physically located or conducted.

Source Control BMPs means physical, structural or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead end sump.

Stabilization means the application of appropriate BMPs to prevent the erosion of soils, such as, temporary and permanent seeding, vegetative covers, mulching and matting, plastic covering and sodding. See also the definition of Erosion and Sediment Control BMPs.

Storm Drain means any drain which drains directly into a *storm sewer system*, usually found along roadways or in parking lots.

Storm Sewer System means a means a conveyance, or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains designed or used for collecting or conveying stormwater. This does not include systems which are part of a *combined sewer* or Publicly Owned Treatment Works (POTW), as defined at 40 CFR 122.2.

Stormwater means that portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface waterbody, or a constructed infiltration facility.

Stormwater Management Manual (SWMM) or Manual means the technical Manual published by Ecology for use by local governments that contain descriptions of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.

Stormwater Pollution Prevention Plan (SWPPP) means a documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater.

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Temporary Stabilization means the exposed ground surface has been covered with appropriate materials to provide temporary stabilization of the surface from water or wind erosion. Materials include, but are not limited to, mulch, riprap, erosion control mats or blankets and temporary cover crops. Seeding alone is not considered stabilization. Temporary stabilization is not a substitute for the more permanent "final stabilization."

Total Maximum Daily Load (TMDL) means a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet state water quality standards. Percentages of the total maximum daily load are allocated to the various pollutant sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The TMDL calculations must include a "margin of safety" to ensure that the waterbody can be protected in case there are unforeseen events or unknown sources of the pollutant. The calculation must also account for seasonable variation in water quality.

Transfer of Coverage (TOC) means a request for transfer of coverage under this general permit as specified by Special Condition S2.A of this permit.

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, and constructed wetlands.

Transparency means a measurement of water clarity in centimeters (cm), using a 60 cm transparency tube. The transparency tube is used to estimate the relative clarity or transparency of water by noting the depth at which a black and white Secchi disc becomes visible when water is released from a value in the bottom of the tube. A transparency tube is sometimes referred to as a "turbidity tube."

Turbidity means the clarity of water expressed as nephelometric turbidity units (NTUs) and measured with a calibrated turbidimeter.

Uncontaminated means free from any contaminant. See definition of "contaminant" and WAC 173-340-200.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Waste Load Allocation (WLA) means the portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources of pollution. WLAs constitute a type of water quality based effluent limitation (40 CFR 130.2[h]).

Water-Only Based Shaft Drilling is a shaft drilling process that uses water only and no additives are involved in the drilling of shafts for construction of building, road, or bridge foundations.

Water Quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose.

Waters of the State includes those waters as defined as "waters of the United States" in 40 CFR Subpart 122.2 within the geographic boundaries of Washington State and "waters of the State" as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt

waters, and all other surface waters and water courses within the jurisdiction of the state of Washington.

Well means a bored, drilled or driven shaft, or dug hole whose depth is greater than the largest surface dimension. (See **Injection Well**.)

Wheel Wash Wastewater means any water used in, or resulting from the operation of, a tire bath or wheel wash (BMP C106: Wheel Wash), or other structure or practice that uses water to physically remove mud and debris from vehicles leaving a construction site and prevent track-out onto roads. When stormwater combines with wheel wash wastewater, the resulting water is considered wheel wash wastewater and must be managed according to Special Condition S9.D.9.

APPENDIX B – ACRONYMS

AKART	All Known, Available, and Reasonable Methods of Prevention, Control, and Treatment
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
CKD	Cement Kiln Dust
cm	Centimeters
CPD	Common Plan of Development
CTB	Cement-Treated Base
CWA	Clean Water Act
DMR	Discharge Monitoring Report
EPA	Environmental Protection Agency
ERTS	Environmental Report Tracking System
ESC	Erosion and Sediment Control
FR	Federal Register
LID	Low Impact Development
NOI	Notice of Intent
NOT	Notice of Termination
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SWMM	Stormwater Management Manual
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
UIC	Underground Injection Control
USC	United States Code
USEPA	United States Environmental Protection Agency
WAC	Washington Administrative Code
WQ	Water Quality
WWHM	Western Washington Hydrology Model

Appendix F: 303(d) List Waterbodies / TMDL Waterbodies Information

303(d) Listing for Port Gardner Bay

Main Listing Information

Listing ID: 504391

Waterbody Name: PORT GARDNER AND INNER EVERETT HARBOR

Medium: Sediment

Parameter: Sediment Bioassay

WQI Project: None

Designated Use: None

Collection Date: 10/6/2008

Year	Category
2014	5
2012	5
2008	2 Rank 4
2004	3
1998	Y
1996	N

Assessment Unit

Assessment Unit ID: 47122J211_SW **County:** Snohomish

WRIA: 7 - Snohomish

Basis Statement

Data from the Department of Ecology's Environmental Information Management (EIM) system samples

H=PortGardner_08*A1-10*A1-10-S*10/6/2008

M=NONE

L=NONE

indicate a total of 2 points for 1 samples collected on or before October 6, 2008 exceeds the Sediment Management Standards CSL bioassay criterion. This grid is in an area being investigated for sediment contamination, therefore it is assessed as Category 5. Statute: MTCA. This grid is in an area commonly known as Everett East Waterway. Site to be further investigated.

Remarks

2010: Comment #1009 - old bioassay data; new bioassay data available. Data submitted Apr2010.

Data Sources

No Source Records

Map Link



[Map Link \(https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=504391\)](https://apps.ecology.wa.gov/waterqualityatlas/wqa/map?lstid=504391)

Appendix G: Contaminated Site Information

G1 -Administrative Order

Amendment to Agreed Order No. DE 6184

Exhibit A of Amendment to Agreed Order No. DE 6184 (DRAFT: ExxonMobil ADC Site –
Port of Everett Property Interim Action Plan

G2 - Sanitary Discharge Permit

Discharge Authorization No. MD-46-2022 from City of Everett

G3 - Soil Management Plan

Not included as of 01/30/2024

G4 - Soil and Groundwater Reports

4.1 ExxonMobil ADC Site Revised Draft Cleanup Action Plan

4.2 ExxonMobil ADC Semiannual Groundwater Monitoring Report - First Half 2023

G5 -Maps and Figures Depicting Contamination

See Plate 3 Site Boundary Map of the DRAFT: ExxonMobil ADC Site – Port of Everett Property
Interim Action Work Plan for entire Ecology MTCA Site Boundary

**STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY**

In the Matter of Remedial Action by:

ExxonMobil Oil Corporation and
American Distributing Company

AMENDMENT TO AGREED ORDER for

Interim Action at
ExxonMobil/American Distributing Site

No. DE 6184

TO: ExxonMobil Oil Corporation
c/o Maria Quezada
U.S. West-Americas Americas South Business Manager
W3.2A E&PS Environmental Solutions
Springwood, TX 77389

and

American Distributing Company
13618 45th Avenue NE
Marysville, WA 98271

EXHIBITS

Exhibit A: Interim Action Work Plan and Schedule

I. INTRODUCTION

Agreed Order No. DE 6184 (2010 Order) entered into by the State of Washington, Department of Ecology (Ecology), ExxonMobil Oil Corporation (ExxonMobil) and American Distributing Company (American Distributing) (collectively the Parties) on March 16, 2010, requires ExxonMobil and American Distributing to conduct a supplemental Remedial Investigation and Feasibility Study, referred to as a Focused Feasibility Study, and develop a draft Cleanup Action Plan (DCAP) for the ExxonMobil/American Distributing Site (Site) in Everett, Washington.

ExxonMobil and American Distributing prepared a Site Characterization/Focused Feasibility Study (SC/FFS) dated June 11, 2021, for review and comment by the Department of Ecology (Ecology). ExxonMobil and American Distributing initially submitted a DCAP for Ecology review and comment on October 26, 2021. At the request of ExxonMobil and

American Distributing, Ecology has deferred approval of the DCAP to allow performance of the Interim Action required by this Amendment and a re-evaluation of the safety, engineering, and design for the proposed cleanup of the ExxonMobil/American Distributing properties.

Pursuant to Section VIII.L of the 2010 Order, the Parties hereby stipulate to an Amendment to the 2010 Order. By this Amendment, ExxonMobil and American Distributing will perform an interim remedial action at a facility where there has been a release or threatened release of hazardous substances.

This Amendment does not attempt to recite all of the provisions of the 2010 Order. Provisions of the 2010 Order not specifically changed in this Amendment remain in full force and effect.

VI. ECOLOGY DETERMINATIONS

F. Under WAC 173-340-430, an interim action is a remedial action that is technically necessary to reduce a threat to human health or the environment by eliminating or substantially reducing one or more pathways for exposure to a hazardous substance, that corrects a problem that may become substantially worse or cost substantially more to address if the remedial action is delayed, or that is needed to provide for completion of a site hazard assessment, RI/FS study or design of a cleanup action. The Port of Everett's (Port) property that is part of the ExxonMobil ADC Site (Site) is impacted with releases of hazardous substances above residual soil saturation levels which pose a risk to human health and the environment. Based on these circumstances, Ecology has determined that an interim action is permissible under WAC 173-340-430. ExxonMobil and American Distributing have proposed to perform an interim action as described in an Interim Action Work Plan and per the Schedule (Exhibit A). If Ecology approves the Interim Action Work Plan, the Parties are in agreement concerning the interim action and the Parties will follow the process in Section VII.E. If the Parties are not in agreement, Ecology reserves its authority to require additional interim action(s) under a separate order or other enforcement action under RCW 70A.305, or to undertake the interim action(s) itself.

VII. WORK TO BE PERFORMED

E. ExxonMobil and American Distributing have submitted to Ecology an Interim Action Work Plan, including a scope of work and schedule (Exhibit A). ExxonMobil and American Distributing shall not conduct the interim action until Ecology approves the Interim Action Work Plan. Upon approval by Ecology, the Interim Action Work Plan becomes an integral and enforceable part of this Order, and ExxonMobil and American Distributing are required to conduct the interim action in accordance with the approved Interim Action Work Plan.

Scope of Interim Action. In general, the interim action work will involve excavation of soil on the Port's property at the Site containing Light Non-Aqueous Phase Liquid (LNAPL) or residual LNAPL saturation determined in advance as shown on Figure 12 in the Interim Action Work Plan. The excavated soil will be transported and disposed at a licensed disposal facility authorized to accept such waste. Clean soil will be used to backfill the excavation area and an asphalt cap will be placed on top of the backfilled soil. A permanent barrier wall will be installed along Federal Avenue to limit LNAPL migration following the remedial excavation on the Port's property.

Effective date of this Amendment: June 21, 2022

**STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY**



Nicholas Acklam
Acting Section Manager
Toxics Cleanup Program
Land & Aquatic Lands Cleanup Section
300 Desmond Drive Southeast
Lacey, Washington 98503
360-407-7226

EXXONMOBIL OIL CORPORATION

DocuSigned by:

B72B9A6761774FA... _____
Maria Quezada

U.S. West-Americas Americas South Business Manager
W3.2A E&PS Environmental Solutions
Springwood, TX 77389
(832) 624-2948

AMERICAN DISTRIBUTING COMPANY

Steve Miller
American Distributing Company
13618 45th Avenue NE
Marysville, WA 98271
Phone: 360.658.3751

Amendment to Agreed Order No. DE 6184
Page 4 of 4

EXXONMOBIL OIL CORPORATION

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Marysville, WA 98271
Phone: 360.658.3751



June 9th, 2023

Stantec Consulting Services Inc.
309 South Cloverdale Street, Unit A13
Seattle, WA 98108

Subject: EXXONMobil ADC
Discharge Permit Construction Activities

Dear Mrs. Cole

Stantec is hereby authorized to discharge site related water from site remediation. Discharge will be allowed for the permit duration. The discharge will be approved upon the City's receipt of the signed acceptance of this letter and all requirements as listed herein have been met. No other water sources are allowed to be discharged under this authorization, other than what is listed above.

This authorization is based on the information you provided; we understand that this work is ongoing. Discharge will be allowed based on compliance with the conditions of this authorization and Sewer System Operations.

The point of discharge will be within the city's sewer collection system as directed by Fred Rapelyea and as shown on the attached Map

You will be billed for the amount discharged to the city sewers based on the total flow. Your sewer bill will be invoiced monthly and will be calculated on our current sewer rate (currently \$9.25 per 100 cubic feet) plus the industrial surcharge of \$0.19 per thousand gallons of flow.

You must meter and track the amount discharged to the city sewers. You must also always know the approximate flow rate, as we will need to know especially during wet weather conditions

This Discharge Authorization is issued with the following conditions:

- 1) You must comply with the general use and discharge requirements of the Industrial Pretreatment Ordinance #3070-08 as amended (attached), as well as any applicable Federal and State regulations.
- 2) The City solely reserves the right to modify, suspend, or terminate this authorization at any time once issued.
- 3) Your representative and point of contact for discharge is Fred Rapelyea at 425-257-8828 (cell at 425-583-7796) or frapelyea@everettwa.gov. You shall notify Fred prior to discharge and when your project is completed. You must also report monthly flows to frapelyea@everettwa.gov.
- 4) Discharge can only occur during non-rain impacted flow periods. Your point of contact will receive notification to immediately stop discharging within 30 minutes.

Public Works



3200 Cedar Street
Everett, WA 98201



425.257.8800
425.257.8882 fax



everettpw@everettwa.gov
everettwa.gov/pw

- 5) The point of discharge shall be as shown on attached map or as directed by the City's project representative and limited to a flow of **150 gallons per minute or less**. Higher rates must be first approved by Fred Rapelyea and will only be approved for limited durations based on existing system conditions.
- 6) **Approved Discharge will only be for water related to construction at the specific location identified in the DA application. Other sources must be pre-approved and may require a separate application and sampling.**
- 7) All flow shall be routed through a system designed to remove floatable particles and settleable solids or discharge must be free of floatable and settleable solids. Highland Civil or representatives shall monitor and prevent any floatable and settleable solids in the discharge and shall use an onsite storage tank for pre-settlement needs related to high sediment or turbidity prior to discharge to the City's sewers. The City will inspect the tank and volume prior to discharge; with the ability and permission to inspect during the work as needed. Contact Fred for inspection of the tank at least 24 hours in advance.
- 8) At any time, the City of Everett Representative can direct the point of discharge to an alternative location based on system operations.
- 9) Discharge operations shall comply with the City's Noise Ordinance and all existing permitted requirements as set forth by the City of Everett's Permitting Services
- 10) **Stantec** or representatives are solely responsible for spills of any kind related to their discharge operations, including reporting to Department of Ecology, clean-up, and any repairs or restoration, including but not limited to all costs incurred by the City of Everett to oversee and respond to discharges that are not covered within the approved Discharge Authorization **No. MD-56-2023**
- 11) City of Everett personnel may take samples of the effluent for analysis and may inspect your site to verify compliance at any time.
- 12) Maximum rate of flow shall not cause capacity problems in the receiving sewer or at any point downstream of the discharge; the City may modify the flow rate at any time based on sewer system operations.

13) The discharge is subject to these limits:

As	0.5	mg/L
Cd	0.24	mg/L
Cr	5.0	mg/L
Cu	3.0	mg/L
Pb	1.9	mg/L
Hg	0.1	mg/L
Ni	2.83	mg/L
Ag	0.49	mg/L
Zn	4.0	mg/L
CN-	0.65	mg/L
Nonpolar FOG	200	mg/L

- Should additional lab samples indicate higher than allowed discharge limits, then a treatment plan to bring the discharge below the allowable limits will be required.



- All discharge data from the site shall be reported. The total amount of flow to the sanitary sewer shall be reported at the completion of the discharge event including all data collected. Please remit all reports to the following:

Fred Rapelyea
Sewer and Drainage
Maintenance & Operations Manager
City of Everett
3200 Cedar Street
Everett, WA 98201

- 14) The City reserves the right to bill Stantec fees for the requested monitoring, inspections, or sampling outside normal operating hours of 7:30am to 4:00pm.
- 15) Highland Civil must install an acceptable flow meter rated for the nature of the discharge to accurately monitor the flow rate of discharge and report the monthly volumes to Fred Rapelyea. Fred Rapelyea must inspect and approve the meter installation prior to discharge. The meter shall not be removed or replaced without notifying the City first. Highland Civil will **not exceed 150 gallons per minute** and must keep a log for the discharge volumes noted. The log and amount of flow must be submitted to Fred Rapelyea monthly and at the end of the project.

Please contact me at 425 257-8828 (frapelyea@everettwa.gov) if you have any questions or need clarification of the requirements and limits of this discharge agreement.

Sincerely,

Fred Rapelyea, PM
Maintenance & Operations Supervisor



Date: 06/09/2023

Accepted By:



Date: 06/09/2023

Attachment: Discharge Location Map

cc: Gene Bennett, City of Everett
Jeff Marrs City of Everett
Grant Moen City of Everett
Chron File
IPT File



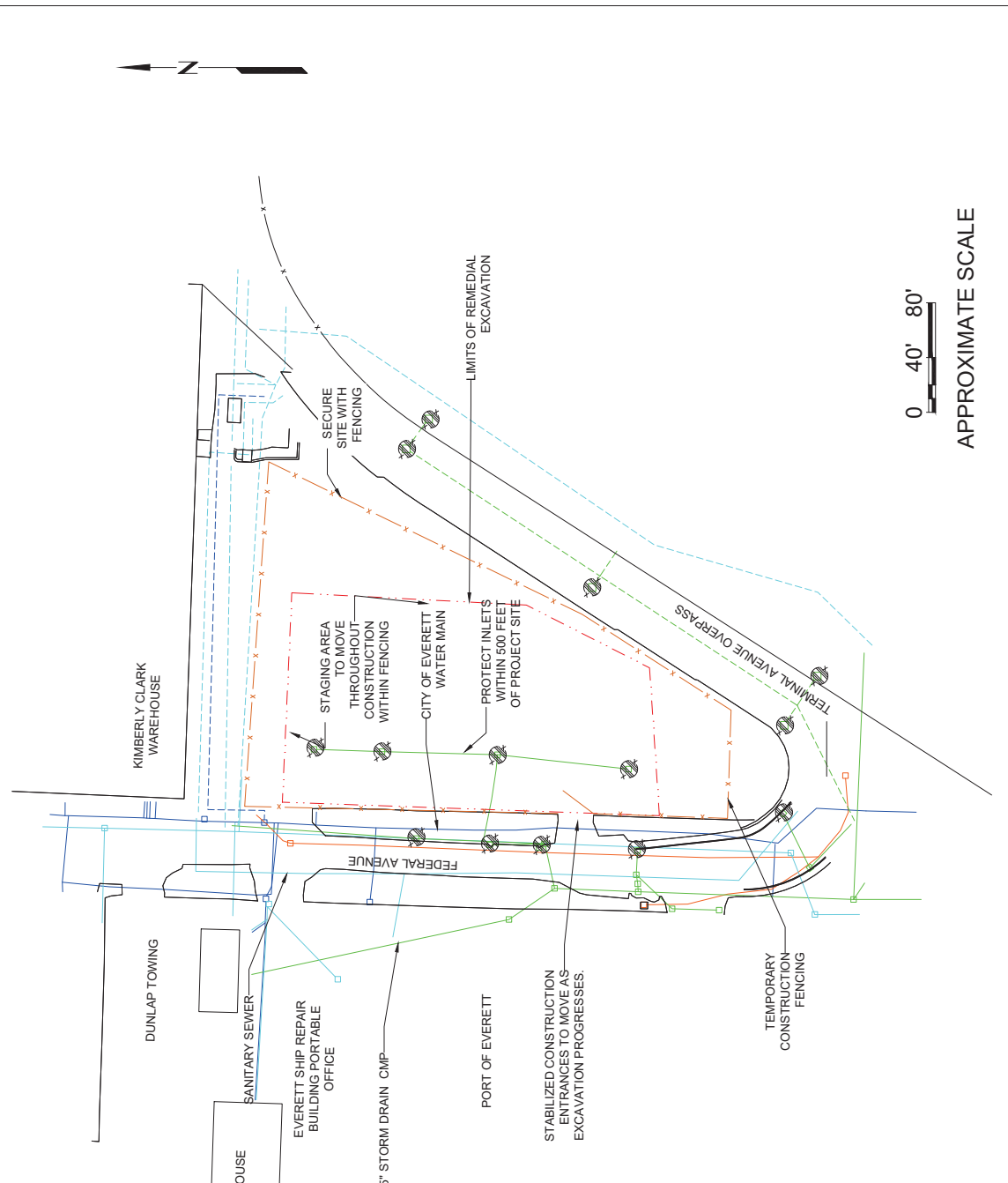
Appendix H: Engineering Calculations (Not applicable)

None included as of 01/30/2024

LEGEND:

- - - - - LIMIT OF EXCAVATION
- TEMPORARY CONSTRUCTION FENCE
- EXISTING STORMWATER SEWER
- EXISTING SANITARY SEWER
- EXISTING WATER

TOTAL SITE AREA (INCLUDING STAGING): 0.85 ACRES
 ELEMENT #1: PRESERVE VEGETATION/MARKING CLEARING LIMITS
 NO VEGETATION TO PROTECT. SEE STAGING PLANS
 1 THROUGH 4 FOR CONSTRUCTION FENCING
 ELEMENT #2: ESTABLISH CONSTRUCTION ACCESS:
 BMP C105: STABILIZED CONSTRUCTION ENTRANCE/EXIT
 NOT APPLICABLE TO PROJECT
 ELEMENT #3: CONTROL FLOW RATES:
 NOT APPLICABLE TO PROJECT
 ELEMENT #4: INSTALL SEDIMENT CONTROLS:
 NOT APPLICABLE TO PROJECT
 ELEMENT #5: STABILIZE SOILS:
 BMP C123: PLASTIC COVERING
 ELEMENT #6: PROTECT SOILS:
 NOT APPLICABLE TO PROJECT
 ELEMENT #7: PROTECT DRAIN INLETS
 BMP C220: STORM DRAIN INLET PROTECTION
 NOT APPLICABLE TO PROJECT
 ELEMENT #9: CONTROL POLLUTANTS
 BMP C152: SAWCUTTING AND SURFACING POLLUTION PREVENTION
 BMP C153: MATERIAL DELIVERY STORAGE AND CONTAINMENT
 ELEMENT #10: CONTROL DEWATERING
 GROUNDWATER AND RAINFALL IN EXCAVATION GENERATED WILL BE TREATED ON SITE
 WITH TREATMENT TECHNOLOGY PROPOSED BY CONTRACTOR, APPROVED BY CARDNO
 ELEMENT #11: MAINTAIN BMPs:
 BMP C150: MATERIALS ON HAND
 BMP C160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD
 ELEMENT #12: MANAGE THE PROJECT
 BMP C150: MATERIALS ON HAND
 BMP C160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD
 ELEMENT #13: PROTECT LOW IMPACT DEVELOPMENT
 NO EXISTING LID ELEMENTS ON SITE.



PROJECT NO.	238000337.R15
TITLE SHEET	0
DATE	06/23/23
DESIGNER	WOTISHNA PBDLLA
DATE	06/23/23
APPROVED:	

REVISIONS	
NO.	
DATE	
DESCRIPTION	

C-2	Scale: 1" = 40"
TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN	
EXXONMOBIL ADC 2717 AND 2731 Federal Avenue Everett, Washington	
Sheet C2	

APPENDIX K

Discharge Authorization





June 9th, 2023

Stantec Consulting Services Inc.
309 South Cloverdale Street, Unit A13
Seattle, WA 98108

Subject: EXXONMobil ADC
Discharge Permit Construction Activities

Dear Mrs. Cole

Stantec is hereby authorized to discharge site related water from site remediation. Discharge will be allowed for the permit duration. The discharge will be approved upon the City's receipt of the signed acceptance of this letter and all requirements as listed herein have been met. No other water sources are allowed to be discharged under this authorization, other than what is listed above.

This authorization is based on the information you provided; we understand that this work is ongoing. Discharge will be allowed based on compliance with the conditions of this authorization and Sewer System Operations.

The point of discharge will be within the city's sewer collection system as directed by Fred Rapelyea and as shown on the attached Map

You will be billed for the amount discharged to the city sewers based on the total flow. Your sewer bill will be invoiced monthly and will be calculated on our current sewer rate (currently \$9.25 per 100 cubic feet) plus the industrial surcharge of \$0.19 per thousand gallons of flow.


You must meter and track the amount discharged to the city sewers. You must also always know the approximate flow rate, as we will need to know especially during wet weather conditions

This Discharge Authorization is issued with the following conditions:

- 1) You must comply with the general use and discharge requirements of the Industrial Pretreatment Ordinance #3070-08 as amended (attached), as well as any applicable Federal and State regulations.
- 2) The City solely reserves the right to modify, suspend, or terminate this authorization at any time once issued.
- 3) Your representative and point of contact for discharge is Fred Rapelyea at 425-257-8828 (cell at 425-583-7796) or frapelyea@everettwa.gov. You shall notify Fred prior to discharge and when your project is completed. You must also report monthly flows to frapelyea@everettwa.gov.
- 4) Discharge can only occur during non-rain impacted flow periods. Your point of contact will receive notification to immediately stop discharging within 30 minutes.

Public Works

 3200 Cedar Street
Everett, WA 98201

 425.257.8800
425.257.8882 fax

 everettpw@everettwa.gov
everettwa.gov/pw

- 5) The point of discharge shall be as shown on attached map or as directed by the City's project representative and limited to a flow of **150 gallons per minute or less**. Higher rates must be first approved by Fred Rapelyea and will only be approved for limited durations based on existing system conditions.
- 6) **Approved Discharge will only be for water related to construction at the specific location identified in the DA application. Other sources must be pre-approved and may require a separate application and sampling.**
- 7) All flow shall be routed through a system designed to remove floatable particles and settleable solids or discharge must be free of floatable and settleable solids. Highland Civil or representatives shall monitor and prevent any floatable and settleable solids in the discharge and shall use an onsite storage tank for pre-settlement needs related to high sediment or turbidity prior to discharge to the City's sewers. The City will inspect the tank and volume prior to discharge; with the ability and permission to inspect during the work as needed. Contact Fred for inspection of the tank at least 24 hours in advance.
- 8) At any time, the City of Everett Representative can direct the point of discharge to an alternative location based on system operations.
- 9) Discharge operations shall comply with the City's Noise Ordinance and all existing permitted requirements as set forth by the City of Everett's Permitting Services
- 10) **Stantec** or representatives are solely responsible for spills of any kind related to their discharge operations, including reporting to Department of Ecology, clean-up, and any repairs or restoration, including but not limited to all costs incurred by the City of Everett to oversee and respond to discharges that are not covered within the approved Discharge Authorization **No. MD-56-2023**
- 11) City of Everett personnel may take samples of the effluent for analysis and may inspect your site to verify compliance at any time.
- 12) Maximum rate of flow shall not cause capacity problems in the receiving sewer or at any point downstream of the discharge; the City may modify the flow rate at any time based on sewer system operations.

13) The discharge is subject to these limits:

As	0.5	mg/L
Cd	0.24	mg/L
Cr	5.0	mg/L
Cu	3.0	mg/L
Pb	1.9	mg/L
Hg	0.1	mg/L
Ni	2.83	mg/L
Ag	0.49	mg/L
Zn	4.0	mg/L
CN-	0.65	mg/L
Nonpolar FOG	200	mg/L

- Should additional lab samples indicate higher than allowed discharge limits, then a treatment plan to bring the discharge below the allowable limits will be required.



- All discharge data from the site shall be reported. The total amount of flow to the sanitary sewer shall be reported at the completion of the discharge event including all data collected. Please remit all reports to the following:

Fred Rapelyea
Sewer and Drainage
Maintenance & Operations Manager
City of Everett
3200 Cedar Street
Everett, WA 98201

- 14) The City reserves the right to bill Stantec fees for the requested monitoring, inspections, or sampling outside normal operating hours of 7:30am to 4:00pm.
- 15) Highland Civil must install an acceptable flow meter rated for the nature of the discharge to accurately monitor the flow rate of discharge and report the monthly volumes to Fred Rapelyea. Fred Rapelyea must inspect and approve the meter installation prior to discharge. The meter shall not be removed or replaced without notifying the City first. Highland Civil will **not exceed 150 gallons per minute** and must keep a log for the discharge volumes noted. The log and amount of flow must be submitted to Fred Rapelyea monthly and at the end of the project.

Please contact me at 425 257-8828 (frapelyea@everettwa.gov) if you have any questions or need clarification of the requirements and limits of this discharge agreement.

Sincerely,

Fred Rapelyea, PM
Maintenance & Operations Supervisor



Date: 06/09/2023

Accepted By:



Date: 06/09/2023

Attachment: Discharge Location Map

cc: Gene Bennett, City of Everett
Jeff Marrs City of Everett
Grant Moen City of Everett
Chron File
IPT File



APPENDIX L

Stantec Health and Safety Plan

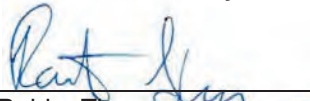


Health and Safety Plan

**ExxonMobil ADC
2717 Federal Avenue
Everett, Washington 98201**

Revision: January 19, 2024

Emergency Contact Information:



Bobby Thompson

January 19, 2024
Date

(206) 510-5855
Telephone Number

**Stantec
Approval:**

**Project Manager: or
HSSE Representative or
Site Supervisor**



Laina Cole

January 19, 2024
Date

(253) 247-1466
Telephone Number

Amendments or modifications to this plan may be written on a separate page and attached to this plan. Any amendments or modifications must be reviewed and approved by the personnel named above.

Safety Objectives

1. The first and foremost priority during this project is to maintain a safe and healthy work environment.
2. Work will not be performed until every necessary safety precaution has been taken.
3. No project objectives will knowingly be allowed to put at risk human health or the environment.

Document History

Version	Effective Date	Description of Revision
v13	11/11/2015	Includes 2015 OIMS Upgrades 4.5 Chemical Use – Added secondary containment instructions 9.2.1 Site Security – Updated 9.2.2 Personal Security – Added undocumented immigrants action 9.2.6 Limited or No Cell Service – New 9.3 Neighborhood Impact – New
v14	06/06/2016	9.2.1 Site Security – Added OIMS Risk Assessment 9.3 Neighborhood Impact – Updated
v15	09/18/2018	Includes 2017 and 2018 OIMS Upgrades 1.2 Confined Space Entry – Removed Corporate approval for non-permit required work 1.3 Life Saving Actions – Replaced Core Safety Expectations with Life Saving Actions 3.1 Employee and Worker Training – LPS and Work Permit refreshers to 3 years 3.4 Work Permit System – Removed Subsurface and added LO/TO, replace Critical Lift with Cranes and Lifting 4.6 Fall Protection – Added ExxonMobil Working from Heights definitions 6 PPE – Modified goggle requirement to apply to liquids, not anytime we are working with soil 9.1 Work Zones – New General, Drilling, and HEEZ 10.3 Possible Explosive Atmospheres – Updated LEL to 5% 10.5 Heat Stress Program – Revised 8/24/18 B ExxonMobil Work Permit Forms – Replaced with new forms G Heat Stress Protocol – Revised 8/24/18
v16	01/10/2020	Emergency telephone numbers and routes to occupational clinic and hospital moved to beginning of document 1.3 Life Saving Actions – Updated Life Saving Actions 6 PPE – Modified minimum PPE requirements including potential downgrades 7.3 Respirator – Added checks throughout day, increase during hot/humid conditions 9.1 Works Zones – New Working Near Moving Equipment and Overhead Electrical Lines
V17	03/21/2023	Removed Cardno references and replaced with Stantec. Removed Core Health and replaced with WorkCare. 4.4.11 Asbestos – Added wording regarding compliance with all laws and training requirements 4.4.13 Chloride – Added a chloride section 6 Fixed Appendix reference H Fixed typo
V17.1	04/27/2023	10.3 Update LEL stop work to 5% A Replaced with updated tailgate form (2023) B Replaced with updated ExxonMobil Work Permit Forms (2021) D Updated Care Management contact number to WorkCare

Emergency Telephone Numbers

On-site Emergency Contact (if available at operating facility)	N/A
Fire and Police	911
Local Police Number – Everett Police Department North Precinct.....	(425) 257-8400
Local Fire Department Number – Everett Fire Department.....	(425) 257-8100
(Verify the department you contact provides coverage for your site address)	
Stantec Nurse	(888) 449-7787

Employees who require first aid/medical treatment which is not life threatening are to use the listed occupational medical clinic during hours of operation. When work is occurring outside operational days and times of the listed occupational clinic, employees are directed to seek medical professional assistance at the hospital's emergency services location as the 24-hour alternative listed below.

Occupational Medical Clinic

The Everett Clinic Primary Care	(425) 259-0966
---------------------------------------	----------------

4027 Hoyt Avenue
Everett, WA 98201
M–F: 08:00 – 17:00 / Sat-Sun: Closed

Hospital

Providence Regional Medical Center	(425) 259-0966
--	----------------

1700 13th Street
Everett, WA 98201

Local Public Utility Service Providers:

Gas Number – Puget Sound Energy and Electric	(888) 225-5773
Electric Utility Number – Snohomish County PUD	(425) 783-1000
Sewer/Water Number – City of Everett.....	(425) 257-8999
Cable/TV Number – Comcast	(800) 283-4237
Telecommunications Number – Astound Broadband by Wave	(866) 928-3123

Neighbor Contact Numbers: (Client Approval Required)

Does the project require neighbors contact information to be provided in this plan **No**

Additional Contingency Telephone Numbers:

Stantec – Seattle, Washington	(800) 499-8950
ExxonMobil – Jeff Johnson	(815) 860-7290
Washington Department of Labor and Industries – Everett	(425) 290-1300

Chemical Transportation Emergency Center (CHEMTREC).....(800) 424-9300

Note: CHEMTREC is a public service of the American Chemistry Council (formerly known as the Chemical Manufacturers Association). CHEMTREC can usually provide hazard information, warnings, and guidance when given the identification number or the name of the product and the nature of the problem. CHEMTREC can also get personnel in contact with the appropriate experts.

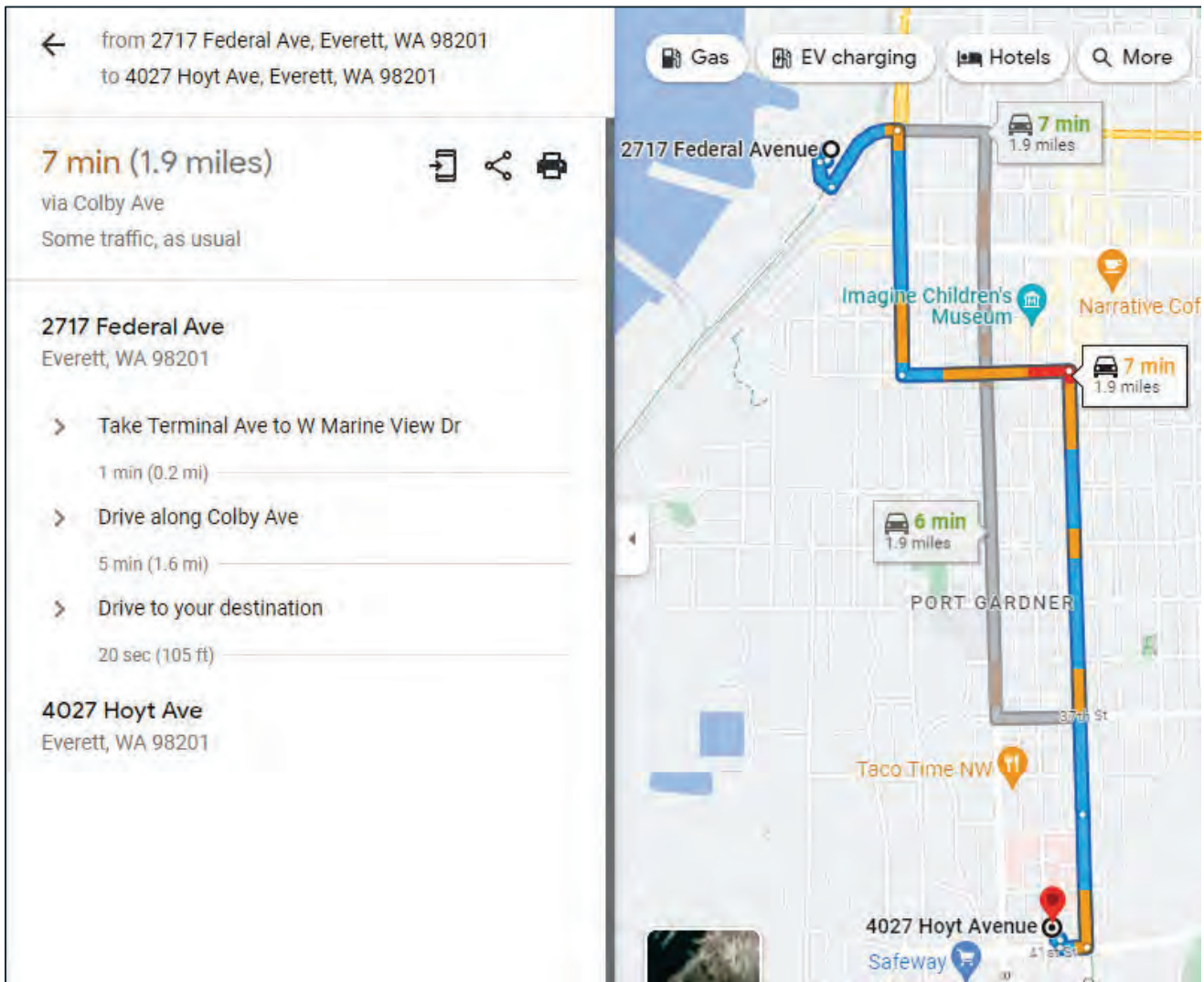
Spill Reporting Telephone Numbers:

Washington State Department of Ecology

Northwest Regional Office

Environmental Reports (ERTS): (206) 594-0000 / nwroerts@ecy.wa.gov

Emergency Route to Occupational Medical Clinic

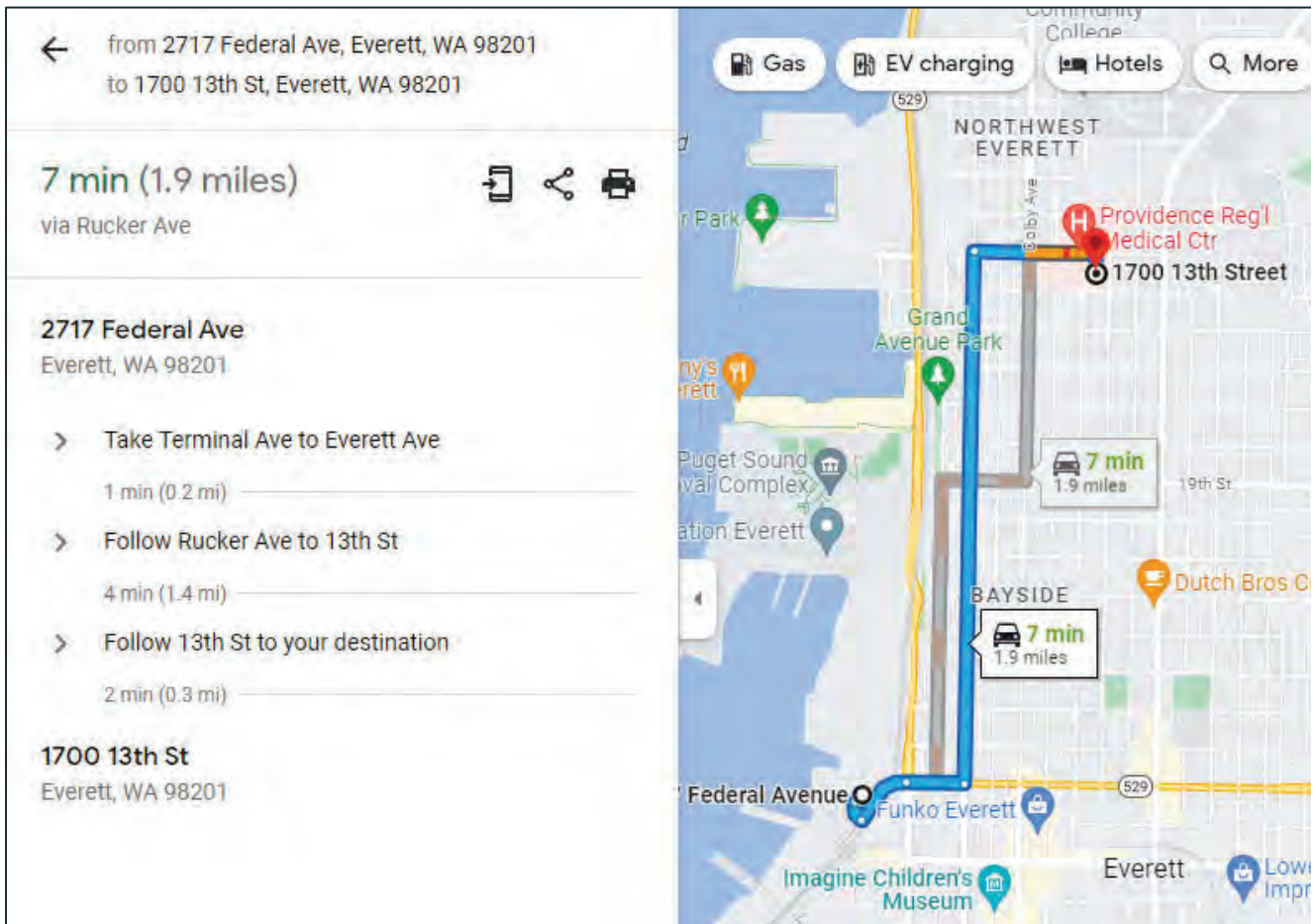


DIRECTIONS:

1. When exiting site take a left getting on Federal Avenue.
2. Take a left getting on Terminal Avenue and go up the street.
3. Take a left going down West Marine Drive.
4. When you reach Pacific Avenue take another left going east.
5. When you reach Colby Avenue take a right onto 41st Street.
6. Going down 41st Street it should be about 200 feet and you will take a last right to enter the property.

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Emergency Route to Hospital



DIRECTIONS:

1. When exiting site, take a left getting on Federal Avenue.
2. Take a left and get on Terminal Avenue.
3. Keep going straight becoming Everett Avenue.
4. When you reach Rucker Avenue take a left.
5. Keep going straight until you reach 13th Street and take a right.
6. Going through 13th Street you will reach the hospital.

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Appendix B	ExxonMobil Work Permit Forms
Appendix C	Task-Specific Job Loss Analysis Sheets
Appendix D	Geographical Biological Hazards Information Sheets
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Appendix F	Personal Protective Clothing/Gloves Inspection, Donning, and Doffing Procedures
Appendix G	Heat Stress Protocol and Prevention Plans
Appendix H	Cold Stress Protocol
Appendix I	Typical Noise Level Measurements from Construction-Related Equipment
Appendix J	Care Management Forms

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1 Introduction

- > The work site is currently a paved lot in an area that is owned by the American Distributing Company (North) and ExxonMobil (South).
- > 2717 Federal Avenue is approximately a 100m-by-100m area.
- > The property historically operated as a bulk petroleum storage, transfer, and distribution facility and contains total petroleum hydrocarbons (TPH) as gasoline, diesel, and motor oil (TPHg, TPHd, TPHmo), benzene, total xylenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and lead in soil and groundwater. Additionally, ethylbenzene has been detected exceeding the MTCA Method A Cleanup Level in soil. Laboratory preservative including sodium bisulfate, hydrochloric acid, methanol, and nitric acid may be used for soil and groundwater sampling.
- > Access to Port of Everett will need a TWIC to be able to gain access to monitoring wells located on the Everett Ship Repair and Dunlap Towing leased properties.

This health and safety plan (HASP) was created in compliance with the Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1910.120 relevant state regulatory codes to describe the safety and health requirements of each phase of operation including the requirements and procedures for employee protection. The provisions set forth in this plan apply to the employees of Stantec and its subcontractors working to conduct the following tasks: Soil Sampling, General Site Activities, Groundwater Slug Tests, Drum Management, Boring, Gauging, Utility Locating, Remedial Excavation, Soil Loading and Offloading, Sheet Pile Shoring Installation, Resurfacing and Site Restoration, Well Installation and Decommissioning, Soil Vapor Assessment, and Miscellaneous Demolition Activities. Subcontractors may elect to modify these provisions or have a separate supplemental health and safety plan, but only to upgrade or increase the safety requirements, and only with the concurrence of Stantec, as designated and accepted in writing.

This HASP will address the expected potential hazards that may be encountered at the work site for this project. If changes in site or working conditions occur as activities progress, addenda to this plan will be provided by Stantec.

This HASP must be on site anytime employees are present to work at or access the site.

1.1 Authority for Site Safety

The Project Manager and the Site Supervisor are responsible for project safety. The Stantec Health, Safety, Security, and Environment (HSSE) team is responsible for the overall Stantec Health and Safety Program and may choose to audit the site for compliance and take appropriate action to correct deficiencies. The Project Manager is responsible for implementing the provisions of this plan, for providing a copy of this plan to the Site Supervisor, and for advising the Site Supervisor on health and safety matters. The Project Manager and Site Supervisor have the authority to audit site activities for compliance with the provisions of this plan. They may suspend or modify work practices or dismiss subcontractors whose conduct does not meet the requirements specified in this plan.

The Site Supervisor is responsible for communicating the information contained in this plan to Stantec personnel assigned to this project and to the responsible representative of each subcontractor working for Stantec on this project.

The Site Supervisor will be the senior Stantec employee on site and is responsible for addressing the following items:

- > Implementing this HASP, company policies, and procedures
- > Requiring and maintaining adequate safety supplies and equipment inventory on site
- > Conducting daily safety and orientation meetings and advising workers regarding hazards
- > Site control, decontamination, and contamination reduction procedures
- > Reporting accidents or incidents
- > Conducting inspections to determine the effectiveness of the HASP and to report any deficiencies to the Stantec HSSE Representative for correction
- > Evaluate presentation of site safety and orientation meeting by Short Service Worker (SSW) if present. An SSW is an employee or subcontractor employee that meets at least one of the follow criteria:
 - An employee who has not graduated to a Site Safety Mature Person
 - A worker who has previously worked for ExxonMobil but has not done so for more than 2 years.

The Site Supervisor does not act as the Confined Space Supervisor for subcontractor work.

All personnel working on site have the authority to suspend work at any time that he or she finds the provisions of the plan are inadequate for worker safety. The Site Supervisor will promptly inform the Project Manager and the Stantec HSSE Representative of deficiencies within the plan or individuals or subcontractors whose conduct is not consistent with the requirements of this plan.

1.2 Confined Space Entry

Stantec personnel are not allowed to enter or perform work in an OSHA permit-required confined space without direct authorization from an Officer of Stantec. A separate confined space entry permit will need to be completed for Stantec personnel to conduct work. This HASP does not cover confined space hazards, protocols, or emergency procedures. Subcontractors who are under contract to conduct confined space entry are required to have their confined space entry site safety plan sent to Stantec prior to commencing with any work. Their site safety plan will be on site and will be the governing document to be followed for specific task(s) involving permit-required confined space entry.

1.3 Life Saving Actions

Stantec personnel are required to ensure our personnel along with any division of Stantec or our subcontractors strictly adhere to ExxonMobil's Life Saving Actions. Intentional failure to comply with the following Life Saving Actions is grounds for immediate dismissal from the project site with additional internal disciplinary or contractual actions being taken depending on the affiliation of the offending party. Immediate reporting of Life Saving Action violations is to be made to your Program Manager or the Stantec HSSE Representative. The eight Life Saving Actions are:

1. **Prevent Falls & Dropped Objects:** Use fall protection; secure tools and materials
2. **Protect from Moving Equipment/Vehicles:** Establish and control red zones and/or traffic
3. **Restrict Access to Suspended Loads:** Establish and control crush and drop zones
4. **Dig with Caution:** Locate underground hazards, prevent collapse
5. **Isolate Energized Systems:** Lock out, tag out, confirm zero energy state
6. **Prevent Hot Work Explosions/Fires:** Remove flammable materials; gas test
7. **Establish/Maintain Safe Confined Space:** Test and monitor atmosphere
8. **Respect Critical Safety Devices:** Follow defeat procedures



2 Medical Surveillance

Stantec personnel and subcontractors engaged in Hazardous Waste Operations and Emergency Response (HAZWOPER) project activities must participate in a medical surveillance program and must be cleared by the examining physician(s) to wear respiratory protection devices and protective clothing for working with hazardous materials. The applicable requirements under applicable state regulatory codes and 29 CFR 1910.120 will be observed.

3 Safety and Orientation Meeting

Stantec field personnel and subcontractors will attend a safety and orientation meeting (meeting) for safety and health issues and will review the project tasks before beginning work. The meeting will review the applicable sections of this HASP and include the completion of the Daily Site Safety Meeting Engagement Form (Appendix A). The meeting will be led by the SSW (if present), Project Manager, or Site Supervisor.

3.1 Employee and Worker Training

During the safety and orientation meeting described in Section 3, the Site Supervisor will confirm all employees and subcontractors working on site have the following current certifications of employee training depending on work being performed and exposure risk.

1. **40-hour HAZWOPER card or certificate:** Initial (with three days of documented supervision) or 8-hour refresher card (renewed annually) for general site workers. These workers engage in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances.
2. **Workers who are engaged in activities which will not expose or potentially expose** workers to hazardous substances over the permissible exposure limits (PELs) are not required to have HAZWOPER certification. Typical activities where this would occur are subcontractors for: land surveying, geophysical surveying, landscaping services, asphalt/concrete work (does not include saw cutting), crane operations, deliveries of equipment or materials, or trucking operations where drivers remain in their cab during loading or unloading operations. Additionally, workers that will not be exposed to impacted vapor, soil, or water (including groundwater) and will not enter remediation compounds.
3. **Current LPS Certification:** Current Loss Prevention System (LPS) certification is required for all workers on site. There are three levels of certification available: Manager/Supervisor, Standard, and Basic (<6 months on site in a calendar year). Stantec will have at least one person trained to the Manager/Supervisor level. Basic training will be allowed based on risk as determined by Stantec and the client Project Manager. Certification is not required for equipment or material delivery services, such as FedEx, UPS, rental equipment, regulatory agency representatives, or property owners.
4. **First Aid/CPR:** At least one employee or subcontractor will be certified in first aid and CPR (cardiopulmonary resuscitation) and be available on site while work is being conducted per 10 employees.
5. **ExxonMobil Work Permit Training:** Work permit issuance requires training for two roles: only personnel trained as the issuer or the recipient are allowed to issue or receive permits, respectively. Refresher training is required every 3 years.
6. **Tools and Equipment:** All personnel operating tools and equipment shall be deemed competent by their employer and shall show proof of training prior to engaging those activities requiring that expertise.

Employees or subcontractors who cannot provide proof of training **are not allowed** on site or within the exclusion zone and **are not permitted to conduct any work**.

3.2 Site Visitors

Any personnel or visitors who wish to gain access to established exclusion zones must obtain the authorization of the Site Supervisor, are required to attend the safety and orientation meeting, and meet all other

requirements listed within this HASP, such as wearing required personal protective equipment (PPE) as established by the JLA(s). Training requirements are addressed in Section 3.1.

Authorized visitors to the exclusion zone are the client and federal, state, or local government agents. Other visitors may be authorized to enter the exclusion zone at the discretion of the Site Supervisor, but work must be stopped before entry. If visitors do not meet the minimum requirements as listed within this HASP, they are not allowed within exclusion zones.

3.3 Emergency Relocation Area

In the event that there is an emergency where a fire, significant release, or safety hazard exists at the site, all personnel will assemble at the location identified during the safety and orientation meeting. Factors to consider are:

- > Direction of wind (locate up wind)
- > Proximity to traffic (should not be in the way of emergency vehicles or exposed to street vehicle hazards)
- > Presence of overhead structures (avoid)

Location of emergency (should be at a sufficient distance from the incident area that personnel won't be affected, and not be downhill where a release could move towards you).

3.4 Work Permit System

Evaluation of site activities requires the issuance and compliance with ExxonMobil's work permit system. A blank work permit is included in Appendix B. A work permit must be issued for any work conducted on site, except for low-risk activities such as:

- > Site visits
- > Visual inspection of equipment
- > LPS Tasks
- > Surveying (i.e., line location)
- > Snow removal
- > Lower risk commercial site maintenance
- > Mowing at a non-operational facility
- > Drum pick up
- > Equipment delivery only

If any of the activities listed below are preformed, they will need to have the respective High Risk Checklist (HRC) completed along with the work permit:

- > Excavation
- > Working Near Moving Equipment
- > Hot Work
- > Energy Isolation
- > Confined Space / Permit-Required Confined Space Entry
- > Working at Heights
- > Lifting and Rigging

It is the responsibility of the permit issuer to complete the work permit and any supplemental HRCs if required by work task. Upon completion, the permit issuer and recipient will review and sign off on the permit before work starts. By approving the permit, the issuer and recipient are agreeing that all site conditions are safe to conduct work. It is the permit recipient's responsibility to share the work permit information to all employees and subcontractors working on site and confirm their knowledge of the permit operational and stop work conditions. The permit issuer is responsible for verifying permit conditions, and documenting on the work permit in the Section G (Permit Compliance Inspection) within the first four hours of operations. A compliance inspection is not required for lone workers, or if the work will be less than four hours in duration. Upon completion of the permitted task, the permit issuer and recipient must close out the permit and HRCs (if applicable), confirming the project site is safe and secure.

3.5 Cell Phone Use Policy

Cell phones are allowed on site and in the exclusion zone under the provisions outlined in this section.

No cell phones will be answered inside a work area or exclusion zone, not including the O&M exception.⁶

No cell phones are allowed in environments where there is a possible explosive atmosphere.

Cell Phone Use - Mandatory On-Site Policy:

1. Cell phones are to be put on vibrate.
2. Cell phones can be used as timekeepers.
3. When a call comes in and it is SAFE to do so:
 - a. Silence your alarm.
 - b. Call stop work when there is a logical break in work process and you are able to get the attention of any employee and/or subcontractors without creating a hazard.
 - c. Once work is stopped, leave the exclusion zone and go to a safe location to return the call. A safe location is defined as an area outside the exclusion zone or work area, out of traffic paths, and out of any line-of-fire risks.
4. Follow steps 3(b) and 3(c) if you want to initiate a call; this applies to all on-site personnel.
5. This policy is to be covered during the safety and orientation meeting.
6. O&M personnel are allowed to use cell phones inside a compound to make an emergency call or troubleshoot equipment.

4 Hazard Risk Assessment

4.1 General

The major hazards expected to be encountered on this project are addressed in the task-specific Job Loss Analysis (JLA) sheets included in Appendix C. The JLAs, depending on the task(s), may list additional PPE not identified in this HASP. Wear the highest level of protection prescribed by either document.

The major chemicals expected to be encountered on this project are total petroleum hydrocarbons (TPH as TPHg, TPHd, TPHmo), benzene, total xylenes, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and lead in soil and groundwater. Additionally, ethylbenzene has been detected exceeding the MTCA Method A Cleanup Level in soil. Anticipated chemicals and their exposure standards are listed in Table 1 (Section 4.4).

Potential levels of exposure are not anticipated to reach the PEL or threshold limit values (TLV). Inhalation and dermal contact are the most prevalent exposure pathways. Protective clothing will be mandatory for field personnel as specified in Section 6.

Respiratory protective devices are required to be worn by each person on site or to be within easy reach should monitoring of breathing air approach any PELs, irritating odors are detected, or irritation of the respiratory tract occurs.

Hearing conservation program adherence is mandatory to comply with this HASP (Section 8). The anticipated level and duration of noise exposure and which hearing protective devices will be worn will be discussed during the safety and orientation meeting.

4.2 Biological

For the purposes of this HASP, biological hazards presented in this section are for commonplace hazards which can be present at any work site (e.g., biting and stinging insects, blood borne pathogens, or infectious agents). Additional information incorporating geographic specific biological hazards such as venomous snakes, stinging and biting insects, and poisonous flora and fauna are incorporated into Appendix D – Geographic Biological

Hazards Information Sheets. It is required that geographic-specific biological hazards that could be encountered are identified and are referenced in Appendix D.

4.2.1 Stinging and Biting Insects

While everyone considers being bitten or stung by an insect unpleasant, we need to be aware of the more serious ramifications of such events. Here are a few tips on how to avoid being bitten or stung:

- > Wear gloves, long sleeves, neck covering, and pants.
- > Tuck pants into boots or socks.
- > Wear white or light colors.
- > Do not wear cologne or perfume.
- > Use insect repellent.
- > Do not swat at insects.
- > Do not reach under objects that you have not inspected first.
- > Adjust working time to early morning or late afternoon when insects are less active.
- > Keep sites maintained by minimizing brush and tall grass

If a nest or excessive number of stinging or biting insects are identified on site, work shall be stopped. The Project Manager shall be notified and options for reducing exposure to the insects, such as avoiding the area or having the nest removed shall be evaluated.

One serious consequence of insect stings is anaphylaxis, a severe life-threatening allergic reaction. Symptoms of anaphylaxis include feeling faint or passing out, difficulty breathing, swelling of the tongue, hives, wheezing, and/or coughing. Symptom onset may occur within seconds and usually within twenty minutes. Individuals who have had severe reactions to previous stings should keep an anaphylaxis kit (e.g., Ana-Kit or Epi-Pen) nearby if there is any risk of a sting. If stung, epinephrine should be injected into the muscle of the upper outer thigh. Any individual requiring use of an anaphylaxis kit requires a 911 call or facility emergency response number to be placed.

For non-anaphylaxis reaction, application of ice to the sting location can help minimize the effects of the poison as well as taking an over-the-counter antihistamine. If an employee or subcontractor is stung, the care management practices described in Section 13 of this plan shall be followed.

4.2.2 Infectious Agents

Serious illness can occur after exposure to various infectious agents found in some rodent and bird droppings. One situation to be concerned about is a site covered in large amounts of droppings from rodents or pigeons. This situation typically occurs at closed or vacant sites where structures have not been occupied for long periods of time.

When droppings are disturbed, in addition to dust and other materials becoming airborne, various fungi, bacteria, and viruses are also typically put into the air, which can be breathed in by the worker. Prohibited actions include:

- > Entering buildings with visible dropping on horizontal surfaces.
- > Dry sweeping in locations where bird and rodent dropping are present.

Three human diseases are known to be associated with pigeon droppings: histoplasmosis, cryptococcosis, and psittacosis. Hantavirus Pulmonary Syndrome (HPS), a rodent-related infection, is a potentially deadly respiratory illness caused by certain types of Hantaviruses, which are viruses found in the saliva, urine, and droppings of some rodents.

When large quantities of droppings are present, stop work and have the site evaluated. Have the droppings removed and disposed of by a professional before continuing work.

4.2.3 Bloodborne Pathogens

Treat all human blood and body fluids as if they are infected. Blood and body fluids can be present on surfaces where an injury occurred, discarded clothing, or drug paraphernalia such as needles and glass pipes. Take the

following precautions when assisting someone when there is the potential to come into contact with bodily fluids or if impacted materials are present on site:

- > Cover cuts, rashes, and broken skin.
- > Wash your hands and exposed skin with soap and water or an alcohol-based disinfectant hand rub immediately after exposure to infectious fluids.
- > Use a disinfectant solution to clean and decontaminate any area where fluids have spilled.
- > Avoid splashes and spills of body fluids.
- > Use a pocket mask or other protective device if performing CPR.
- > Do not handle soiled clothing or drug paraphernalia found on site, exclude the location the item was found from the work area, and notify the property owner of its presence. In no cases should the employee handle and dispose.

4.3 Assured Grounding Program

At no time is an employee of Stantec or a subcontractor of Stantec to jeopardize themselves or other site workers by using electrical equipment without being tested for ground faults prior to being used. All 120-volt, alternating current, single-phase, 15- and 20-ampere receptacle outlets will have approved ground-fault circuit interrupters (GFCI) for personnel protection. Receptacles on a two-wire, single-phase portable, or vehicle-mounted generator rated not more than 5 kilowatts (kW), where the circuit conductors of the generator are insulated from the generator frame and all their grounded surfaces, will also require ground-fault circuit interruption protection.

This Assured Equipment Grounding Conductor Program (AEGCP) will be used in conjunction with GFCIs for ground-fault protection. The following minimum requirements apply:

- > The Site Supervisor and whomever will be operating the electrical equipment must conduct an inspection of the equipment prior to each use.
- > The inspection will cover all cord sets, attachment caps, plugs, receptacles, and any equipment connected by a cord and/or plug. If any external damage (e.g., deformed or missing pins, damaged insulation) or internal damage is found, take the equipment out of use until it is repaired.

4.4 Chemical Descriptions/Exposure

This section describes the prevalent chemical compounds found in total petroleum hydrocarbons, benzene, ethylbenzene, total xylenes, and lead. It provides the chemical name, a physical description, fire or explosion hazards, incompatible materials, common exposure symptoms, target organs affected, and routes of exposure. Refer to the safety data sheets (SDS) in Appendix E for more information on select chemicals. Exposure limits for anticipated chemicals are summarized in Table 1.

Table 1 Exposure Limits of Anticipated Chemicals

Chemical	PEL ^A	TWA ^A	STEL ^A	OEL ^A TWA	OEL ^A STEL
Benzene ¹ [skin] & [carc]	1	0.1	1	---	---
Ethanol [skin]	1,000	1,000	---	---	---
Ethylbenzene [skin]	100	100	125	434 ^B	---
Gasoline ²	300	300	500	100	200
Hydrogen Sulfide	20	10	15	5	10
Methyl Tertiary Butyl Ether [carc]	10	10	15	---	---
Naphthalene	40	40	---	52 ^B	---
Tetraethyl lead [skin]	0.075 ^B	0.075 ^B	---	---	---
Toluene [skin]	50	100	150	75 ^B	---
Xylene (m, o, & p isomers) [skin]	100	100	150	---	---

OEL = Occupational exposure limits established by ExxonMobil issuance: 7/13/2012

PEL = Permissible exposure limit: 8-hour, time-weighted average (Occupational Safety and Health Administration [OSHA])

STEL = Short-term exposure limit: time-weighted average (ACGIH)

TWA = Time-weighted average: 8 hour, [same as TLV], American Conference of Governmental Industrial Hygienists [ACGIH]

[carc]	=	Substance identified as a suspected or confirmed carcinogen
[skin]	=	Substance may be absorbed through the skin, the mucous membranes, or the eyes.
1	=	Federal OSHA benzene limits given for PEL and STEL; STEL has a 50-minute duration limit
2	=	Federal OSHA gasoline limit given for PEL; STEL is the same for FED-OSHA and ACGIH
---	=	No exposure limits published for the listed chemical
A	=	All chemical concentrations are in parts of gas or vapor per million parts air (ppmv) unless otherwise noted
B	=	Milligrams of substance per cubic meter of air (mg/m ³)
C	=	Measured as fiber per cubic centimeter of air

Brief descriptions of the physical characteristics, incompatibilities, toxic effects, routes of entry, and target organs (Sections 4.4.1 through 4.4.13) were summarized from the *NIOSH Pocket Guide to Chemical Hazards*. This information is used in safety and orientation meeting to alert personnel to the hazards associated with expected contaminants.

4.4.1 Benzene

Benzene is a colorless aromatic liquid that may create an explosion hazard. Benzene is incompatible with strong oxidizers, chlorine, and bromine with iron. Benzene is irritating to the eyes, nose, and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression, or abdominal pain. Routes of entry include inhalation, absorption, ingestion, and skin or eye contact. The target organs are the blood, central nervous system (CNS), skin, bone marrow, eyes, and respiratory system. Benzene is carcinogenic.

4.4.2 Ethylbenzene

Ethylbenzene is a colorless aromatic liquid that may create an explosion hazard. It is incompatible with strong oxidizers. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis, or coma. Routes of entry include inhalation, ingestion, and skin or eye contact. The target organs are the eyes, upper respiratory system, skin, and CNS.

4.4.3 Toluene

Toluene is a colorless aromatic liquid that may create an explosion hazard. Toluene is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dermatitis, or photophobia. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, liver, kidneys, and skin.

4.4.4 Xylene Isomers

Xylene is a colorless aromatic liquid that may create an explosion hazard. Xylene is incompatible with strong oxidizers. Xylene is irritating to the eyes, nose, and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain, or dermatitis. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, eyes, gastrointestinal tract, blood, liver, kidneys, and skin.

4.4.5 Naphthalene

Naphthalene is a colorless to brown solid with an odor of mothballs. Naphthalene is a flammable solid, which is highly reactive with oxidizing agents. It is very hazardous in case of ingestion. It is hazardous in eye contact, inhalation, and skin contact as an irritant. It is toxic to the blood, kidneys, CNS, liver, mucous membranes, gastrointestinal tract, and upper respiratory tract. Routes of entry are dermal contact, eye contact, inhalation, and ingestion. Naphthalene is a carcinogen.

4.4.6 Ethanol

Ethanol is a colorless liquid with a pleasant alcoholic odor detectable at 49 to 716 parts per million by volume (ppmv). Ethanol is an extremely flammable liquid and vapor. In vapor form, it can flash fire. It is stable under normal ambient conditions. Avoid mixing with strong oxidizing agents. Ethanol is an eye irritant, and contact may cause stinging, watering, redness, and/or swelling. Skin contact may cause redness, itching, burning, and skin damage. There is low to moderate exposure of toxicity through inhalation and ingestion. Effects of overexposure

may include irritation of the nose and throat, irritation of the digestive tract, nausea, vomiting, flushing, transient excitement followed by signs of nervous depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation, and fatigue), blurred vision, drunkenness, stupor, tremors, respiratory failure, unconsciousness, convulsions, and death. Target organs are the CNS, stomach, liver, male reproductive system, and heart.

4.4.7 Tetraethyl lead

Tetraethyl lead is a colorless liquid or is dyed red, orange, or blue with a slight musty odor. It is a class two flammable combustible liquid. Vapors may travel back to source and flash back. It is not compatible with oxidizing agents and class three reactive materials, and it may explode in a fire. Symptoms of exposure are irritation to the eyes, with possible loss of vision, and irritation to the nose and throat, causing coughing and wheezing. High exposure can cause headaches, irritability, reduced memory, disturbed sleep, tiredness, personality changes, convulsions, and death. Repeated exposure can lead to lead poisoning. Target organs are the blood cells, brain, and kidneys. Routes of exposure are inhalation, dermal contact, and ingestion.

4.4.8 Hydrogen Sulfide

Hydrogen sulfide (H₂S) is a gas that is irritating to the eyes, mucous membranes, and respiratory system. Inhaled gas inhibits cellular respiration resulting in pulmonary paralysis, sudden collapse, and death. At concentrations of 4 percent (%) up to 44% are the lower explosive limit (LEL) and upper explosive limit (UEL) making H₂S extremely flammable. Continuous exposure to low (15 to 50 ppmv) concentrations will generally cause irritation to mucous membranes, and may also cause headache, dizziness, or nausea. Higher concentrations (200 to 300 ppmv) may result in respiratory arrest leading to coma or unconsciousness. Exposures for more than 30 minutes at concentrations greater than 700 ppmv have been fatal. Continuous inhalation of low concentrations may cause olfactory fatigue or paralysis of the sense of smell. Thus, detection of hydrogen sulfide by its odor is not effective.

4.5 Chemical Use and Storage

Pursuant to the hazard communication standard, chemicals being brought on site by Stantec employees or subcontractors must be evaluated for safe use, handling, and storage requirements. Each chemical must have an accompanying SDS. Each SDS shall be reviewed for PPE, correct application, handling, storage, and spill response requirements prior to any chemical(s) being used. For questions and concerns on chemicals being brought on site, contact your HSSE Representative. The SDS information is located in Appendix E for site contaminants and company-purchased chemicals. The SDS information for subcontractor chemicals shall be managed by the subcontractor and available on site.

If secondary containers are used for holding the chemical on site, the container will be compatible with the material and have the following warning chemical information on the label: chemical name, all its physical hazards and health hazards; and PPE requirements in alignment with Stantec's HMIS (hazardous materials identification system) labeling policy.

4.6 Fall Protection

All employees who use ladders (fixed or extension) or work from elevated platforms where the distance to the next level below is greater than 6 feet will implement fall protection and safe work practices described in the following subsections. Fall protection should also be used when:

- > Working above 6 feet without guardrails.
- > Working over water.
- > Working less than 6 feet from an unguarded edge.
- > Working on a roof with a grade more than 20% or less if slippery.
- > Climbing a ladder above 20 feet.

4.6.1 Ladder Safety

Use of ladders where the operator is higher than 6 feet and working from the ladder will require fall restraint or fall arrest system PPE to be utilized.

- > All ladders will be inspected before use, any damage or missing slip resistant shoes, lose or missing rungs, for A frame ladders damaged or missing locks will render the ladder inoperable and be tagged and removed from service.
- > Metal/conductive ladders will not be used around electrical work or overhead lines.
- > Manufacturer information must be legible and followed in order to use the ladder.
- > Extension ladders must maintain the 4:1 ratio, must extend 3 feet above elevated surface and be tied off or secured by a second person.
- > A frame warning must be followed and not work above manufacturer recommendations.
- > A frame ladders must be completely extended and locked out before use.
- > All ladders must be set on firm surfaces, clear of obstructions, and not on slick surfaces.
- > Weight limits of ladders must be followed and to include any tools or materials being carried.
- > Three points of contact (two hands with one leg or one hand with two legs) must be maintained at all times when climbing up or down the ladder.
- > Ladder must be faced at all times.

4.6.2 Elevated Platforms

Elevated platforms for the purposes of this HASP will include work on scaffolds, aerial lifts, man baskets, powered industrial trucks, roofs, ladder jacks, raised platforms, unprotected edges, and openings in floors where workers will be able to fall a distance of 6 feet or greater or a fall into/onto a hazardous location such as a vat, tank, or mechanical operation.

- > All workers who will be working where a fall is equal or greater than 6 feet will be trained on how to work on that surface safely (i.e., trained operator of scissor or aerial lifts).
- > All workers are required to use, to know how to use, and inspect personal fall arrest and/or restraint systems, except where the lift is not designed or required for using a restraint system.
- > Fall protection systems must be used in accordance with manufacture and/or regulatory requirements (e.g., guard rail, safety nets, personal fall arrest, personal fall restraint, and positioning device systems).
- > Fall arrest and restraint systems will be anchored to support 5,000 pounds (lbs) and 3,000 lbs per worker, respectively.
- > A competent person must install, build, or operate any equipment or structure where workers are at risk of falling. Proof of competency must be provided before work begins in accordance with Federal and State OSHA standards. Typical proof is a wallet card stating worker met the training requirements for that specific area of expertise.

5 General Project Safety Requirements

Project activities will be conducted in accordance with the following minimum safety requirements:

- > Eating, drinking, and smoking will be restricted to a designated area.
- > Jewelry shall be removed or appropriately secured to prevent being caught in rotating equipment or snagged on a fixed object (e.g., wrist watches, bracelets, rings, chains, necklaces, and open earrings).
- > Do not wear loose clothing.
- > Shoulder length hair or longer should be tied back.
- > All personnel will be required to wash their hands and faces before eating, drinking, smoking, or applying cosmetics in the aforementioned designated areas.
- > Gross decontamination and removal of all PPE will be performed before leaving the exclusion zone. Contaminated clothing will be removed and collected in a drum for disposal.
- > Shaking or blowing dust or other materials off potentially contaminated clothing or equipment to remove dust or other materials is not permitted.

- > The Site Supervisor will be responsible for taking steps to protect employees from physical hazards including:
 - Falling objects, such as tools or equipment
 - Falls from elevations
 - Tripping over hoses, pipes, tools, or equipment
 - Slipping on wet or oily surfaces
 - Insufficient or faulty PPE
 - Insufficient or faulty equipment or tools
- > Field personnel will be cautioned to inform each other of the non-visual effects of the presence of atmospheric contaminants, symptoms of exposure can include the following:
 - Headaches
 - Dizziness
 - Nausea
 - Blurred vision
 - Cramps
 - Irritation of eyes, skin, or respiratory tract
 - Changes in complexion or skin discoloration
 - Changes in apparent motor coordination
 - Changes in personality or demeanor
 - Excessive salivation or changes in pupillary response
 - Changes in speech ability or pattern

6 Protective Equipment Requirements

The PPE mentioned in this HASP is meant to protect employees from the general construction hazards as well as the chemical exposure hazards described in Section 4. Respiratory protection is covered in Section 7, while inspection, donning, and doffing procedures for gloves and Tyvek™ are included in Appendix F.

All PPE shall be maintained and stored in a clean environment. Where the shape of the PPE is critical for use, a hard container shall be used for storage to maintain integrity. No defective or heavily soiled PPE shall be worn while performing work. In the event that PPE becomes torn or damaged during use, it will be replaced immediately upon exiting the exclusion zone and after any required decontamination is completed, as described in Section 11.

Field personnel, subcontractors, and visitors are required to wear the following protective clothing and equipment as a minimum **while in the work area at the job site**:

- > Hard hat protection meeting ANSI Z89.1.
- > Class II ANSI Rated 107-2004 Traffic safety vest or comparable long-sleeved shirt or jacket.
- > Safety glasses meeting ANSI Z87.1.
- > Safety goggles meeting ANSI Z87.1 (when working with liquids).
- > Safety-shoe footwear, meeting ASTM F-2413. Shoes must be rated I75, C75, EH, and PR.
- > Long sleeves or coveralls worn to protect arms.
- > Hearing protection (as required in Section 8).

Note: 1 – ANSI is the American National Standards Institute
2 – ASTM formerly known as the American Society for Testing and Materials

Field personnel **engaged** in work are required to wear the following equipment:

- > Hard hat protection meeting ANSI Z89.1.*
- > High visibility safety vest/clothing (Class II or Class III ANSI rate vest, Standard 107-2004**).
- > Safety glasses meeting ANSI Z87.1.
- > Safety goggles meeting ANSI Z87.1 (when working with liquids).

- > Safety-shoe footwear, meeting ASTM F-2413. Shoes must be rated I75, C75, EH, and PR. Construction and demolition workers must also have Mt75.
- > Standard Tyvek™ coveralls (when potential for impacted soil, water, or dust hazard exists or when mandated by the Site Supervisor).
- > Respirator with P-100 and organic vapor cartridges (if lowest PEL or TLV is exceeded in the breathing zone or the Site Supervisor decides respirators should be worn).
- > Hearing protection (as required in Section 8).
- > Hand protection as based on task-specific JLA (Appendix C). At a minimum, level three cut resistant and puncture resistant gloves for all site activities, consideration of impact and chemical resistant properties or layers to address additional hazards.
- > Long sleeves or coveralls worn to protect arms.
- > Temperature variations are to be considered when wearing PPE. Appendix G “Heat Stress Protocol” and Appendix H “Cold Stress Protocol” shall be reviewed prior beginning work to establish warning signs of exposure and adequacy/hazards of protection.
- > Other PPE as specified in the JLA based upon site and task-specific evaluation of potential hazards.

If site-specific conditions warrant, and with program manager prior approval, the minimum PPE requirements may be modified. Once program manager approves, document changes on any applicable JLAs.

*SSW must wear orange colored hard hat to readily identify them to other workers or clients at the work site.

**Class II reflective clothing is to be worn where employees are exposed to vehicle traffic up to 50 miles per hour (mph). Class III reflective clothing is to be worn when employees are exposed to traffic speeds in excess of 50 mph. Safety vests must be tear-away types when working near rotating equipment (i.e., hollow-stem auger drilling).

7 Respiratory Protection Program

This section summarizes the Stantec Respiratory Protection Program. Stantec subcontractors must have company medical surveillance and respiratory protection programs including adequate training of their employees. Subcontractors must provide PPE as required in this HASP for their employees. Stantec will attempt to verify worker training but does not assume the responsibility of the employer. Sections 7.1 through 7.4 outline Stantec’s Respiratory Protection Program.

The HSSE Representative will explain Stantec’s Respiratory Protection Program to each new employee who must wear a respirator. The employee will be asked whether he or she understands the information provided. If the company physician has issued a written approval to Stantec for the employee and the HSSE Representative has checked the fit of the respirator, the employee may then be issued a respirator. A written record is signed and dated by the employee and HSSE Representative and kept in the new employee’s safety training records file. Topics required during training includes:

- > Applicable OSHA regulations 1910.134 and 1910.120 and relevant state regulations.
- > Nature of respiratory hazards to be encountered in the work environment and how to select proper respiratory equipment.
- > Use of respirators and proper fitting.
- > Functions and limitations of respirators.
- > Cleaning, disinfection, inspection, maintenance, and storage of respirators.

Respirators are the last line of defense in providing a healthy and safe work environment. Prior to donning a respirator, employees are to consider the availability of engineering and administrative controls. Can equipment or materials be used to reduce or limit the concentration of chemicals present where respirator use is not required? Examples of engineering controls are large industrial fans to remove the vapors from the immediate work area, or use of water or amended water to control vapor emissions. Administrative controls which can be implemented are limiting the amount of time chemicals are available for exposure, e.g., drumming or covering source materials to limit exposure.

7.1 Functions and Limitations of Respirators

Respirators are not intended for and may not be used in atmospheres that are, or may become, immediately dangerous to life or health (IDLH) or in atmospheres where the identity or concentration of the chemical(s) [vapors, mists, fumes, dusts, or particulates] is unknown. Respirators may not be used in atmospheres containing less than 19.5% oxygen.

Cartridges or canisters for respirators are selected and supplied to employees by the HSSE Representative. The failure to choose or use a respirator equipped with cartridges or filters suitable for the chemicals(s) in the atmosphere or likely to be released in the atmosphere may result in the respirator providing little or no protection against the contaminated atmosphere. The HASP specifies the chemicals(s) to be encountered and the type of cartridge or canister appropriate for personal protection.

Assuming that the respirator is properly fitted, in good condition, free from leaks, and has the proper cartridges for the contaminant(s) present, the length of time the respirator will provide protection also depends on the conditions of use.

The conditions of use include, but are not limited to, the following:

- > The concentration of chemical(s) in the atmosphere.
- > The temperature and humidity of the ambient atmosphere.
- > Any previous use of the cartridges and filters.
- > The elapsed time since the removal of the cartridges or filters from their protective packaging.
- > The emotional state of the wearer.
- > The level of physical activity of the wearer.

Cartridges designed and specified to protect the wearer against airborne particles are not appropriate for protection against gases and vapors. Cartridges designed and specified for protection against specific gases and vapors are not appropriate for protection against airborne particles or other gases or vapors beyond the scope of that type of cartridge. If the label is missing or the type of cartridge is inappropriate, the cartridge may not be used under any circumstances; it will provide little or no protection to the wearer.

Cartridge schedule for petroleum-related hydrocarbons require a single shift change out, unless breakthrough indicators require an earlier change out. Do not reuse cartridges after the packaging is removed or the cartridge has been used for respiratory protection. Reuse of cartridges can cause exposure since petroleum hydrocarbons will desorb off the respirator if left overnight. Respirator breakthrough times are shown on Table 2 for constituents of concern.

Table 2 Respirator Breakthrough Times (minutes)

Name	Constituent Concentration (parts per million by volume [ppmv])				
	50	100	200	500	1,000
Benzene	Work Shift	Limited to a maximum concentration of 50 ppm for negative pressure APR			
		See the OSHA Benzene Standard - 29 CFR 1910.1028(g)			
Toluene	1,018	562	307	135	72
Ethylbenzene	1,133	604	319	135	70
m-Xylene	1,143	608	321	136	70
Ethanol	123	105	85	60	43
1,2-Dichloroethane	482	310	194	101	60

1. Cartridge use rates we based on normal breathing rates, increase in activity such as heavy lifting or shoveling will reduce the life span of the cartridge. Be prepared for more frequent cartridge change outs (two per shift).
2. Humidity will reduce the lifespan of the cartridge; decrease the time allotment by a factor of 2 when humidity exceeds 65%.
3. 480 minutes equals an eight-hour work shift time frame.
4. **Work Shift** indicates that the service life for this constituent is limited to a single work shift by the OSHA Standard.

7.2 Danger Signals Indicating Possible Respirator Failure

If any of the danger signals in the following list are experienced while wearing a respirator, immediately return to a fresh air environment. The cartridges or filters may be inappropriate or used up, or abnormal conditions may be creating vapor concentrations which are beyond the limits of the cartridges or filters. Danger is indicated when the individual subject to exposure:

- > Smells or tastes chemicals or if eyes, nose, or throat become irritated.
- > Has difficulty breathing.
- > Notices that the breathing air becomes uncomfortably warm.
- > Experiences headaches, dizziness, cramps, nausea, or blurred vision.
- > Experiences changes in complexion or skin discoloration.
- > Experiences changes in motor coordination, personality, or demeanor.
- > Experiences changes in speech ability or pattern.
- > Experiences excessive salivation or changes in pupillary response.

7.3 Positive and Negative Respirator Pressure Seal Checks

Qualitative seal check testing of each respirator must be conducted before the respirator may be used to ensure a good fit is obtained. The following steps should be taken in qualitative seal checks of the respirator:

- > Don the face piece with cartridge or filters in place. Pull straps together equally to avoid distorting the mask.
- > Adjust the face piece. Do not over-tighten it.
- > Negative pressure seal check: Close off both inlet connections with palms of hands, inhale slowly, and hold breath momentarily. No leakage should be detected, and the face piece should be drawn slightly to the face.
- > Positive pressure seal check: Close opening in the exhalation valve guard by placing palm of one hand over face of guard; exhale slowly maintaining slight positive pressure. No leakage should be detected between the face seal and the face.
- > Should any leakage be noted:
 - Adjust the head straps and face piece slightly; recheck for leakage.
 - Check condition of exhalation valve and seat. Check that both inlet gaskets are present and in proper condition.
 - In the event the face piece cannot be adjusted so there is no leakage, **do not enter the area requiring protection**. Due to each individual's facial features, a different style or size face piece may be required to obtain a proper facial fit.
- > Perform positive and negative respirator seal checks throughout the day and increase frequency of checks when employee is sweating or when hot/humid conditions exist.

Note: Failure to perform qualitative seal checks of the respirator each time the respirator is donned may result in little or no respiratory protection.

7.4 Inspection, Cleaning, and Storage

The respirator should be inspected, cleaned, and properly stored after use each day. The steps listed in Sections 7.4.1 through 7.4.3 are the basic elements of each procedure.

7.4.1 Inspection

To inspect a respirator:

- > Examine face seal for rips, tears, holes, deformation, or stiffness.
- > Examine face piece plastic center shell for cracks, missing components, or damaged threads.
- > Examine harness for breaks, cuts, frays, tears, and missing or damaged hardware.
- > Examine inhalation and exhalation valves and valve seats for cuts, cracks, or foreign matter which may not allow the valve to close completely. Check that valves are properly installed and are not distorted.
- > Examine cartridges for signs of abuse or damage. Discard damaged items.

Any respirator malfunction or deficiencies noted must be reported to the HSSE Representative who will issue a new respirator or correct the deficiencies using only approved spare parts from the manufacturer of the specific

model in need of repair. Spare parts from any other manufacturer may not be used under any conditions. Instructions in the manual provided by the manufacturer should be followed when the respirator needs repairing or replacing.

7.4.2 Cleaning

To clean a respirator:

- > Unthread cartridges or filters.
- > Wash the face piece with warm water and a mild detergent after each use.
- > Disinfect the face piece if it was used by another person. The mask should routinely (once per month) be disinfected even if the respirator is used solely by one individual. A hypochlorite solution may be used (i.e., 2 tablespoons chlorine bleach per gallon of water for an acceptable solution).
- > After cleaning and air-drying, check that the face piece is not damaged and that components removed prior to cleaning have been installed properly.

7.4.3 Storage

To store a respirator:

- > Place the respirator in its storage box in a heat-sealed or re-sealable plastic bag. Store the respirator in a flat position to prevent the face seal from taking a permanent “set.”
- > Replacement components should be stored in sealed packages in a cool, clean, low-humidity location until ready for use.

8 Hearing Conservation Program

This section summarizes the Stantec Hearing Conservation Program. Stantec employees and subcontractors must have hearing protection available on site for working conditions that can result in hearing damage. Due to the changing working environment, engineering controls are typically not applicable to mitigate noise in the field environment; therefore, hearing protection such as plugs, canal blocks, or muffs are employed. Subcontractors must provide PPE as required in this HASP for their employees. Stantec will attempt to verify worker training but does not assume the responsibility of the employer. Stantec’s HSSE Representative will conduct the required training, including these basic topics:

- > Applicable OSHA regulation 1910.95 and relevant State regulations.
- > Audiometric testing program (initial and annually/biannually thereafter).
- > Training on the use of hearing conservation devices and their limitations.
- > Nature of noise hazards to be encountered in the work environment.
- > Length of time noise exposure can occur which will result in hearing damage.

Anytime during work when the decibel (dB) noise level exceeds 85 over a TWA of 8 hours requires implementation of Stantec’s Hearing Conservation Program. For noise measurements greater than 85 dB, the exposure periods are shown on Table 3.

Table 3 Noise Exposure Periods for Measurements Greater Than 85 dB

Daily Duration (Hours)	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110

Daily Duration (Hours)	Sound Level dBA Slow Response
¼ or less	115
None acceptable	>140

Table provided from 29 CFR 1910.95, Table G-16

Hearing protection devices are not created equal. Each manufacturer establishes a noise reduction rating (NRR) for their product. The NRR is established by evaluating hearing protectors under laboratory conditions specified by the American National Standards Institute in ANSI S3.19-1974. OSHA's experience and the published scientific literature indicate that laboratory-obtained real ear attenuation for hearing protectors can seldom be achieved in the workplace. Based on the type of noise exposure anticipated (see Appendix I for typical noise ratings on commonly used powered hand tools and heavy equipment), use the following equations to determine if the hearing protection is adequate.

A common method used for **single protection** (either muffs or plugs) is as follows:

- > Determine the laboratory-based noise attenuation provided by the hearing protection device (HPD). This is the NRR and is listed on the packaging.
- > Subtract seven from the NRR to account for spectral uncertainty divide that number by two and subtract that number from the A-weighted TWA workplace noise level, as follows:

$$\text{Estimated Exposure (dBA)} = \text{TWA (dBC)} - [(NRR-7)/2]$$

For **double protection** (earmuffs and plugs are used simultaneously) use the following:

- > Determine the laboratory-based NRR for the **higher** rated protector (NRR).
- > Subtract 7 dB from NRR if using A-weighted sound level data.
- > Add 5 dB to the field-adjusted NRR to account for the use of the second hearing protector.
- > Subtract the remainder from the TWA as follows:

$$\text{Estimated Exposure (dBA)} = \text{TWA (dBA)} - [(NRRh- 7) + 5]$$

If the reduction level is protective of hearing (less than 90 dB for an 8-hour work day), move forward with the work. Appendix I includes typical noise levels for powered hand tools and heavy equipment. Use this Appendix in establishing hearing protection levels if noise documentation is not available on site or has not been determined. In the event that the noise reduction does not provide adequate hearing protection, contact the Project Manager and do not proceed with the work.

It is the responsibility of subcontractors using heavy equipment to provide the dBA noise level measurements for their equipment.

9 Work Zones and Security Measures

This section describes the work zone requirements for keeping the public and employees safe by identifying where the exclusion zone exists. Security measures for the protection of workers on site; and for client, Stantec, and subcontractor materials, equipment, and structures; are described in Section 9.1.

9.1 Work Zones

9.1.1 Work Zone Demarcation

Effective barriers must be used to separate people from equipment. Natural barriers (heavily forested area, shoreline, drainage ditch) may be used if they will effectively prevent individuals from accessing the work zone/Red Zone.




Tables 4 and 5 identify the suitable barriers that must be used when demarcating the **Red**, **Orange**, and **Green Zones**. Zones are defined in Sections 9.1.3 through 9.1.5.

Table 4 Work Zone Demarcation - No Perimeter Fence Present

No Perimeter Fence Present	Demolition	Construction & Excavation	Cranes/Lifting	Drilling	M & R
Construction Panels/Hoarding	✓	✓	✓	✓	✓
Fence and-or mesh panels -6' to 8'	✓	✓	✓	✓	✓
Fence and/or mesh panels - 4'	X	✓	✓	✓	✓
Barricades	X	+	✓	✓	✓
Jersey Barricades	X	+	✓	✓	✓
Safety Snow Fencing	X	+	✓	✓	✓
Collapsible Barriers	X	X	✓	✓	✓
Delineators/Cones and Tape	X	X	+	✓	✓
Cones	X	X	X	+	X

Table 5 Work Zone Demarcation - Perimeter Fence Present

Perimeter Fence Present	Demolition	Construction & Excavation	Cranes/Lifting	Drilling	M & R
Construction Panels/Hoarding	✓	✓	✓	✓	✓
Fence and-or mesh panels -6' to 8'	✓	✓	✓	✓	✓
Fence and/or mesh panels - 4'	X	✓	✓	✓	✓
Barricades	X	✓	✓	✓	✓
Jersey Barricades	X	✓	✓	✓	✓
Safety Snow Fencing	X	✓	✓	✓	✓
Collapsible Barriers	X	+	✓	✓	✓
Delineators/Cones and Tape	X	+	+	✓	✓
Cones	X	+	+	+	✓
No Demarcation	X	X	X	X	✓

-  Suitable demarcation
-  Lower risk and / or short duration (less than 12 hrs., remote location, low traffic isolated site)
-  Not suitable

9.1.2 Traffic Control

A traffic control plan should be developed to manage the safe movement of vehicles and pedestrians through the work zone/site. Traffic control plans must include the location of the work, appropriate buffers, traffic flow, parking areas, existing structures, and required traffic control devices.

Work zones will be established based on traffic control figures created for the site work shown on traffic control plan (Figure 1).

9.1.3 Green Zone

Green Zone (No Work Zone) – Used to address personnel needs, for example a rest area or meeting area.

9.1.4 Orange Zone

Orange Zone (General Work Zone) – General site work zone requiring PPE.

9.1.5 Red Zone

Area where personnel that are non-essential to the Red Zone activity are prohibited while heavy equipment is operating. This includes the Drop Zone, Fall Zone, Predicted Debris Area, Swing Zone, and Tip Zone.

9.1.5.1 Drilling Red Zone

Also known as the Exclusion Zone – Specific geographic area of a facility or site where non-essential personnel and equipment are prohibited while drilling equipment is being operated.

9.1.5.2 Drilling Operations Exclusion Zone

Area that identifies a safe distance for personnel away from drill hole (3 feet or 1 meter) when equipment is operating. Required when cages or interlocks are not in place.

9.1.5.3 Heavy Equipment Red Zone

Specific geographic area of a facility or site where personnel that are not essential to the Red Zone activity and equipment are prohibited while heavy equipment is being operated or demolition activities are being completed. This includes the Buffer Area, Designed Drop, Fall Zone, Plan Area, Predicted Debris Area, Swing Zone, and Tip Zone.

Certain activities may require a spotter, watchperson, or tagman to be in the Red Zone and possibly even the swing zone when the equipment is moving. In these instances, approval is required by the ExxonMobil Area Manager with mitigating action implemented.

9.1.6 General Work Exclusion Zone

Cones, high-visibility fencing, delineators with caution tape, barricades, or a suitable alternative will be used to deny public access to the exclusion zone or the area where work is being performed. Cones and warning signs will also be used to define an exclusion zone which redirects motorists and pedestrians away from the work area. The general public will not be allowed to be close to the work area under any conditions. If for any reason the safety of a member of the public (e.g., motorist or pedestrian) may be endangered, work will cease until the situation is remedied.

For sites where public or workers need to be informed of possible hazards, the site will be posted with any applicable signs. For example:

- > Hard hat required
- > No Smoking
- > Prop 65 (California only)
- > OSHA Construction Bill of Rights Notice
- > Hearing Protection Required
- > Authorized Personnel Only

9.1.7 Drilling Exclusion Zones

The Drilling Exclusion Zone is the area that environmental drilling activities occur, including air knifing, air vacuuming, hydro vacuuming, hand augering, and mechanized drilling equipment.

- > Use site layout plan and traffic control plan to control personnel, vehicle, and equipment movement around the site.
- > If working near overhead power lines, a sign warning of the hazard(s) must be placed 23 feet (7 meters) on each side of the power line.
- > Establish a Drilling Red Zone to keep non-essential personnel clear of the work area. The Red Zone should include the Tip Zone.
- > A designated person must be assigned to control access to the Red Zone.
- > Only essential machines and personnel are permitted.
- > If cages or interlocks are not in place around rotating equipment, a Drill Operations Exclusion Zone must be marked on the ground (e.g., spray paint) to identify a safe distance for personnel away from borehole (3 feet or 1 meter) when equipment is operating.
- > Equipment must be stopped with a show of hands by the driller for personnel to enter the Drill Operations Exclusion Zone.

9.1.8 Working Near Moving Equipment – Heavy Equipment Exclusion Zones

Field operations that require the use of heavy equipment (excavators, backhoes, graders, steamrollers, cranes, personnel lifts, etc.) shall comply with the following operational conditions:

- > Develop and implement a site layout plan that identifies the spotter location, equipment (including clearance distance), staging locations, intended equipment travel paths (with speed limits), and emergency escape route.
- > Establish a Red Zone to keep non-essential personnel clear of the work area of heavy equipment. The Red Zone must be:
 - Greater than the swing zone of any moving part on the heavy equipment.
 - Greater than the tip zone of the heavy equipment.
 - Greater than the fall zone of equipment and their contents.
 - Greater than the distance that debris/projectiles may travel during demolition activities.
 - Greater than the footprint of the structure to be demolished.
 - Greater than the designed drop (for demolition) area (1.5 x the structure height).
- > A designated spotter must be assigned to control access to the Red Zone (cannot be conducting other tasks).
 - Controls entry/exit of exclusion zone – Prevents personnel from entering the Red Zone while equipment is moving or operating.
 - Ensures no part of the equipment or load enters the minimum clearance area above, below, and/or on either side of an energized electrical line(s) or other structures.
 - Maintains communication with the operator by using a standard set of signals (hand, verbal, or radio communication). Signals must be developed, documented, and always used (no cell phones allowed in the exclusion zone).
- > If the spotter must be in the Red Zone, they must be in a designated area with a physical barrier (vehicle, elevated platform, etc.) If the spotter must enter the swing zone, the operator will be notified and must shutoff the equipment with the boom/arm on the ground (with a show of hands).
- > Personnel entering the Red Zone shall only do so with approval from the spotter.
- > Setback distance minimum requirements are 2 feet (0.6 meter) for personnel and soil, and 5 feet (1.5 meters) for support equipment.

9.1.9 Working Near Overhead Electrical Lines

When working near overhead electrical lines, the power should be de-energized whenever possible.

- > Equipment with booms, lifts, rigging, excavator arms, etc., are set up a minimum clearance of the full height of the equipment plus the distance noted in the Table 6.
- > Line voltage is confirmed to determine safe approach distances (contact owner/operator of electrical line to confirm). Use the greater of:
 - The determined safe approach distance OR
 - The full height of the equipment plus 23 feet (7 meters)

Table 6 Minimum Clearance between Operating Heavy Equipment and Overhead Electrical Lines

Voltage (kv)	Distance Between Line and any Part of Heavy Equipment	
Up to and including 50	10 feet	3.1 meters
Over 50 to 200	15 feet	4.6 meters
Over 200 to 350	20 feet	6.1 meters
Over 350 to 500	25 feet	7.6 meters
Over 500 to 750	35 feet	10.7 meters
Over 750 to 1,000	45 feet	13.7 meters
Over 1,000	As established by the operator of line or registered professional engineer who is a Qualified Person	

When working or traveling within 23 feet (7 meters) of a power line, a spotter must be used to direct movement of any equipment, be clearly visible to the equipment operator, and have a warning device, i.e., air horn, to alert workers of encroachment on the prohibited area. Equipment with booms, lifts, rigging, excavator arms, masts, etc., must be fully lowered to the maximum extent prior to transit. Minimum clearance distances for heavy equipment in transit are shown in Table 7.

Table 7 Minimum Clearance between Heavy Equipment in Transit and Overhead Electrical Lines

Voltage (kv)	Distance Between Line and any Part of Heavy Equipment	
Up to and including 75	4 feet	1.2 meters
Over 0.75 to 50	6 feet	1.8 meters
Over 50 to 345	10 feet	3.1 meters
Over 345 to 750	16 feet	4.9 meters
Over 750 to 1,000	20 feet	6.1 meters
Over 1,000	As established by the operator of line or registered professional engineer who is a Qualified Person	

9.2 Security

Security is an important component of completing field work safely. The security requirements shall identify and address measures to be taken for the site, equipment, personnel safety, and lone workers Site security measures require employees to be aware of their surroundings at all times.

9.2.1 Site Security

This site does not require the use of additional personnel or private security. At least two workers and lighting will be required for any night work unless prior approval is received from the program manager.

Managing equipment on site while working requires employees and subcontractors to keep tools and equipment secured when not being used. This includes locking vehicle and truck doors and truck utility beds.

9.2.2 Personal Security

Personal security is of paramount importance. In any event where a third party threatens personnel for money or assets, personnel should not refuse, but instead provide them with the requested items. Tools, trucks, and money can be replaced. Human life cannot. If the third party attacks, personnel should defend themselves and try to get away. Do not leave the site with an assailant. If the work crew is approached by undocumented immigrants, the work crew shall not engage, shall promptly notify law enforcement or local security, and shall leave the area if deemed a threat.

The project manager has conducted a risk assessment for this site work and has addressed the risk issue(s). If required one or more of the following security strategies will be implemented This site does not require the use of additional personnel or private security. At least two workers and lighting will be required for any night work unless prior approval is received from the program manager. Site security does not require additional personal or private (armed or unarmed) security to conduct the work described in this HASP. Work will not take place at night; therefore, security fencing or additional lighting is not required. Modification of the work time to begin work in early morning with early afternoon departure will not address personal security concerns.

9.2.3 Lone Worker

Employees who work alone on site are required to comply with Stantec's Lone Worker Policy. This policy requires employee communication during the workday of his or her status to a designated employee that he or she is safe. The requirement is for the employee to communicate every two hours while working alone. If the check-in is missed, the designed point of contact will attempt to contact the employee person. If after ten minutes the employee is not reached and status is not confirmed, the closest employee will be mobilized out to the site to check on the non-responsive worker, or the on-site business will be contacted. An exception to the

two hour requirement is for mobilization and demobilization to and from a site where travel time exceeds two hours. In those cases, notification upon safe arrival is required.

9.2.4 Buddy System

The OSHA HAZWOPER standard defines the buddy system as a way of organizing employees into work groups where each employee of the work group is designated to be observed by at least one other employee in the work group. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency. The tasks being performed under this site-specific health and safety plan does not require a buddy system to be implemented. OSHA has interpreted “emergency” as site conditions where the release or situation must pose an emergency, including high levels of exposure to toxic substances, life or injury threatening conditions, mandatory evacuation, IDLH conditions, fire and explosion hazards (exceeds or has potential to exceed 25% of the LEL), situations requiring immediate attention due to danger, or oxygen deficient conditions. Nuisance spills, minor releases, etc., which do not require immediate attention (due to danger to employees), are not considered emergencies and do not require the use of the buddy system.

Use of a buddy system may be required in other situations and should be evaluated as per Sections 9.2.1 through 9.2.3.

9.2.5 Site Departure

Prior to leaving the site, ensure all fences are locked, equipment is secured, and materials are not left out in the open to provide an easy theft opportunity. Ensure status of site is in compliance with the completed site security evaluation.

9.2.6 Limited or No Cellular Telephone Service

In the event the project site is located in a non-existent cellular service area, Stantec or its subcontractor will provide to the employee or work group a satellite telephone to establish communication with the office for project status and contact of emergency response services. For sites with limited cellular signal strength, the project team will consider installing a cellular booster station to provide active communication with the office and to contact emergency response services.

9.3 Neighboring Property Impact

Site is located mostly on a parking lot but is open to roadway traffic to the East and the South. To the West is a fenced section that has lots of water, moss, and grass on the floor creating a slipping hazard in all times of the year. To the North there is a perimeter fence that has blackberry growing through it which can cause tripping hazards and cut personnel. Potential hazards and mitigation strategies are listed below.

Off-Site Hazard Location Based on Direction (N,S,E,W)	Hazard Identified	Mitigation Action Item (Controls will be identified in site-specific JLA)
E – Open to roadway traffic	Being struck by vehicles	Implement Maintenance of Traffic (MOT) and Traffic Control Best Practices, Traffic Control JLA, wear PPE identified in Section 6, and establish exclusion zones pursuant to Section 9.1
N – Biological hazards	Blackberry is near north fences year-round causing tripping hazards and can prick if not careful.	Site Access JLA – Setup exclusion zone if there is nearby work.

Off-Site Hazard Location Based on Direction (N,S,E,W)	Hazard Identified	Mitigation Action Item (Controls will be identified in site-specific JLA)
W – Moss and high grass covers large area of floor	Moss and grass are slippery and can cause slip hazards and hide biological hazards	Site Access JLA – Use a shovel to move as much of the material as possible creating a safe path to areas that are needed.
S – Open to roadway traffic	Being struck by vehicles	Implement Maintenance of Traffic (MOT) and Traffic Control Best Practices, Traffic Control JLA, wear PPE identified in Section 6, and establish exclusion zones pursuant to Section 9.1

10 Exposure Monitoring

It is not anticipated that project personnel exposure will exceed the TLVs or PELs of the materials; however, in the event that site conditions create the possibility that exposure limits could be exceeded in the working area and breathing zones, Stantec will implement engineering and administrative controls prior to donning respirators. In the event these controls are impractical or ineffective in sufficiently lowering the air contaminant levels, respirators will be used within the established protection factors and oxygen levels. Specific monitoring devices are documented in the work permit process. Exposure monitoring is also required for heat and cold working environments. PPE and biological monitoring will be established for these working conditions.

10.1 Lead

If site conditions indicate the possibility of elevated lead levels, air monitoring will be performed to determine whether personnel are exposed to airborne concentrations above the OSHA Action Level (30 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]) or state action level if lower, for lead. Portable air sampling pumps will be used with 37 millimeter, 0.8 micro (μ) Mixed Cellulose Ester (MCE) filter cassettes. At least one full-shift (seven hour minimum) personal air sample will be taken for each job classification in each work area. Monitoring and analytical techniques will have a confidence limit of 95% of not less than plus or minus 25% for airborne concentrations of lead greater than or equal to $30 \mu\text{g}/\text{m}^3$.

Air samples will be submitted under Chain-of-Custody protocol to an American Industrial Hygiene Association (AIHA) accredited analytical laboratory for analysis. Sample results will be available five days after submittal and will be provided to monitored employees. If results indicate exposure at or above the action level, additional monitoring at least seven days apart will be performed until at least two consecutive measurements are below the action level ($30 \mu\text{g}/\text{m}^3$). Calibration of air sampling pumps certificates will be obtained from the supplier and be on site for inspection. Trip and field blanks will be submitted per frequency established by a certified industrial hygienist.

10.2 Organic Vapors

If site conditions indicate the possibility of elevated organic compound levels, air monitoring will be performed to determine whether personnel are being exposed to airborne concentrations above the PELs listed in Table 1 (Section 4.4). Since identifying specific compounds will be difficult using current organic vapor or photo-ionization detector (PID) technology the cumulative reading will require action if the gasoline PEL is exceeded, except where a specific known chemical or group of chemicals has been identified, then specific analyzers will be used. All air monitoring equipment will show calibration data within manufacturer specifications and the manufacturer's instruction manual will be on site. Calibration gases include 100 ppmv isobutylene and 100 ppmv

hexane. Multi-gas meters will use calibration gases specific to that unit's analyzers and at concentrations that are protective of employee exposure health. Employees are trained to know and understand the response factor of the calibration gas to the monitoring instrument for the chemicals listed in Table 1 to identify when the real-time instrument reading is approaching the exposure limit.

10.3 Possible Explosive Atmospheres

Gasoline has a flammable range from approximately 1.4 to 7.6 percent by volume in air. One percent in air is equivalent to 10,000 ppmv; thus, the LEL is 14,000 ppmv. Normally explosive levels may be reached in tanks, pits, or other confined spaces. Any area suspected of containing potentially explosive levels of gasoline will be evaluated with an intrinsically safe or explosion-proof combustible gas indicator (CGI). All air monitoring equipment will show data of last calibration within manufacturer specifications and the manufacturer's instruction manual will be on site.

Personnel response will be based on the following action levels from CGI readings. Please note that the crucial number is 5% of the LEL. When using a PID, 700 ppmv corresponds to 5% of the LEL.

- > If less than 5% of LEL, then continue activities and monitoring (<700 ppmv on the PID meter).
- > If greater than or equal to 5 of LEL, STOP WORK. Contact the Stantec PM or HSSE Representative to consider the implementation of engineering controls (rinsing, degassing, dry ice) to reduce the level before doing any other work. The hazard potential will be evaluated by Stantec's management, and a plan of action will be assessed.

Note: CGI readings are provided in percent of LEL; organic vapor meters (OVMs) or PIDs provide results in ppmv.

10.4 Bump Testing

Bump testing is required to ensure the proper operation of air monitoring equipment. Bump testing is measuring a known concentration of gas against the measured reading provided by the air monitoring instrument. Instrumentation readings that fall within the technical specifications of the instrument are within calibration. This HASP requires bump testing when there exists conditions for hydrogen sulfide gas to be present or an environment where personnel can work in an oxygen deficient or enriched atmosphere.

10.4.1 H₂S Monitors

All H₂S personal gas monitors must be bump tested within the last 24 hours prior to use. The daily bump test prior to use is done to ensure the device is not defective. Any H₂S monitor that fails the initial bump test shall not be used and the employee who was assigned that monitor may not enter the area where monitoring is required.

Note: Records of the bump test results will be documented on the daily field notes, any client-required permits, as well as in the equipment calibration log.

10.4.2 O₂ Monitors

Personnel shall perform a bump test for the O₂ personal monitor every day the meter is in use or at least every six months to ensure that the personal gas monitor is not defective. Any O₂ monitor that fails the initial bump test shall not be used and the work requiring the O₂ monitor will not be conducted until the monitor is repaired or replaced.

Note: Records of the bump test results will be documented on the daily field notes, any client-required permits, as well as in the equipment calibration log.

10.5 Heat Stress Program

This procedure applies to all employees when heat stress conditions exist at project sites. Should heat stress conditions exist, the Site Supervisor or the Project Manager shall complete the Heat Stress Control Checklist and implement the Heat Stress Protocol in Appendix G.

Temperature	Required Actions
Below 80°F	Have water readily accessible for all site workers (enough for 1 quart per hour of work per employee)
	Provide shade upon request in a timely manner
At 80°F and above	Shade Up! Erect canopy/shade if not already available
	Encourage frequent rest and water breaks
	Review/verify employee acclimatization
At 95°F and above	Stop Work to review Heat Stress Protocol:
	A) Verify all site workers ready/alert level(s)
	B) Implement Personal Heat Strain Prevention Plan
	C) Assign worker monitors (close monitoring required)
	D) Ensure reliable communication is in place
	E) Review heat-related emergency response plans
	F) Consider PPE and Direct Sun in Heat Index chart
G) Discuss the continued Scope of Work	
At 105°F (Heat Index) and above	Contact your HSSE Representative to ensure any continued work is closely monitored and approved

10.5.1 Training

The Site Supervisor will receive training in first aid and CPR, including training in heat-related illnesses. The Site Supervisor will also be trained on the requirement for heat stress monitoring. All workers should be capable of recognizing and treating the signs and symptoms of heat stress. During potential heat stress conditions, ice should be readily available to rapidly cool victims.

10.5.2 Fluid Replacement

Water will be made available at the site for site worker and visitor fluid replacement. When heat stress is determined to be a problem by the Site Supervisor, employees will be provided with balanced, electrolyte solutions to replace fluid and electrolyte loss. Employees will be provided with replacement fluids at a minimum rate of 1 quart per hour per person. When deemed necessary by the Site Supervisor, and in compliance with the Heat Stress Policy, water breaks will be taken a minimum of 15 minutes per hour of work. During the rest brakes, hydration will be mandatory and observed by the Site Supervisor. See the Heat Stress Index in Section 10.5.5 for further details.

10.5.3 Acclimatization

Acclimatization is a gradual physiological adaptation that improves an individual’s ability to tolerate heat stress. Full-heat acclimatization requires up to three weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the work activity in the heat stress conditions is discontinued. A noticeable loss usually occurs within three to four days.

10.5.4 Rest Breaks

When heat stress conditions are applicable, rest breaks should be taken out of the exclusion zone in a cooler, shaded, rest area. If these conditions are not available, more frequent rest breaks will be taken.

10.5.5 Heat Stress Monitoring

Heat stress and heat strain are conditions caused by environmental factors including temperature, relative humidity, radiant heat transfer, and air movement. The primary objective of the heat stress management program is to prevent heat stroke, which is life threatening and the most serious of the heat-induced disabilities. Extra caution should be taken for workers who are not acclimated to working in the heat.

The following Heat Stress Index should be used as a guide to evaluate heat stress situations. If the heat stress exceeds 105 degrees Fahrenheit (°F), contact the Stantec HSSE Representative prior to work for detailed guidance.

Heat Stress Index									
Temp. °F	Relative Humidity								
	10%	20%	30%	40%	50%	60%	70%	80%	90%
105	98	104	110	120	132				
102	97	101	108	117	125				
100	95	99	105	110	120	132			
98	93	97	101	106	110	125			
96	91	95	98	104	108	120	128		
94	89	93	95	100	105	111	122		
92	87	90	92	96	100	106	114	122	
90	85	88	90	92	96	100	106	114	122
88	82	86	87	89	93	95	100	106	115
86	80	84	85	87	90	92	96	100	109
84	78	81	83	85	86	89	91	95	99
82	77	79	80	81	84	86	89	91	95
80	75	77	78	79	81	83	85	86	89
78	72	75	77	78	79	80	81	83	85
76	70	72	75	76	77	77	77	78	79
74	68	70	73	74	75	75	75	76	77

Notes: Add 10°F when protective clothing is being used. Add 10°F when in direct sunlight.

HSI Temp	Category	Injury Threat
Above 130°F	Extreme Danger	No work unless emergency exists. Contact the SSHE Program Manager prior to proceeding. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
105° to 130°F	Danger	Contact the SSHE Program Manager prior to proceeding. Requires strict adherence to ACGIH Heat Stress Guidelines, including use of on-site WBGT equipment. Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
90° to 105°F	Extreme Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
80° to 90°F	Caution	Heat cramps or exhaustion likely, heat stroke possible if exposure is prolonged and there is physical activity.
Below 80°F	Normal Range	Typical conditions for time of year. Little or no danger under normal circumstances. As always, anticipate problems and work safely.

10.6 Cold Stress Program

The Cold Stress Program applies to all employees who perform fieldwork in cold environments at risk of cold stress injury. It is intended to protect workers from the most severe effects of cold stress.

10.6.1 Training

Stantec site employees have been trained in cold stress as part of their HAZWOPER 40-hour initial training. Site workers will receive refresher training by the Site Supervisor in cold stress safety and health procedures. The training program will include, as a minimum, instruction in the following areas:

- > Proper first-aid treatment.

- > Proper clothing practices.
- > Proper eating and drinking habits.
- > Recognition of impending frostbite.
- > Recognition of the signs and symptoms of impending hypothermia or excessive cooling of the body when shivering does not occur.
- > Safe working practices.

The Site Supervisor will be trained in first aid, CPR, and cold stress conditions.

10.6.2 Environmental Monitoring

Frostbite and hypothermia are two types of cold injury that personnel must be protected against during the performance of field duties. The objective is to prevent the deep body temperature from falling below 96.8°F and to prevent cold injury to body extremities. Two factors influence the development of a cold injury: the ambient temperature and wind velocity.

The Site Supervisor will monitor environmental conditions by recording ambient temperature and estimated wind speed. The information contained in Tables 8 and 9 will be used to evaluate the possibility of hypothermia among workers on site.

10.6.3 Protective Clothing and Rest Breaks

Use appropriate cold weather clothing when temperatures are at or below 40°F, as exposed skin surfaces must be protected. Protective items can include facemask, handwear, and footwear. Workers handling evaporative solvents during cold stress conditions should take special precautions to avoid soaking gloves and clothing because of the added danger of prolonged skin contact and evaporative cooling. Personnel will wear protective clothing appropriate for the level of cold and planned physical activity. The objective is to protect all parts of the body, with emphasis on the hands and feet. Eye protection against glare and ultraviolet light should be worn in snowy and icy conditions.

The work rate should not be so great as to cause heavy sweating that could result in wet clothing. If heavy work must be done, opportunities for rest breaks will be provided where workers have the opportunity to change into dry clothing. Conversely, plan work activities to minimize time spent sitting or standing still. Rest breaks should be taken in a warm, dry area. Windbreaks can also be used to shield the work area from the cooling effects of wind.

10.6.4 Identification and Treatment of Cold Stress

When frostbite, hypothermia, or other cold stress symptoms are suspected, treat the patient to relieve symptoms or transport them to the medical facility.

Table 8 Threshold Limit Value Work/Warm-up Schedule for Four-Hour Shift

Air-Temperature--Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
°C (approx.)	°F (approx.)	Maximum Work Period	No. of Breaks	Maximum Work Period	No. of Breaks	Maximum Work Period	No. of Breaks	Maximum Work Period	No. of Breaks	Maximum Work Period	No. of Breaks
-26° to -28°	-15° to -19°	(Norm. Breaks) 1	1	(Norm. Breaks) 1	1	75 min	2	75 min	2	55 min	3
-29° to -31°	-20° to -24°	(Norm. Breaks) 1	1	(Norm. Breaks) 1	1	75 min	2	55 min	3	40 min	4
-32° to -34°	-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	5
-35° to -37°	-30° to -34°	55 min	3	40 min	4	30 min	5	Non-emergency work should cease	5	Non-emergency work should cease	5
-38° to -39°	-35° to -39°	40 min	4	30 min	5	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5
-40° to -42°	-40° to -44°	30 min	5	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5
-43° & below	-45° & below	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5	Non-emergency work should cease	5

- Schedule applies to any four-hour work period with moderate to heavy work activity, with ten minutes in a warm location, and with an extended break (e.g., lunch) at the end of the four-hour work period in a warm location. For light to moderate work (limited physical movement), apply the schedule one step lower. For example, at -35°C (-30°F) with no noticeable wind (Step 4), a worker at a job with little physical movement should have a maximum work period of 40 minutes with four breaks in a four-hour period (Step 5).
- The following is suggested as a guide for estimating wind velocity if accurate information is not available: 5 miles per hour (mph): light flag moves; 10 mph: light flag fully extended: 15 mph: raises a newspaper sheet; 20 mph: blowing and drifting snow.
- If only the wind chill cooling rate is available, special warm-up breaks should be initiated at a wind chill cooling rate of about 1750 watts per square meter (W/m²) and all non-emergency work should cease at or before a wind chill of 2250 W/m². In general, the warm-up schedule provided above slightly undercompensates for the wind at the warmer temperatures, assuming acclimatization, and clothing appropriate for winter work. On the other hand, the chart slightly overcompensates for the actual temperatures in the cooler ranges because windy conditions rarely prevail at extremely low temperatures.
- TLVs apply only for workers in dry clothing.
- Adapted from Occupational Health & Safety Division, Saskatchewan Department of Labor.

Table 9 Cooling Power of Wind on Exposed Flesh Expressed as Equivalent Temperature

Estimated Wind Speed (mph)	Actual Temperature Reading (degrees F)																	
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60						
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60						
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68						
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95						
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112						
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121						
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133						
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140						
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145						
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148						
(Wind speeds >40 mph have little additional effect)	Little Danger If <1 hour with dry skin. Maximum danger of false sense of security						Increasing Danger Danger from freezing of exposed flesh within one minute.						Great Danger Flesh may freeze within 30 seconds.					
	Trench foot and immersion foot may occur at any point on this chart.																	

Table developed by U.S. Army Research Institute of Environmental Medicine in Natick, Massachusetts.

11 Decontamination Procedures

If warranted, work equipment and PPE will undergo gross decontamination on site. This gross decontamination will include washing contaminated equipment with a trisodium phosphate (TSP), Liqui-Nox® solution, or Simple Green®.

Grossly contaminated or used PPE (Tyvek™, gloves, and P-100 filters) will be disposed of in Department of Transportation (DOT) certified 55-gallon drums that are labeled identifying the contaminant.

At the completion of the project work, the drum will be sealed and disposed of per state and federal regulations. Respirators will be washed and decontaminated per manufacturer's specifications.

Subcontractors are required to comply with containment and decontamination procedure and regulations for asbestos or lead abatement. They will provide compliant decontaminant and waste management protocols and agency permits before conducting lead or asbestos work/decontamination.

12 Spill Containment

All hazardous substances and contaminated soils, liquids, and other residues are to be contained, stored, and labeled in accordance with federal, state, and local regulations. When drumming wastes, ensure the following practices are implemented:

- > Ensure waste material is compatible with the container (i.e., do not put highly acidic or alkaline wastes in steel drums).
- > Drums shall be inspected before waste is put inside. Ensure drums are not rusted or damaged.
- > Ensure proper labeling is applied that identifies the type of waste, date, and contact information on to drum before placing waste.
- > Only leave drums open when adding or removing the contents, otherwise drums are to be closed, which means the bung or drum ring is on and securely snug.
- > Preferred spacing of drums for on-site storage shall be 36 inches whenever possible. Drums need to be visibility inspected and readily accessible for emergency response.

Spill containment materials shall be on site during management of drums in the event of failure or leak.

Locations of drums and bins should minimize the possibility of contents leaving the site in the event of a failure of the containment. For containers containing flammable materials, fire extinguishing equipment shall be present and ready for use to control incipient fires. Drums shall not be used to work from or stand upon.

13 Emergency Response Procedures

If a location does not have a land line phone, or adequate cell phone coverage, personnel must ensure they have equipment available which will boost the signal so that in an event of an emergency, calls can be made. In the event of an emergency, all personnel must immediately STOP WORK. Shut off equipment if possible. Based upon the type of emergency, personnel should evacuate to the meeting location identified as per Section 3.3. Only if deemed safe to do so, personnel should attempt to mitigate the emergency situation (e.g., shutoff the source of a release). Once all personnel have been accounted for and the situation or meeting location has been deemed safe, the local fire or emergency response agency(ies) should be called, if deemed necessary as per Section 13.5. Once notifications to the local fire, response agency, or on-site client emergency response team are made (if necessary), immediately notify the Stantec Program Manager or HSSE Representative, in accordance with the notifications in Appendix J. Leaving a voicemail, sending a text or email does not qualify for notification; only speaking with a manager is acceptable. Provide details of the event to management at which point they will notify the client of the incident.

Stantec will report to the client as prescribed above for any emergency response incident as detailed in the previous paragraph. Each of these incident/events will be investigated to include a written submittal to the client to prevent reoccurrence.

13.1 Incipient Fire

An incipient fire is defined as a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, class II standpipe, or small hose systems without the need for protective clothing or breathing apparatus. In the event of a small contained fire, trained Stantec or subcontractor personnel may attempt to extinguish the fire provided personnel are not in danger of being trapped and will use the 20-pound fire extinguishers on hand, or other firefighting equipment that has been specified in the JLA and/or Project Plan (e.g., water truck, water hose). If the fire cannot be extinguished call the emergency telephone numbers listed at the beginning of this HASP (p. ii).

13.2 Spills or Releases

Spills or releases can occur in the event a liquid-containing line, vessel or tank is damaged during work. Before beginning work identify the following applicable disconnects or shutoffs at a site: electrical, water, gasoline emergency shut-off, fuel piping, and natural gas. Be prepared to disconnect or shutoff that utility in the event it is damaged during the performance of our work.

In the event of a release, employees are to conduct the following evaluation:

- > Am I in imminent danger from explosion, fire, or contamination? If so, leave the area immediately.
- > Contact your local office and inform them of the nature and extent of the release.
- > If additional help is required, call the emergency numbers in the beginning of this HASP (pp. ii and iii).
- > If safe to do so, turn off or close off the source of the leak.
- > Dike any openings to storm drains and try to contain spilled materials.
- > Based on resources available, begin cleanup of material, place into new tanks or drums, label, and leave drums and tanks secured and closed.

13.3 Overt Personnel Exposure

If overt personnel exposure occurs during the project, typical responses should include the following:

- > Personnel should be familiar with the chemical SDS for each project site and the requirements for treating exposure for each chemical handled.
- > Skin or eye contact: In general wash and rinse affected area thoroughly with copious amounts of soap and water, and then provide appropriate medical attention. Eyes and skin should be rinsed for a minimum of 15 minutes upon chemical contamination.
- > Puncture wound: Decontaminate and apply first aid coverings to the wound area. If the object that created the wound is still in the employee do not attempt to remove.
- > Follow the care management practices in Section 13.4.

13.4 Care Management

In the event of an incident resulting in physical injury, first aid will be administered on site. In the event that the severity of the injury requires emergency medical attention, the injured worker will be transported to the nearest hospital or occupational medical clinic for emergency treatment. The injured worker can be self-transported (only if working alone) or transported by a coworker or ambulance depending upon the life-threatening nature of the event.

Employees shall use the care management notification pull-out card (Appendix J) included in the HASP to direct the care management process.

Subcontractors may already have arrangements with a different occupational medical clinic or urgent care facility. Stantec shall allow an injured subcontractor employee to be taken to a location authorized by the subcontractor company and allow the subcontractor company to implement their care management policies and procedures.

Questions concerning the severity of the injury are to be directed to Stantec's nurse care management service (888) 449-7797. The service is available 24 hours per day, 365 days a year. The nurse will provide triage evaluation of the injured employee or subcontractor and advise whether first aid is sufficient or additional medical treatment from a clinic or emergency room is necessary. Employees are strongly encouraged to follow the nurse's instructions. This is for non-life-threatening related injury questions.

If the injured person requires treatment for a life-threatening injury, call 911 and make a request for an ambulance. Attempt to help the injured person only after ensuring the scene is safe. The injury person must be accompanied or followed to the offsite treatment location.

Client-required care management forms and flow chart are included in Appendix J (Care Management).

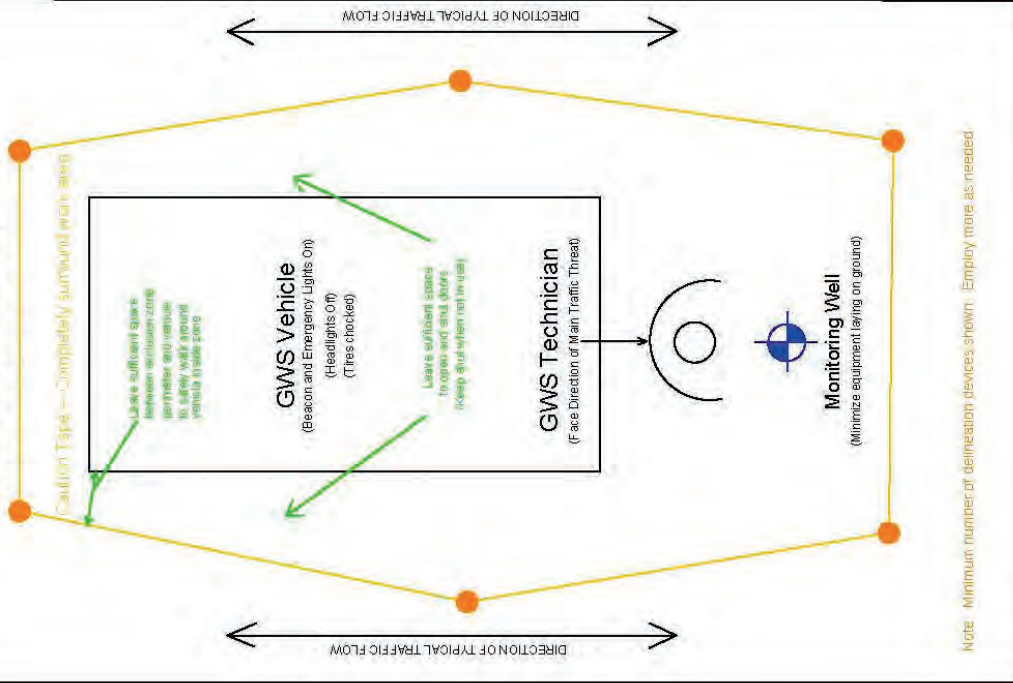
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Figures

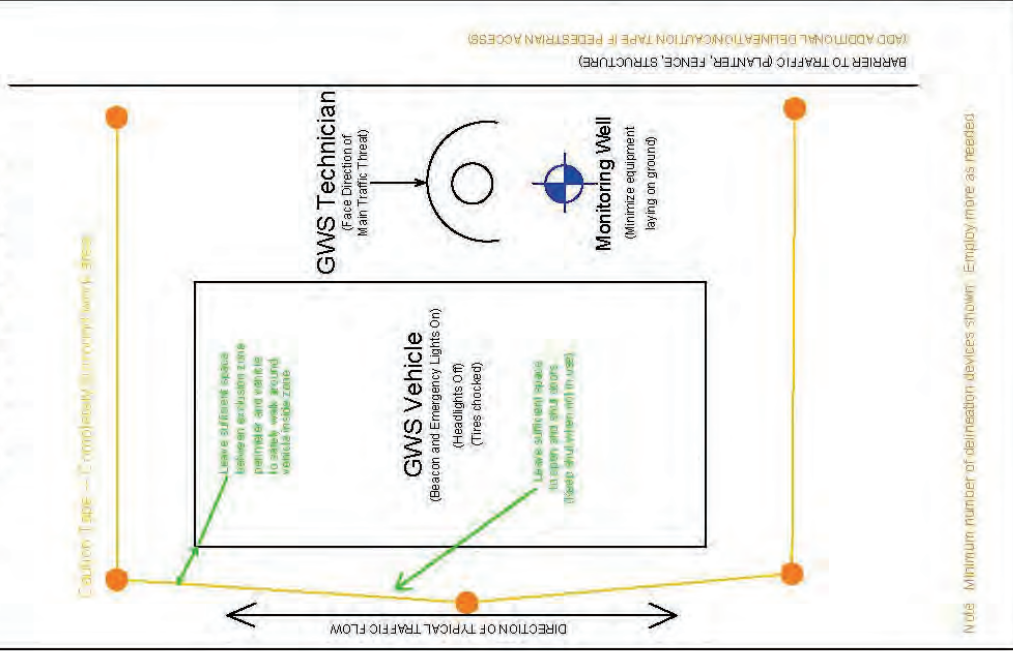
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REMEMBER TO ALWAYS STOP AFTER SETTING UP TRAFFIC CONTROL ZONE AND OBSERVE TRAFFIC FLOW. CONDUCT AN LPSA!!! IF YOU NEED TO ADAPT YOUR SETUP, DO IT! IF YOU CANNOT DO IT SAFELY, STOP IMMEDIATELY.

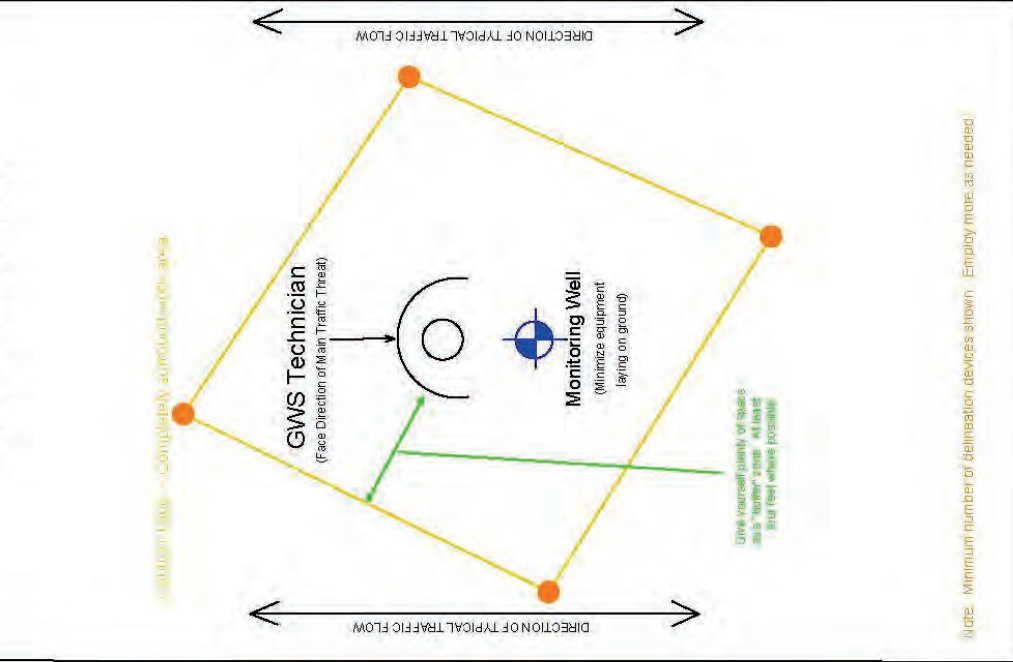
**GENERIC TRAFFIC CONTROL PLAN:
NO AVAILABLE BARRIERS**



**GENERIC TRAFFIC CONTROL PLAN:
AVAILABLE BARRIER**



**GENERIC TRAFFIC CONTROL PLAN:
NO VEHICLE ACCESS**

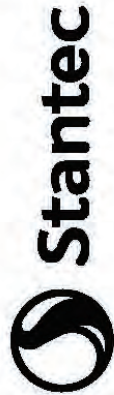


EXPLANATION

● Delineation Device (Min. 42 inches tall)

FN TCP.Generc

NOT TO SCALE



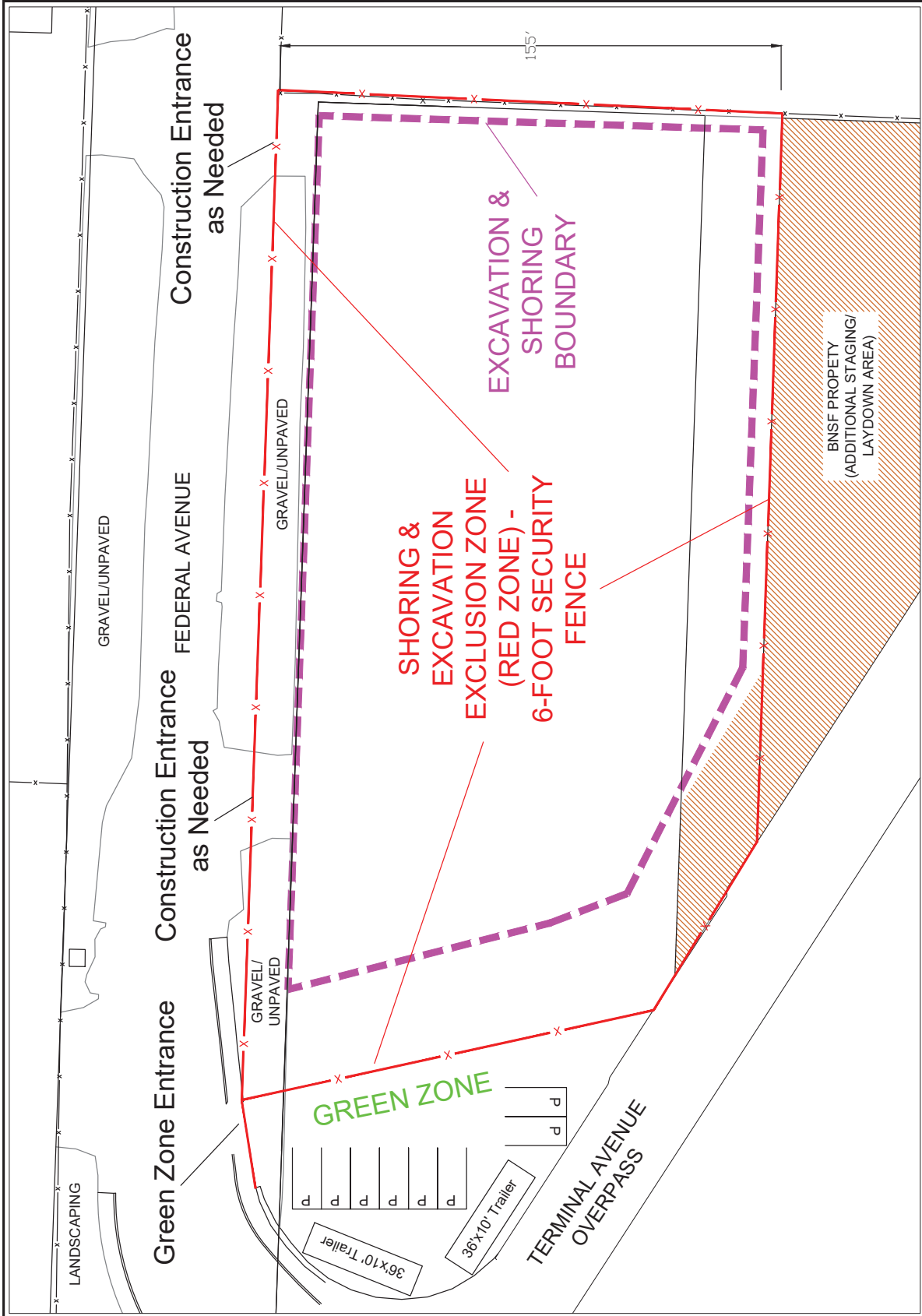
GENERIC TRAFFIC CONTROL DIAGRAM

PROJECT NO.
VARIOUS

PLATE
1

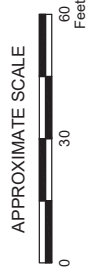
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EXPLANATION

SOURCE: Modified by maps provided by ASP1, LLC



PROJECT NO. 203722941		DRAWING C-1		SHEET NO. Sheet 1	
FN	203722941-RPP	NO.	0	PROJECT TITLE SHORING & EXCAVATION HEEZ	
LAST REV. DATE	05/22/23	DATE	05/22/23	OWNER EXXONMOBIL ADC 2717/2731 Federal Avenue Everett, Washington	
DATE	05/22/23	DRAWN	LANA COLE	SCALE 1" = 40'	
		APPROVED	BOBBY THOMPSON		

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Appendices

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ExxonMobil ADC
Stantec 203722941.HASP.2024

APPENDIX A
DAILY SITE SAFETY MEETING
ENGAGEMENT FORM

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ExxonMobil ADC
Stantec 203722941.HASP.2024

APPENDIX B
EXXONMOBIL WORK PERMIT
FORMS

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WORK PERMIT

WORK PERMIT DURATION MAY NOT EXCEED 16 HOURS PER DAY.
WORK PERMIT MAY BE REVALIDATED UP TO 7 DAYS FOR NON-HRC WORK.

A. Location and type of work to be performed:		Permit #:	
Issue Date:	Time: <input type="checkbox"/> AM <input type="checkbox"/> PM	Expiration Date:	Time: <input type="checkbox"/> AM <input type="checkbox"/> PM
Specific Location:	Extension Time: <input type="checkbox"/> AM <input type="checkbox"/> PM		
Work Description (Specify Work Activities):		Extension Approval: <input type="checkbox"/> Verbal Approval	
		Signature: _____	
Supervisor:		Supervisor Phone #:	
Site First Aid / Emergency Phone #:		# of Workers:	
Has short service worker(s) (SSW) received orientation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Does SSW have a designated mentor? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
B. Complete the Permit and Applicable Higher Risk Checklist(s) HRC, if applicable			
<input type="checkbox"/> Confined Space <input type="checkbox"/> Working at Heights <input type="checkbox"/> Hot Work <input type="checkbox"/> Working Near Moving Equipment			
<input type="checkbox"/> Energy Isolation <input type="checkbox"/> Lifting & Rigging <input type="checkbox"/> Excavation			
C. Pre-Work Checklist (jobsite inspection required):			
		Yes	N/A
1. Has the impact of this task on neighboring equipment, services and third parties been considered and addressed?			
2. Has the work activity, safety concerns and emergency procedures work been discussed with the local site contact?			
3. Have procedures for working with Hazardous Materials been reviewed and are understood by workers (e.g. Chemical approval/SDS, Asbestos controls, etc.)?			
4. Is emergency equipment available, per plan (e.g. Fire Extinguisher, Radio, Rescue Harness, etc.)?			
5. Are standby personnel trained and understand their responsibilities? <input type="checkbox"/> Spotter <input type="checkbox"/> Hazard Watch			
6. Has work area been evaluated for hazards (overhead, behind walls, below ground, etc.) with plan to mitigate hazards prior to starting work?			
7. Have you confirmed PPE identified during planning is available and in good condition?			
8. Have SIMOP hazards been identified and discussed with impacted personnel (List SIMOPs at bottom of page)?			
D. If there is a potential hazardous atmosphere or hazardous substance present, complete the Gas Test Supplement			
E. Site Setup (work may not begin until these are completed)			
		Yes	N/A
9. Overhead utility lines and minimum clearance requirements reviewed with site workers?			
10. Appropriate warning signs, temporary lighting and barricades have been considered to protect workers, prevent unauthorized access and establish work zone?			
F. Signatures (sign at work location before beginning work) If issuer/recipient changes, new issuer/recipient reviews and signs.			
<input type="checkbox"/> I have reviewed this checklist and all work arrangements with all workers involved and discussed work scope with local site contact as applicable. I verify I understand the purpose of the permit and applicable higher risk checklists.			
Local Site Contact (if applicable):		Contact Phone #:	
Issuer Company:			
Issuer / Relief Name:		Issuer Phone #:	
Recipient Company:			
Recipient / Relief Name:		Recipient Phone #:	
G. Permit Compliance Inspection (required each day) If additional space is needed use bottom/back of form.			
Date:	Time: <input type="checkbox"/> AM <input type="checkbox"/> PM	Performed By:	Comments:
Date:	Time: <input type="checkbox"/> AM <input type="checkbox"/> PM	Performed By:	Comments:
Date:	Time: <input type="checkbox"/> AM <input type="checkbox"/> PM	Performed By:	Comments:
H. Post Work / Job Status Permit issuer (or relief) is to sign off at end of work/shift			
Has the work site been inspected? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Discussed work activity status w/ local contact? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Is anything out of service and has everything been returned to safe condition? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Higher risk checklist(s) closeout completed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A			
Area/equipment/load secured, cleaned and returned to safe condition? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Permit Issuer (or relief):	Print:	Signature:	Date:
Permit Recipient (or relief):	Print:	Signature:	Date:
Local Site Contact (as applicable):	Print:	Signature:	Date:
Use this space to capture SIMOPS hazards and other site specific hazards and mitigation strategies:			
Prominently display permit at job site, if possible. Retain according to local regulations.			

WORK PERMIT DOCUMENT

ONLY COMPLETE SECTIONS APPLICABLE TO THE WORK DOCUMENTED ON THE WORK PERMIT

A. Initial Assessment

IMPORTANT: Sections A must be completed prior to the use of a gas detector being used in any job. Prior to use, all gas detectors must pass the bump test using manufacturer guidance. If a bump test is failed, a full calibration of the gas detector is required. Consider gas detector location placement. Always check the Oxygen value first. Most combustible gas meters are Oxygen dependent and are unreliable if Oxygen is insufficient.

1. Is the work capable of producing an ignition source when flammable or combustible materials are present? YES (HRC - HOT WORK REQUIRED) NO
2. Date of last full calibration: _____
Is this compliant with the manufacturer's recommended calibration frequency? YES NO (STOP WORK)
3. Is the gas detector working properly according to the bump test? YES NO (STOP WORK)

Chemical (Check in the following order)	Safe Working Range	Stop All Work		
1. Oxygen	> 19.5% & < 23.5%	< 19.5% OR > 23.5%		
2. LEL (%)	≤ 5% LEL	> 5% LEL		
3. Toxic Gasses	No Respirator Required	Respirator	SCBA or Supplied Air	STOP ALL WORK
	Hydrogen Sulfide ≤ 5 ppm	NO RESPIRATOR	>5 ppm	≥ 100 ppm
	Carbon Monoxide ≤ 25 ppm	NO RESPIRATOR	>25 ppm	≥ 1200 ppm

B. Gas Test Readings

Location: _____

Continuous Monitoring or Periodic Monitoring (Circle One)

Testing/Recording Interval _____ Hours

Time	Oxygen	LEL	H2S	CO	Other	Other
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Gas Tester's Company: _____

Gas Tester's Signature: _____

Date/Time _____ AM/PM

C. Confined Space Entrant Log

IMPORTANT: This log should always accompany a Work Permit, Confined Space Higher Risk Checklist and any other applicable Procedures or JLAs.

Name of Confined Space _____

	Entrant Name (Print)	Time In		Time Out		Time In		Time Out		Time In		Time Out	
1	_____												
2	_____												
3	_____												
4	_____												
5	_____												
6	_____												
7	_____												
8	_____												
9	_____												
10	_____												

Print Name of Supervisor: _____

Supervisor's Signature: _____

Date/Time _____ AM/PM

D. Revalidation (Multiday Permit)

ALLOWED FOR WORK PERMITS WITHOUT AN HRC IN ONE DAY INCREMENTS UP TO 7 TOTAL DAYS IF SITE PERSONNEL AND CONDITIONS HAVE NOT CHANGED. HRC CHECKLISTS MAY NOT BE REVALIDATED

COMPLETE INITIAL SITE INSPECTION. IF SITE CONDITIONS OR PERSONNEL HAVE CHANGED, NEW PERMIT REQUIRED

Date	Issue Time	Expiry Time	Recipient Signature	Issuer Signature	Day's Work Complete?	Time	Comments
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	
	AM/PM	AM/PM			<input type="checkbox"/> Yes	AM/PM	

Supervisor's Signature: _____

Date/Time _____ AM/PM

WORKING NEAR MOVING EQUIPMENT HIGHER RISK CHECKLIST

STOP WORK IF YOU ARE NOT CLEAR ON HOW TO IMPLEMENT LIFE SAVING ACTIONS

A. Location and Type of Work to be Performed:				Permit #:		
Date:	Time:	<input type="checkbox"/> AM <input type="checkbox"/> PM	Site:			
Performing Contractor:						
Description of work near heavy equipment or exposed to vehicle traffic:						
Trade/Craft Performing Work:						
Specific Location:						
B. Complete Checklist Before Beginning Work:				Yes	No	N/A
1. Has a Site Layout and/or Traffic Control Plan been established and reviewed?						
2. Have the path(s) of movement been considered for overhead lines, obstacles, swing radius etc.?						
3. Does heavy equipment have Rollover Protective Structure (ROPS), Falling Object Protective Structure (FOPS), Seat belt and Backup alarm as appropriate?						
4. Is loading/unloading performed on level stable ground?						
5. Are effective barriers in place to separate people from heavy equipment?						
6. Will there be simultaneous operations (SIMOPS) and have personnel been informed?						
If Yes, List SIMOPS hazards:						
Operator				Yes	No	N/A
7. Is Operator(s) trained and competent and do they understand their roles and responsibilities?						
8. Has Operator inspected the Heavy equipment including safety equipment and corrected any deficiencies prior to use?						
9. Can Operator(s) explain PPE requirements inside and outside cab; how to enter and exit equipment; driving without distractions (NO cell phones and radios, eating, drinking, etc.)?						
Spotter				Yes	No	N/A
10. Is Spotter(s) trained and competent and do they understand their roles and responsibilities?						
11. Is Spotter positioned out of line of fire of the equipment? If in the Red Zone, does Spotter have clear "line of sight" of Operator?						
12. Can Spotter and Operator demonstrate minimum clearance distances from structures, electrical lines and other overhead hazards?						
13. Can the Spotter and Operator explain their communication plan? (hand, verbal or radio communication; air horn for immediate shutdown; no cell phones allowed in the exclusion zone; stop equipment if communication is lost or spotter is not available)						
14. Can the Spotter and Operator explain Spotter locations and what to do if the Spotter must enter swing and fall zones, lift load swing and line of fire of lifted loads?						
Traffic Control				Yes	No	N/A
16. Has traffic in and around the work area been considered?						
17. Is all necessary Traffic Control equipment on site, and will it be installed and secured per the Traffic Control Plan?						
18. Is a buffer area needed? If so, is it large enough to separate traffic from the work?						
19. Are flaggers being used where traffic control, by other means, is inadequate?						
C. Stop Work Triggers						
Discuss and cite examples of when to Stop Work:						

Minimum Clearance between Operating Heavy Equipment and Overhead Electrical Lines

Voltage (kV)	Distance Between Line and any Part of Heavy Equipment	
Up to and including 50	10 feet	3.1 meters
Over 50 to 200	15 feet	4.6 meters
Over 200 to 350	20 feet	6.1 meters
Over 350 to 500	25 feet	7.6 meters
Over 500 to 750	35 feet	10.7 meters
Over 750 to 1000	45 feet	13.7 meters
Over 1000	As established by the operator of line or registered professional engineer who is a Qualified Person	

Minimum Clearance between Heavy Equipment in Transit and Overhead Electrical Lines

Signs warning of overhead hazards are in place 23 ft (7m) on each side of the electrical line, when traveling under the lines.

Equipment with booms, lifts, rigging, excavator arms, masts, etc., must be fully lowered to the maximum extent prior to transit.

Voltage (kV)	Distance Between Line and any Part of Heavy Equipment	
Up to and including 0.75	4 feet	1.2 meters
Over 0.75 to 50	6 feet	1.8 meters
Over 50 to 345	10 feet	3.1 meters
Over 350 to 750	16 feet	4.9 meters
Over 750 to 1000	20 feet	6.1 meters
Over 1000	As established by the operator of line or registered professional engineer who is a Qualified Person	

No Perimeter Fence Present	Demolition	Construction & Excavation	Cranes/Lifting	Drilling	M & R
Construction Panels/Hoarding	✓	✓	✓	✓	✓
Fence and/or mesh panels -6' to 8'	✓	✓	✓	✓	✓
Fence and/or mesh panels - 4'	✗	✓	✓	✓	✓
Barricades	✗	+	✓	✓	✓
Jersey Barricades	✗	+	✓	✓	✓
Safety Snow Fencing	✗	+	✓	✓	✓
Collapsible Barriers	✗	✗	✓	✓	✓
Delineators/Cones and Tape	✗	✗	+	✓	✓
Cones	✗	✗	✗	+	✗

Perimeter Fence Present	Demolition	Construction & Excavation	Cranes/Lifting	Drilling	M & R
Construction Panels/Hoarding	✓	✓	✓	✓	✓
Fence and/or mesh panels -6' to 8'	✓	✓	✓	✓	✓
Fence and/or mesh panels - 4'	✗	✓	✓	✓	✓
Barricades	✗	✓	✓	✓	✓
Jersey Barricades	✗	✓	✓	✓	✓
Safety Snow Fencing	✗	✓	✓	✓	✓
Collapsible Barriers	✗	+	✓	✓	✓
Delineators/Cones and Tape	✗	+	+	✓	✓
Cones	✗	+	+	+	✓
No Demarcation	✗	✗	✗	✗	✓

Examples of acceptable Red / Orange / Green Zone configurations



HOT WORK HIGHER RISK CHECKLIST

A HOT WORK HRC IS REQUIRED WHEN PERFORMING WORK CAPABLE OF PRODUCING AN IGNITION SOURCE WHEN A POTENTIAL OR ACTUAL FUEL SOURCE IS PRESENT

A. Location and Type of Hot Work to be Performed: **Permit #:**

Date: _____ Time: _____ AM PM Site: _____

Performing Contractor: _____ Name of Fire Watch: _____

Description of Hot Work: _____

Specific Location: _____

Potential/Actual Fuel Source: _____ Potential/Actual Ignition Source: _____

B. Complete Checklist Before Beginning Work:

	Yes	No	N/A
--	-----	----	-----

1. Have all fuel sources been removed (i.e. product dispensers, tanks, etc./location and equipment) where Hot Work will be performed?			
2. Has a risk assessment been performed for potential fuel sources that cannot be controlled and are within 11 m (35 ft) of Hot Work activities?			
3. Are protections in place for area below overhead Hot Work to catch hot metal, sparks?			
4. If potential for hazardous atmosphere, is explosion proof equipment being used?			
5. Is there a trained Fire Watch to watch for fires during and 30 minutes after Hot Work?			
6. Is the correct PPE available for the individual performing the hot work activity (e.g. fire retardant jacket, leather gloves, face shield etc.)?			
7. Are all required safety items in reach and communicated to the work team including, but not limited to fire extinguishers, fire blankets, water sprays and spark containment?			
8. Is the correct fire extinguisher available for the fuel source, fully charged, sealed and inspected?			
9. Have sewer openings, flammable liquids and combustible materials in the area that could affect safe Hot Work (within 11 m (35 ft)) been covered/removed?			
10. Has equipment that is capable of arcing been grounded?			
11. If there is a potential for hazardous atmosphere, has an initial gas test (minimum of O2 and gas) been completed?			
12. If a potential hazardous atmosphere exists, has continuous monitoring been set up within 1 m (3 ft) of the ignition source?			
13. Is spark containment, barricades or arc blinds in place, if needed?			
14. Will there be simultaneous operations (SIMOPS) and have personnel been informed?			
15. Has gas testing been documented on Work Permit? If atmospheric conditions have changed or work has stopped for 30 min, additional gas testing is required before continuing work.			

List SIMOPS hazards (if applicable):

C. Stop Work Triggers

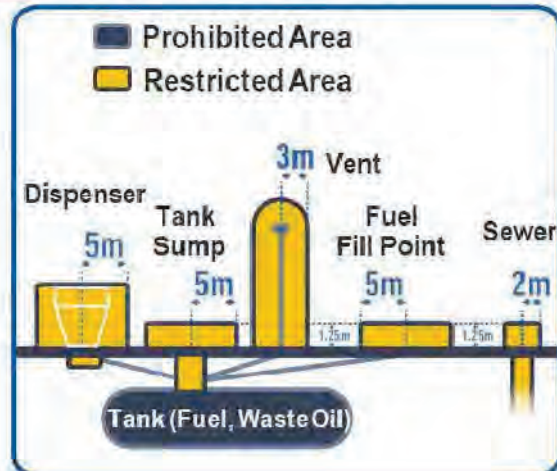
Discuss and cite examples of when to Stop Work:

H. Reference for Retail Sites

No Hot Work allowed in Tanks (**Prohibited Area**)

Hot Work in a **Restricted Area** only when 0% LEL has been confirmed.

Hot Work activities must stop during fuel deliveries.



Fire Watch Requirements

A Fire Watch is required for all work requiring a Hot Work permit or Higher Risk Checklist.

The Fire Watch must:

- Be at the job site during the entire hot work operation
- Have adequate fire-extinguishing equipment readily available (minimum one fully-charged, sealed and inspected dry chemical fire extinguisher meeting local regulations)
- Be trained in the use of fire-extinguishing equipment
- Inspect fire-extinguishing equipment and ensure it is in safe working order
- Observe the hot work and watch for fires in all exposed areas
- Extinguish fires within the capacity of the equipment available
- Warn personnel performing hot work of any fire conditions
- Keep people out of and warn of hazards associated within the hot work location (i.e. Hot metal, burn hazards, etc.)
- Have available means of intrinsically-safe outside communication

Maintain a fire watch at least a **half hour** after completion of work requiring a hot work permit to detect and extinguish possible fires.

EXCAVATION HIGHER RISK CHECKLIST

AN EXCAVATION HRC IS REQUIRED WHEN PERFORMING GROUND DISTURBANCE ACTIVITIES AT A DEPTH GREATER THAN 15 cm (0.5 ft), INCLUDING DRILLING and WORKING IN TRENCHES / EXCAVATIONS.

A. Location and type of work to be performed:

Permit #:

Date: _____ Time: _____ AM PM Site: _____

Performing Contractor: _____

Description of Boring/Drilling/Excavation/Trenching Work: _____

Specific Location: _____

B. Check Type of Work To Be Performed:

- Excavation Boring
 Trenching Subsurface Clearance
 Drilling Other: _____

C. Complete Checklist Before Beginning Work:

	Yes	No	N/A
1. Have records of underground utilities been reviewed, utility companies consulted and detection equipment used to identify hazards? Has Subsurface Clearance Process been completed, as applicable?			
2. Has a worker walked the site to confirm the underground utilities/structures are marked (utilities: natural gas, phone, power and water lines; structures: meters, electrical panels, manholes, former pump islands, tanks, pipes)? Are utilities/structures/materials supported as needed?			
3. Is soft/hand digging planned for uncovering higher risk utilities within 1.5 m (5 ft) of excavation (fiber optic cable, pipelines, electrical lines >50V, fuel systems, sewer lines)?			
4. For Excavations, has a Competent Person performed a soil classification and established safe setback distances to prevent collapse/accidental entry of personnel and equipment?			
5. Does the equipment operator and spotter have a clear view of work area?			
6. Are communication methods between spotter and equipment operator understood (Hand signals, radio, etc.)?			
7. Does everyone know to immediately stop work and notify Supervisor if hydrocarbons, electrical lines, water are encountered?			
8. Are appropriate barricades in place?			
9. If personnel are entering an excavation, has a rescue plan been developed and reviewed?			
10. Is gas testing required? If Yes, document on Work Permit.			
Excavation / Trenching	Yes	No	N/A
11. Is a Competent Person present to perform inspections at the start of shifts and after rain/snow/heavy vibration to look for atmospheric and cave-in hazards and/or supervise all entries?			
12. Have protective systems been designed for the excavation and installed? If > 6 m (20 ft) they must be designed by a qualified person (i.e. professional engineer).			
13. Is fall protection required? If Yes, complete Working at Heights HRC.			
14. Is equipment located a minimum of 0.6 m (2 ft) from the edge of the excavation?			
15. Is excavated material/other items set back 1 m (3 ft) from the edge of the excavation?			
16. Has all water and/or other accumulations been removed from excavation as required?			
Drilling/Boring	Yes	No	N/A
17. Are cages or interlocks in place around rotating equipment?			
18. If there are no cages or interlocks, is a Drill Operations Exclusion Zone in place 1 m (3 ft) around the drill stem?			
19. Have personnel verified that there is no loose clothing, and that long hair, jewelry, and equipment, is tied back away from rotating equipment?			

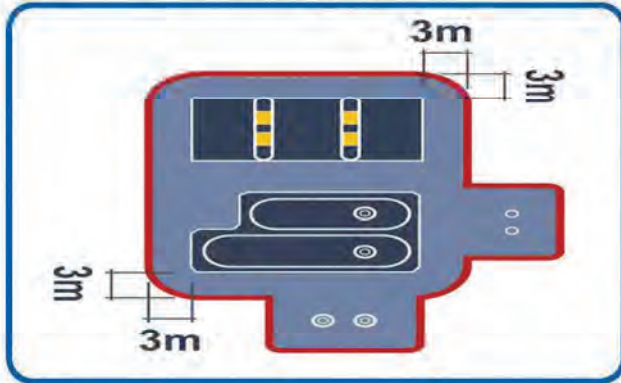
D. Stop Work Triggers

Discuss and cite examples of when to Stop Work:

Identify locations of underground hazards in "Careful Digging Zone"

- Underground tanks and all piping
- Area around pump/dispensing equipment
- Areas between tanks and pumps (potential piping areas)

Careful Digging Zone



Utility/Facility	Description of Location Found Onsite	Approximate Depth Below Ground Surface	Locating Method
Electrical lines			
Gas lines			
Pipelines			
Steam lines			
Water lines			
Sanitary			
Storm-water			
Sewer lines			
Pressured air-lines			
Tank vent lines			
Fiber Optic lines			
Underground Storage Tanks			
Phone Lines			
Other (describe)			

CONFINED SPACE ENTRY HIGHER RISK CHECKLIST

STOP WORK IF YOU ARE NOT CLEAR ON HOW TO IMPLEMENT LIFE SAVING ACTIONS

A. Location and Type of Work To Be Performed: Permit #:

Date: _____ Time: _____ AM PM Site: _____

Performing Contractor: _____ Trade/Craft Performing Work: _____

Description of work and equipment to be used within confined space: _____

Name and Location of Confined Space: _____

B. When to Use:

A Confined Space is an enclosed or partially enclosed space/structure that is: • not designed for continuous human occupancy; and • an opening large enough for one's torso and head to pass either intentionally or unintentionally; and • has limited or restricted means of entry and exit	Complete Permit Required Confined Space Section if Any Apply: • a hazardous atmosphere and/ or toxic environment exists or may form, or • has an internal configuration that might cause entrant to be trapped or asphyxiated, or • contains a material with the potential to engulf someone who enters the space, or • contains any other recognized serious safety or health hazards.
---	--

Known Space Hazards: _____

Communication Method: Visual Cell Radio Other (specify): _____ Planned Duration of Entry: _____ Hours

C. Complete BEFORE Beginning Work in a Confined Space:

	Yes	No	N/A
1. Have all personnel involved reviewed the Confined Space Entry Procedures, and do they have the required training?			
2. Has an atmospheric check been completed and recorded, and indicates no hazardous atmosphere exists?			
3. Has the surrounding areas been surveyed to avoid hazards from drifting vapors, engulfment, etc.?			
4. Is there a minimum of one exit accessible from all points of the Confined Space?			
5. Has the communication equipment (radios, hailer, air horn, etc.) been approved, inspected and tested?			
6. Is the Confined Space entry permit in place where required by local regulations?			
7. Are there barriers and signage at each access point to prevent unauthorized entry?			
8. Is a documented Rescue Plan in place and has it been reviewed by all Confined Space Workers? Attach rescue plan if applicable.			
9. Has Rescue Service availability throughout the duration of the entry been verified?			

Rescue Services Provided By: _____ Phone Number: _____

D. Complete for Permit Required Confined Spaces

11. Identify and confirm inspection of the equipment that will be used for entry/ rescue (Check, if applicable):	<input type="checkbox"/> Safety Harness and lifelines for Entry and Hazard Watch <input type="checkbox"/> All equipment listed Class 1, Division 1, Group D and Non- Sparking tools <input type="checkbox"/> All equipment will not require a Hot Work Permit <input type="checkbox"/> SCBA's or SARs for Entry and Hazard Watch <input type="checkbox"/> Hoisting Equipment
12. Confirm the Entrant, Hazard Watch, and Rescue Personnel received and reviewed the following specialized training?	<input type="checkbox"/> Respirator <input type="checkbox"/> Ventilation Equipment <input type="checkbox"/> Breathing Apparatus <input type="checkbox"/> Safety Harness and Life-Lines <input type="checkbox"/> Retrieval Equipment
13. Are ventilation requirements identified and is the equipment available? If needed, it must be utilized throughout the entire entry duration. (Verify atmospheric conditions are safe before entry)	<input type="checkbox"/> Yes <input type="checkbox"/> No
14. If a breathing apparatus is required, does the supplied air meet local standards?	<input type="checkbox"/> Yes <input type="checkbox"/> No
15. Have the following hazards present in the space been eliminated or controlled to allow for safe entry?	<input type="checkbox"/> Source Isolation <input type="checkbox"/> Drain, Flush, Clean <input type="checkbox"/> Energy Isolation <input type="checkbox"/> Purged / Flush / Vent / Temperature <input type="checkbox"/> Disconnect Lines <input type="checkbox"/> Exhausting or Ventilation

Monitor atmosphere continuously for oxygen and LEL (and any other gases as per assessment) using continuous monitoring with the appropriate equipment. If work stopped for >30 minutes, gas test prior to continuing. Record on Work Permit.

I have reviewed this checklist and all other work arrangements with all other workers involved in this work.

E. HRC Review Confirmation (Use back side of form if additional signatures are required)

Confined Space Entrant Name (Print)	Signature	Date	Time
1. _____	_____	_____	_____
Hazard Watch Name (Print)	Signature	Date	Time
1. _____	_____	_____	_____
Entry Supervisor Name (Print)	Signature	Date	Time
1. _____	_____	_____	_____

F. After Work in a Confined Space

Were any unexpected hazards confronted or created in the permit space during entry? Yes No

If yes, list them and ensure they are removed when developing this checklist for following day's work:

G. Stop Work Triggers

Discuss and cite examples of when to Stop Work:

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WORKING AT HEIGHTS CHECKLIST

MUST BE UTILIZED WHEN WORKING AT HEIGHTS GREATER THAN 1.8 METERS / 6 FEET

A. Location and type of work to be performed:

Permit #: _____

Date: _____ Time: _____ AM PM Site: _____

Performing Contractor: _____

Task Description: _____

Specific Location: _____

B. Reference Material

Lanyard = lanyard length + deceleration distance (shock-absorber) + worker height + safety factor (0.61 meters/3 feet) - head to back d-ring height

Self-Retracting Lifeline (SRL) = housing length + deceleration distance (rope-grab) + worker height + safety factor (0.61 meters/3 feet) - head to back d-ring height

C. Complete Checklist Before Beginning Work:

If a fall hazard of greater than 1.8 meters (6 feet), must choose one of the below:

- Guardrail in place
- 100% Tie-off required
- Stay back greater than 1.8 meters (6 feet) from leading edge

D. Complete Checklist Before Beginning Work:

	Yes	No	N/A
1. Can work be completed without working at heights?			
2. Are all personnel working at heights appropriately trained, as described in the Minimum Safety Expectation?			
3. Has a spotter been designated and understand their role and responsibilities?			
4. Have weather conditions been considered?			
5. Has necessary equipment been inspected prior to use?			
6. Are all required barricades in place?			
7. Has work been protected against dropped objects (i.e. tools tied off, mats laid over gratings, toe boards in place, etc.)?			
8. Are the ground conditions/work surface stable for the equipment?			
9. Have the load limits of the equipment been considered?			
10. Is all fall protection equipment attached to an engineered anchor point with the appropriate load rating?			
Ladders	Yes	No	N/A
11. Is the ladder in good condition, been inspected, have suitable load rating and made with appropriate material?			
12. Are the crossbars extended and locked?			
13. Do personnel understand the requirement to maintain 3 points of contact at all times while climbing a ladder?			
Extension Ladders	Yes	No	N/A
14. Is the upper portion tied off (co-worker must hold the ladder during tie off and removing tie off)?			
15. Does the top of ladder extend 1 meter (3 ft.) or 3 rungs above the edge? (do NOT use top 3 rungs).			
16. Is the ladder angle at a 4:1 ratio?			
Scaffolding	Yes	No	N/A
17. If using scaffolding, is it appropriately tagged for use?			
18. If modifications are needed, is a qualified scaffold person present to perform modifications?			
19. Are scaffold wheels/footing properly secured?			
Aerial Platforms / Mobile Elevated Work Platforms (MEWP)	Yes	No	N/A
20. Have all fall restraint/fall arrest anchor points been identified?			
21. Do all workers involved understand that they must not sit, stand, or climb on the guardrails?			
22. Do all workers involved understand that they must not use other equipment to gain height (ladders, step ups, etc.)?			
Roof Work	Yes	No	N/A
23. Are all fall protection requirements in place, consistent with Minimum Safety Expectations?			

E. Rescue: (Choose One)

- Self-Rescue
- Rescue personnel and equipment on site
- Use off-site rescue (local emergency telephone number)

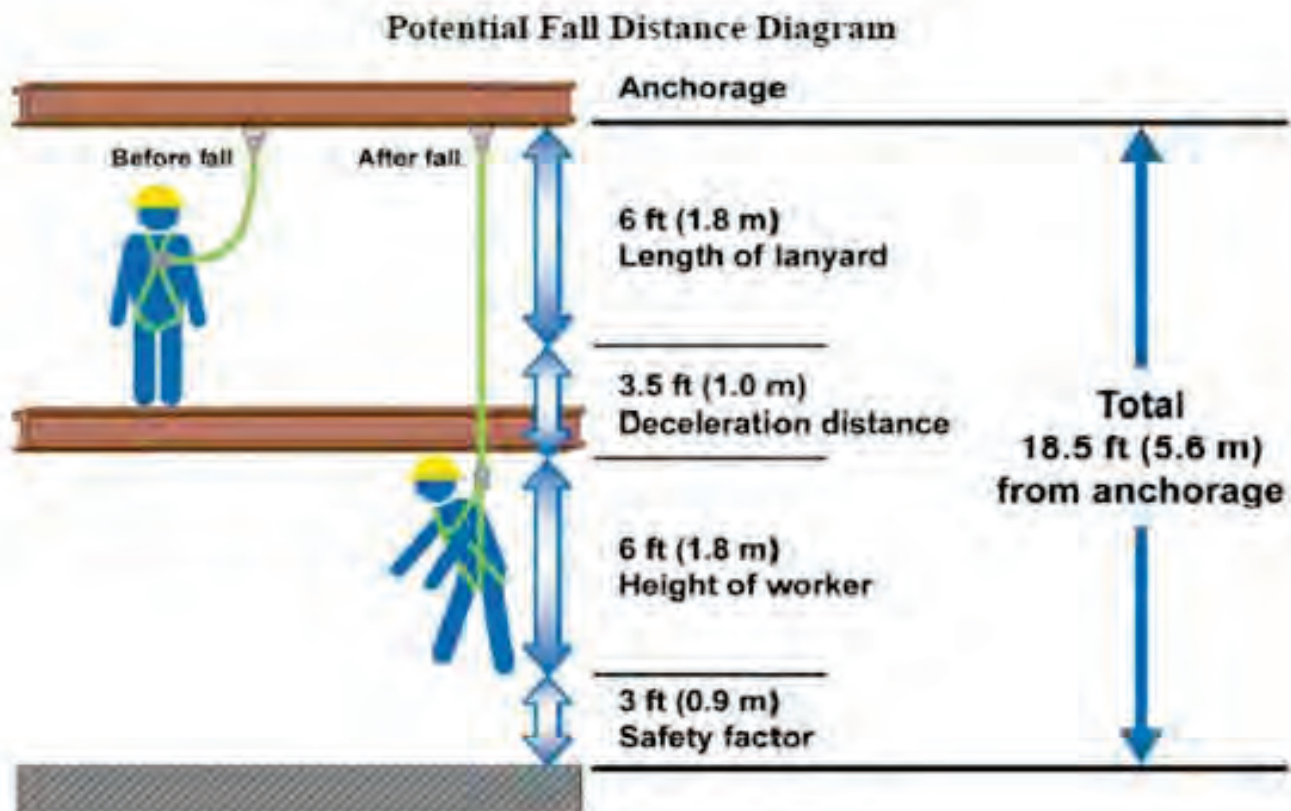
F. Stop Work Triggers

Discuss and cite examples of when to Stop Work:

Selecting a Lanyard

The total clearance required for a fall arresting system (length of lanyard, deceleration distance, height of personnel and the safety factor of 3 ft (0.9m)) must be calculated to ensure the correct lanyard is selected.

Example of Proper Fall Distance: Fall protection will protect personnel before contact with surface below



Lifting and Rigging Checklist

STOP WORK IF YOU ARE NOT CLEAR ON HOW TO IMPLEMENT LIFE SAVING ACTIONS

A. Location and Type of Work to be Performed:				Permit #:		
Date: _____ Time: _____ <input type="checkbox"/> AM <input type="checkbox"/> PM Site: _____						
Performing Contractor: _____						
Description of Lifting and Rigging Work: _____						
Trade/Craft Performing Work: _____						
Specific Location: _____						
B. Complete Checklist Before Beginning Work:				Yes	No	N/A
1. Has a Site Layout Plan, equipment/personnel positioning and/or Traffic Control Plan been established and reviewed? Is access to crush, drop zones, and counterweights controlled/restricted?						
2. Has competency been confirmed for each member of the Lift Crew? Operator, Rigger, Signal Person, Spotter, etc.						
3. Has the operator confirmed if the lift is "Basic" or "Complex?"						
4. Has the Operator, Riggers, Signal Person, and Spotters reviewed the lift plan?						
5. Is the lift blind, complicated, heavy, or will personnel be lifted?						
6. Does the lift plan include mitigations for load shifts, dropped objects, load path obstructions, overhead obstructions, and address working under suspended loads as required?						
7. Is the loading/unloading site and lifting site level and stable (ground, matting, enough space for outrigger deployment)?						
8. Is the lifting equipment stable per manufacturer specifications?						
9. Will a dry run be performed?						
10. Is load weight within the range of the equipments safe working limit?						
11. Are the lifting equipment safety devices in place and working?						
12. Will there be simultaneous operations (SIMOPS) and have personnel been informed?						
If Yes, List SIMOPS hazards: _____						
Operator				Yes	No	N/A
13. Has Operator been trained on the specific make and model of the crane to be used?						
14. Has Operator inspected the lifting equipment including safety equipment and corrected any deficiencies prior to use?						
15. Has Operator checked wind speed, and continue to monitor through lift, to ensure the lift is performed within allowable limits to safely control the load?						
16. Can Operator(s) explain PPE requirements inside and outside equipment/cab; how to enter and exit equipment; driving without distractions (NO cell phones and radios, eating, drinking, etc.)?						
Rigger/Signal Person/Spotter				Yes	No	N/A
17. Has lifting and rigging equipment been inspected, certified, and is it properly rated for the task? Has this inspection been documented on the Rigging Plan Checklist when load weighs more than 2 tons?						
17. Have loads been analyzed to determine the potential instability/tilting/inverting, and proper rig/support/constrain been identified, to ensure stability?						
18. Can Lift Personnel and Operator demonstrate minimum clearance distances from structures, electrical lines and other overhead hazards?						
19. Can the Lift Personnel and Operator, explain their communication plan? (hand, verbal or radio communication; air horn for immediate shutdown; no cell phones allowed in the exclusion zone; stop equipment if communication is lost or spotter is not available)						
20. Can the Lift Personnel and Operator explain personnel locations and what to do if personnel must enter swing and fall zones, lift load swing and line of fire of lifted loads, and how control of the red zone will be maintained?						
Traffic Control				Yes	No	N/A
21. Has traffic in and around the work area been considered?						
22. Is all necessary Traffic Control equipment/personnel on site, and will it be installed and secured per the Traffic Control Plan?						
23. Is a buffer area needed? If so, is it large enough to separate traffic from the work?						
24. Are flaggers being used where traffic control, by other means, is inadequate?						
C. Stop Work Triggers						
Discuss and cite examples of when to Stop Work:						

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ENERGY ISOLATION HIGHER RISK CHECKLIST (LOTO)
STOP WORK IF YOU ARE NOT CLEAR ON HOW TO IMPLEMENT LIFE SAVING ACTIONS

A. Location and Type of Work to be Performed:

Permit #:

Date: _____ Time: _____ AM PM Site: _____

Performing Contractor: _____

Task Description: _____

Trade/Craft Performing Work on Isolated Source: _____

Specific Location: _____

B. Complete Checklist BEFORE Beginning Work:

	Yes	No	N/A
1. Have all affected workers (including simultaneous operations)/site personnel been informed that energy source will be turned off by the Authorized worker?			
2. Have Energy Isolation Device(s) been checked before usage for effectiveness?			
3. Are lock out devices durable and strong enough to prevent accidental removal?			
4. Are valves used for isolation labelled and secured to prevent inadvertent operation?			
5. Did worker verify that tags are weather resistant and include the Authorized Worker's name, contact number, date, time and appropriate warning?			
6. Have all potential energy sources related to this work been locked/tagged out and de-energized at the source by the authorized employee that attached the lock? <i>(Electrical, Hydraulic, Pneumatic, Gravitational, Mechanical, Stored, Thermal/Chemical)</i>			
7. Will the work require the isolation of any auxiliary equipment? If yes, isolate and confirm isolation.			
8. Only Authorized Worker has the key to their lock?			
9. Has a detailed list of isolated equipment and methods been included with this checklist (e.g., Isolation Certification Form.)			

C. Verification (Test Out, Try to Start)

	Yes	No	N/A
1. Is volt meter/induction meter functioning properly on a known source of electrical energy?			
2. Has a qualified person verified that equipment cannot be re-energized while isolating devices (switches, circuit breaker) are in open position or there is a physical break?			
3. Has Zero Energy state been confirmed?			
4. Has an independent field verification been carried out?			

Repeat Sections B and C for each additional circuit: Circuit 2 Circuit 3 Circuit 4 Circuit 5 Circuit 6

D. Multiple Crews Working on the Same Power Supply

	Yes	No	N/A
1. On arrival, has the new crew discussed planned work with crew(s) already using LOTO?			
2. Has each crew member attached their own locks & tags to the energy source?			

E. Complete Checklist AFTER Service Work Finishes

	Yes	No	N/A
1. Have all affected workers/site personnel been informed that energy sources will be restored?			
2. Have all locks and tags been removed from the energy source by the authorized worker that placed the lock/tag on the equipment?			
3. Has the impacted equipment been tested to verify it is operating properly?			

F. Stop Work Triggers

Discuss and cite examples of when to Stop Work:

For transfer, New Authorized Worker Name: _____

Isolation Certification Form

Site Name:

Specific Location of Work:

Completed By:

Date:

EID #	Equipment Requiring Energy Isolation:	Equipment Being Isolated (e.g. Breaker 17K)	Model Number/Manufacturer/ID:	EID Type See Energy Isolation MSE for complete list (e.g., valve, blind)	Action (e.g. turn breaker off, lock and tag)	Energy Source (Electrical 480v, 3P, AC)	EID Location	Energy Verification Method See Energy Isolation MSE
1								
2								
3								
4								
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ExxonMobil ADC
Stantec 203722941.HASP.2024

APPENDIX C
TASK-SPECIFIC JOB LOSS
ANALYSIS SHEETS

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Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 13
WORK ACTIVITY (Description):			
DRIVING The Driving JLA covers the pre-drive hazards check, leaving and entering driveways, general driving, intersections, long-distance driving, stopping, and parking.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Fire Extinguisher, First Aid Kit, Triangles or Cones, Spare Tire, Jack, Wheel Chocks			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Alejandro Chairez	Environmental Technician	Sean Guiltinan	SSH&E Program Manager
Bridget Cook	Staff Scientist	Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input type="checkbox"/> Reflective Vest <input type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Safety Shoes—Type: _____	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input type="checkbox"/> PPE Clothing—Type: _____	<input type="checkbox"/> Gloves—Type: _____ <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Engine Start & Initial Drive	<ul style="list-style-type: none"> Mechanical Failure causing operator to lose control or cause an accident from no working horn, signal, poor visibility, etc. Collision with pedestrians, vehicles, or property 	Perform a complete vehicle inspection at the beginning of the drive: <ul style="list-style-type: none"> Check the windows. Are they clean? Ensure the wipers work. Check the tires for proper inflation and tread. Check the Registration/Insurance/Maintenance report. Are they all current? Check the horn, lights, and back-up alarm (if equipped) for proper operation. Check for wheel chocks. Check the gauges on the instrument panel. Are they working correctly and giving satisfactory readings? Check for body damage. Are there any unsafe parts ready to fall off during the drive? Check under the vehicle. Are there any leaks or obstructions? Check and secure loose items in the cab, passenger area, trunk, and/or truck bed. Adjust the belt/shoulder harness, seat, head rest and mirrors before driving. Always wear the seat belt/shoulder harness when driving. Before long trips and at every fuel tank fill, check the oil, coolant, transmission, and brake fluid levels. Also ensure the fire extinguisher, first aid kit, triangles or cones, spare tire and jack are present and in good condition. Always perform a "walk-around" before driving the vehicle, especially if you need to engage the reverse gear. Look for small objects and pedestrians that you normally wouldn't see when looking from inside the vehicle. Always use a spotter when available. Review the use of hand signals with the spotter before maneuvering the vehicle. Turn the headlights on while driving, even in the daytime, to make sure others see you. 	
2. Driving from the parking lot or driveway into a traffic lane	<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles Mechanical Failure (Engine) 	<ul style="list-style-type: none"> Always look over your shoulder when pulling out into traffic. Use slow, easy acceleration. Avoid "jack-rabbit" starts. 	
3. General Driving	<ul style="list-style-type: none"> Mechanical Failure/Collision (Loss of Steering Control) Collision with pedestrians, vehicles, or property 	<ul style="list-style-type: none"> Maintain the hand position at 9 and 3 to avoid loss of control of the steering wheel. Steering loss can happen at any time from potholes, debris, and distractions. Obey all traffic laws, signals and signs. Always use turn signals when turning or changing lanes. Use the "SMOG" technique (Signal, Mirror check, look Over Shoulder and Go) when making a lane change or entering traffic. 	
4. Approaching Intersections	<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles 	<ul style="list-style-type: none"> 30-40 feet back from the limit line of the intersection is the Point of No Return (PONR). 	

Job Loss Analysis

<p>4. Approaching Intersections (continued)</p>	<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles Chain reaction collision from "rear-enders" "Car Jacking" or vehicle theft while stopped Mechanical Failure (Brakes and Transmission) 	<ul style="list-style-type: none"> If the signal light is still green when passing the PONR, then look Left-Right-Left (L-R-L) and proceed through the intersection provided there are no red-light runners from cross traffic. This can be done even if the light turns yellow after passing the PONR. If the signal light turns yellow before the PONR, then ease slowly to a stop, 15' before the limit line or the vehicle in front. Always plan to have 15' of space cushion in front of the vehicle when stopping at intersections. This will break up a "chain reaction". Keep the 15' space cushion in front of the vehicle. Carjackers look for those potential victims who continually trap themselves. Use slow, gradual deceleration techniques. Avoid hard braking.
<p>5. Normal Driving between intersections and on long stretches of highway</p>	<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles Collision from "tail-gators" 	<ul style="list-style-type: none"> Maintain a 15 second Eye Lead Time. Avoid the fixed stare by keeping your eyes moving (every 5 to 8 seconds). Scan the mirrors every 5-8 seconds to maintain the circle of awareness. Maintain a space cushion of "4 seconds" in front of the vehicle. Avoid driving in other driver's blind spots. Maintain a space cushion to the sides of the vehicle. Increase the following distance to the front of the vehicle Make a convenient lane change to the right and allow the "tailgater" to pass.
<p>6. Stopping and Parking</p>	<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles, run away vehicle 	<ul style="list-style-type: none"> Always obey signs and use signals when in a parking lot. Do not exceed 15 mph in a parking lot. Plan ahead and try to "pull-through" to avoid backing at the end of the visit. If unable to "pull-through" then back into a perimeter slot or pull into a slot well away from everyone else to maintain a space cushion when leaving. Get Out and Look (GOAL) before backing into or from a parking slot. Check parking area for obstructions/hazards when there is limited line of sight, blind spots from the vehicle or other site features or vehicles already parked on the site Always put transmission into park and turn off ignition when parking. Always set the parking brake and use wheel chocks when parked.
<p>FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.</p>		

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 5
WORK ACTIVITY (Description):			
FENCE INSTALLATION / REMOVAL			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Mike Burnell	Senior Field Technician	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Puncture Resistant, Crush Resistant (75lbs), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant & Puncture Resistant <input checked="" type="checkbox"/> Other—Specify: Snake Chaps, Knee Pads
REMINDER: Complete an SPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Arriving on site	Vehicular accident - Getting hit by or hitting another car	Follow maximum 5 mph speed limits on site. (LSA 2) Use a spotter when reversing. Ensure spotter is equipped with air horn. Honk horn before reversing.	
2. Tailgate H&S meeting	Getting struck by a moving vehicle	Conduct H&S meeting in a safe location (away from traffic). (LSA 2) Inspect H&S meeting location for bees and other biological risks.	
	Inattention to safety meeting	Do not use cellphone during H&S meeting. Engage all crew in meeting.	
3. Site walk through and inspecting work area	Slip, trips, and falls – Twisted/broken ankle	Review General Site Activity JLA before performing this step. Watch your foot placement and avoid gopher holes and un-even terrains. Take smaller steps than normal.	
	Biological hazard	Wear snake chaps.	
4. Install/Remove fence material	Back strains	Bend with knees, keeping your back straight.	
	Splinters / punctures from wooden stakes and metal mesh	Use the provided level 4 puncture resistant gloves. Inspect wooden stakes for splinters and do not use if damaged. Use stake holding tool. Avoid handling mesh by edges.	
	Slip trips and falls	Watch your foot placement and avoid gopher holes and uneven terrain.	
	Biological Hazards	Inspect bushes and vegetation for biological hazard when working near them.	
	Puncture to knee from debris	Inspect ground before kneeling. Wear knee pads.	
5. Rolling wire fencing material	Back strains	Do not lift any more that 50 pounds at a time. Always lift with legs, not back, when moving bundles.	
	Hand injury from sharp wire ends	Wear provided level 5 cut resistant and puncture resistant gloves.	
6. Install/Remove plastic bucket	Back strains	Bend with knees, keeping your back straight.	
	Slips, trips, falls	Watch your foot placement and avoid gopher holes and uneven terrain.	
	Knee injury	Inspect ground before kneeling. Wear knee pads.	
	Hand injury, scrape and cuts	Use the provided level 4 puncture resistant gloves.	
7. Cleaning work area and packing tools	Back strains	Bend with knees, keeping your back straight.	
	Hand injury, scrape and cuts	Wear level 3 cut resistant gloves.	
8. Departing site	Vehicular accident - Getting struck/ hit by another car	Follow maximum 5 mph speed limits on site. (LSA 2) Use a spotter when reversing. Ensure spotter is equipped with air horn. Honk horn when reversing.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Job Loss Analysis

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

- ¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- ² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 29
WORK ACTIVITY (Description):			
GENERAL SITE ACTIVITY The purpose of this JLA is to focus employee attention on common hazards that occur in the work environment and keeping awareness high to mitigate these hazards. This JLA must be used in conjunction with a task and/or site-specific JLA. This JLA shall be reviewed anytime working conditions and or tasks change at the job site.			
EQUIPMENT necessary to mitigate hazards associated with this work activity: Traffic Control Devices, Hand Tools, Wheel Chocks, Signage (authorized personnel only, hard hat area, hearing protection must be worn)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Cole Grover	Project Scientist	Sean Gultinan	SSH&E Program Manager
Laina Cole	LPS Steward	Andrew Whitman	Senior Staff Scientist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input checked="" type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long Sleeve Protection Required	<input checked="" type="checkbox"/> Gloves—Type: Nitrile and Level 3 Cut, Puncture, Impact Resistant <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. General Site Activities - preparing work area & traffic control (does not cover working in the street, review Traffic Control JSA)	Traffic Hazards, being struck by /striking third party, contractor vehicle, or client property	<ul style="list-style-type: none"> • Park field vehicles in safe/low traffic area where tailgate safety meeting/paperwork can be conducted safely. (LSA2) • All contractor/consultant parked onsite vehicles must be chocked. • Use crosswalk when crossing the street. (LSA2) • Notify attendant and/or owner/manager of work activities/location. • Verbally communicate with third party workers/co-workers the hazards and PPE requirements. • Ensure work area and equipment are within a defined exclusion zone using traffic barricades and/or delineators with caution tape. Use company vehicle to block access. (LSA2) • If vehicles do not pose contact hazard with personnel or equipment, leave opening for vehicle traffic to move across site. (LSA2) • Wear high visibility clothing such as a reflective vest or reflective suit (Class II Minimum) • Wear level 3 cut, puncture, impact resistant gloves for setup of traffic control equipment. • Continually watch out for vehicle traffic and plan a safe pathway to move clear of vehicles if they approach within 15 feet. (LSA2) • Where vehicles may pass work area, post traffic watch to warn employee of dangerous vehicle movement (vehicle backing up or driving towards work area). (LSA2) • Traffic watch to establish warning signal in case equipment operation generates noise levels preventing verbal warning (when operator cannot hear you >2 feet away using a conversational voice). • Apply 360 degree check and Smith driving techniques using a spotter prior to backing or moving vehicle around site. Ensure spotter is equipped with air horn. • Use vehicle 4-way flashers and beacon if available when moving vehicle around high vehicle and pedestrian traffic areas. (LSA2) 	
	Unauthorized Access, third party entering work area gets hurt or causes injury or accident	<ul style="list-style-type: none"> • Prevent unauthorized access by delineating the work area. Utilize physical barriers such as caution tape, fencing and barricades, vehicle to prevent inadvertent entry. • For construction work, post signage to indicate work area (hard hat area, authorized personnel only, hearing protection, double hearing protection, Prop 65). 	
	Potential for crime and aggressive individuals causing injury or worse	<ul style="list-style-type: none"> • Stay aware of surroundings; avoid confrontation. Do not leave doors of vehicle unlocked at any time. Have phone readily available to contact 911 in the event of emergency. Prepare to leave the area if personal safety appears at risk. 	
2. General Site Activities - employee dress, prepared for work	Loose Clothing & Jewelry, Long Hair, Keys Attached to Belt Clip Caught by Rotating Equipment or Other Obstructions - loss of or tear in appendage from being caught	<ul style="list-style-type: none"> • No loose sleeves, tails, ties, frills, lapels, cuffs, or other loose clothing shall be worn around machinery where it might entangle. • Where there is a risk of injury from long hair, jewelry, or keys attached to a belt clip entangling in moving parts of machinery or getting caught on ladders or other fixed structures, employees shall confine, secure or remove the item to eliminate the hazard. 	

3. General Site Activities - accesses, walking the site	Slips, Trips, Falls - strains, broken bones, twisted joints	<ul style="list-style-type: none"> • Rocks, dirt mounds and dead vegetation are significant trip hazards, know body position and avoid stepping on rocks or dragging your feet around soft dirt, remove long vegetation from work zone. • Keep work area dry and free of excess materials, debris. • Remove trip hazards; keep materials organized/out of walkways • Stay aware of footing and walk, do not run. • Do not step backwards without first looking at footing surface. • If freezing temperatures, watch for ice slip hazards.
4. General Site Activities - climbing ladders / equipment / buildings	Mounting - Dismounting Equipment - strains, broken bones, twisted joints, and falls	<ul style="list-style-type: none"> • Do not carry anything in hands while climbing/descending ladder. Carry keys in pocket (not attached to belt loop) and tools in tool belt. • Use 3 points of contact when climbing up/down ladders/equipment. • Always face equipment/ladders when mounting and dismounting. • Make sure ladders are secure before using. • Fall protection required when working at heights greater than 6 feet, includes ladders. (LSA 1) • Identify stable surface before stepping down on it (never jump off).
5. General Site Activities - environmental working conditions	Heat/Cold Stress - serious injury to body, possible death	<ul style="list-style-type: none"> • In hot environment, drink small amounts of water often, about 8 oz every 15 minutes. Start drinking water 1-2 hours before work begins. • Take breaks based on heat index rule: For temperatures < 85 F, work continuously. For temps 85 F to 95 F, work 40 minutes followed by 20 minutes rest. For temps > 95 F, work for 20 min followed by 40 minutes rest. Additional cooling measures required (i.e., water dampened clothing, cool mist). • In hot environments wear light clothing, sunscreen for exposed skin • In hot environments take rest breaks in covered, shaded area. If no shade, idle vehicle with AC on. • Cold environment consume non-caffeine sweet liquids, heavy meals • Cold environment wear layered clothing to adjust. • Review HASP Attachment for Heat and Cold Stress Protocols • Adjust work schedule to avoid heat/cold stress.
6. General Site Activities - biological hazards	Biological Hazards: Insects, Snakes, Wildlife, Vegetation, Feces, Blood	<ul style="list-style-type: none"> • Inspect work areas upon arrival to site to identify hazards • Use insect repellent as necessary. Evaluate risk. If uncertain contract professional exterminator (i.e., beehive). • Open enclosures slowly to react against biological hazards. • Stay alert and out of contact distance from biological hazards. • Use universal precautions if encounter blood on site. If needles are observed, isolate the hazard using a cone or delineator and notify the property manager. Notify employees to avoid hazard. Do not touch. • In areas with large amounts of rodent or bird feces, do not work in or create dust. Requires professional abatement; call PM. • Identify poisonous plants - poison sumac, stinging nettles, poison ivy, or poison oak. • Wear snake chaps if in area known for snakes. Use walking stick to probe tall grass before entering.
7. General Site Activities - impact hazards	Body, arm, leg, hand, foot impact line of fire hazards	<ul style="list-style-type: none"> • Evaluate work area to ensure worker body is not in a line-of-fire hazard. STOP WORK and address with PM if risk is present to isolate or eliminate impact hazard.
	Hand hazards from being caught, crushed, cut, pinched, or damaged.	<ul style="list-style-type: none"> • Use Hands Program when more than one person working around the same equipment. • No fixed blades are to be used by staff or subcontractors. • Before you put your hands somewhere, ask yourself, "Can my hands be cut, crushed, torn or damaged by what I am about to do?" • Use Level 3 cut, puncture, impact resistant gloves for general work, and chemical resistant over glove for impacted soil, water and hazardous materials, heavy over-leather for hot/cold. Cut protection must be worn at all times while working. • Use tool to take the place of hand when cutting, impact or crushing hazards are present. Keep hands 6 inches clear of any pinch hazard
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 3
WORK ACTIVITY (Description):			
OVERSIGHT OF GEOPHYSICAL INVESTIGATION / SUBSURFACE UTILITY DESIGNATING			
This JLA covers the hazards associated with performing utility designating services at various sites.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Traffic Control Devices (as needed/job specific), Hand Tools, Wheel Chocks, Signage (authorized personnel only, hard hat area, no smoking), Spray Paint, Metal Detector, Ground Penetrating Radar (GPR)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
James Foster	Utility Designation Technician	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection (as needed) <input checked="" type="checkbox"/> Safety Shoes— Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long Sleeve Protection Required	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut, Puncture, Impact Resistant <input type="checkbox"/> Other—Specify:
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Loading and Unloading Equipment	<ul style="list-style-type: none"> Ergonomics – back strains while lifting, bending, twisting, squatting causing chronic back pain 	<ul style="list-style-type: none"> Lift with knees, not your back. Keep load close to body about waist height. Keep back straight while lifting, moving, and placing. Do not carry more than 50 LBs per person. Ask for help to carry heavy items and or awkward items Remove only one piece of equipment at a time. Do not carry equipment when entering or exiting vehicles. Plan your route. 	
	<ul style="list-style-type: none"> Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> Inspect work area for tripping and slipping hazards (water, mud, ropes, equipment, etc.) and remove obstacles or move away from work area. Maintain 3-point contact when climbing onto or down from equipment, trailers and trucks. 	
2. Operating utility designating equipment	<ul style="list-style-type: none"> Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> Rocks, dirt mounds and dead but moist vegetation are significant trip hazards. Know body position and avoid stepping on rocks or dragging your feet around soft dirt. Remove long vegetation from work zone. Watch where walking. Stop to take reading. Do not multi-task. Keep work area dry and free of excess materials, debris. Remove all trip hazards by keeping materials/objects organized and out of walkways. Stay aware of footing. Walk, do not run. 	
	<ul style="list-style-type: none"> Struck by vehicles – serious injury or fatality 	<ul style="list-style-type: none"> Set up exclusion zone around work area being surveyed. Face oncoming traffic at all times. Watch traffic keeping eye contact with the drivers. Move away from exclusion zone edge if driver is not paying attention. Request “second set of eyes” provided by Stantec Supervisor to act as safety alert. Agree on warning mechanism. Plan escape route. 	
3. Marking Utilities	<ul style="list-style-type: none"> Being sprayed in the face with marking paint – damage to eyes Chemical exposure to propellant acute headache or dizziness Possible fire from propellant in spray can 	<ul style="list-style-type: none"> Keep cap on spray paint can while mixing. Never point spray paint at someone or your own face. Use in well vented area. Never spray paint on open flame or electrical arch or ignition source, e.g. spent cigarettes. (LSA 6) 	
4. Lifting manhole covers or grate inlets	<ul style="list-style-type: none"> Ergonomics – back, neck, shoulder strains while lifting, bending, twisting, squatting 	<ul style="list-style-type: none"> Lift with knees, not your back. Keep load close to body about waist height. Keep back straight while lifting, moving, and placing. Use a magnetic manhole cover lifting system or other lifting system to safely lift manhole covers and grate inlets. 	

Job Loss Analysis

4. Lifting manhole covers or grate inlets (continued)	<ul style="list-style-type: none"> • Impact – potential of crushing fingers and hands 	<ul style="list-style-type: none"> • Before putting hands somewhere, ask yourself, "Can my hands be cut, crushed, torn or damaged by what I am about to do?" • Hand protection must be worn at all times while working. <ul style="list-style-type: none"> ○ Wear Level 3 cut, puncture, impact resistant gloves for general work. ○ Wear chemical resistant over glove for impacted soil, water and hazardous materials. ○ Wear heavy over-leather for hot/cold. • Never place fingers or hands beneath manhole/grate cover and rim of vault.
	<ul style="list-style-type: none"> • Biological – Insects, Snakes, Wildlife, Vegetation, Feces, Blood 	<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. • Use tool (pry bar) and visual inspection to explore well vault before reaching in with gloved hand.
5. Designating electric facilities	<ul style="list-style-type: none"> • Possible shock, arc flash exposure, or electrocution 	<ul style="list-style-type: none"> • Verify with utility locator electrical safety precautions for attaching to live electrical equipment. • Maintain 10-foot clearance from live electrical equipment (transformers, switches, sub-panels, motors, etc.). Only utility owner representatives are qualified to access this equipment. • Confirm utility locator is connecting a current only to ground potential or neutral conductor. Never apply current to live electrical equipment. (LSA 5)
6. Perform Site Cleanup	<ul style="list-style-type: none"> • Ergonomics – back strains while lifting, bending, twisting, squatting 	<ul style="list-style-type: none"> • Lift with knees, not your back. • Keep load close to body about waist height. • Keep back straight while lifting, moving, and placing. • Do not carry more than 50 LBs per person. • Ask for help to carry heavy items and or awkward items. • Remove only one piece of equipment at a time. • Do not carry equipment when entering or exiting vehicles
	<ul style="list-style-type: none"> • Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> • Inspect work area for tripping and slipping hazards (water, mud, ropes, equipment, etc.) and remove obstacles. • Maintain 3-point contact when climbing onto or down from equipment, trailers and trucks.
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

- ¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- ² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 21
WORK ACTIVITY (Description):			
GROUNDWATER SAMPLING			
This JLA covers routine sampling of groundwater wells on property. Working in remote area around livestock requires the use of the Monitoring and Gauging JLA			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Impact Driver, Magnets rated for various lids, Manhole Dolly for 2x2 and larger lids, Screwdriver, Ratchet, Pry Bar, Groundwater Sampling Equipment and Sample Containers			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Gary DeCarlo	QM Manager	Sean Guitinan	SSH&E Program Manager
David Daniels	Project Geologist	Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required	<input checked="" type="checkbox"/> Gloves—Type: Level 5 Cut Resistant with listed puncture & impact resistance (general work) Level 3 cut & listed puncture resistance (sampling) <input type="checkbox"/> Other—Specify:
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Maneuvering Vehicle/Trailer On Site	• Collision with person/vehicle/property - damage to property, person being hit and run over	<ul style="list-style-type: none"> • Communicate with other onsite personnel where work is taking place and how long it will take. • Visually assess pathway before relocating vehicle to ensure safe route before moving. • Clear communication between spotter and driver, including agreed position for spotter and hand signals for left, right, move and stop. Ensure spotter is equipped with air horn. • Wear traffic vest. • Driver must stop vehicle if spotter is not visible. 	
	• Items falling from truck	<ul style="list-style-type: none"> • Drive with the tailgate closed whenever possible. If the tailgate must remain open, strap down any loose items. • Conduct a walk around of the vehicle before moving to another location. Secure loose items 	
2. Handling Equipment/Removing - Replacing Well Lids	• Over Exertion- Lifting Heavy Equipment with "Butts Up" (Legs straight and back bent)	<ul style="list-style-type: none"> • Get help with objects that are too heavy (>50 lbs.) or awkward for one person to lift. Use mechanical means such as pallet jack, wheelbarrow, dolly to transport heavy materials • Keep aware of body positioning and use lifting techniques: Bend at knees, lift with legs, keep a straight back, tighten core muscles, keep load within 6 inches of body. 	
	• Coming into contact with sharp and/or heavy objects	<ul style="list-style-type: none"> • Wear cut resistant level 3 gloves and safety shoes as defined by ANSI Z41. 	
	• Coming into Contact with objects Slips/Trips/Falls - cuts, broken bones, damage ligaments/tendons	<ul style="list-style-type: none"> • If lid is removable, store as close as possible. Clear of potential walkways to avoid tripping hazards. Consider placing lid underneath tailgate of truck if feasible. Replace well lid as soon as you complete task to eliminate a potential trip hazard. 	
	• Exposure to Contaminants, biological hazards	<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. Use tool (screw driver) and visual inspection to explore well vault before reaching in with gloved hand. 	
	• Heavy Well Lids/Covers - crushed or amputated fingers/toes; "Twist and Shout" leading to Back Strain	<ul style="list-style-type: none"> • Wear cut resistant under and Nitrile over gloves. • Keep hands/fingers away from raised covers. • Use hand tools to initially loosen and hold well vault lids; do not place fingers under lid • Use Heavyweight steel dolly to remove oversized well vaults to prevent injuries to fingers, toes and long term back injuries/soreness. Use weight-rated magnets to remove smaller well vault lids. 	
3. Purging Wells	• Splash hazard when gauging wells	<ul style="list-style-type: none"> • Safety glasses with side shields must be worn at all times. • Nitrile/cut resistant gloves must be worn while handling the bailer. 	
	• Exposure to Vapors and Airborne particulates	<ul style="list-style-type: none"> • Check for the presence of NAPL. Call PM if NAPL is encountered for instructions on how to proceed. • If NAPL is confirmed and the PM decides to proceed with work on the well, consult the NAPL bailing JLA. 	
		<ul style="list-style-type: none"> • Keep lids closed on poly tanks and drums as much as possible. 	

Job Loss Analysis

4. Collecting Groundwater Samples	• Contact with sharp objects (broken Sampling Bottles) - cuts	<ul style="list-style-type: none"> • Use clear glass VOAs. • Visually inspect each glass bottle for defects prior to use. • Place VOA in holding device and then tighten on lid • Wear cut-resistant gloves under Nitrile gloves while handling glass sample bottles.
	• Sample bottle falling and breaking - exposure to impacted water, cuts	<ul style="list-style-type: none"> • Large sample containers must be secured in event it tips. Place large sample container in plastic tote or box to secure while opening, filling and closing container. • Review Sample Packing SOP before packing and shipping samples.
5. Locking Well Caps	• Exposure to Contaminants, biological hazards, cuts to hands	<ul style="list-style-type: none"> • Wear cut resistant level 3 under and Nitrile over gloves. • The well cap must be effectively sealing well and be locked.
		<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. Use tool (screw driver) and visual inspection to explore well vault before reaching in with gloved hand.
6. Cleaning Up and Departing the Site	• Slips, trips and falls - results in broken bones and torn ligaments/tendons	<ul style="list-style-type: none"> • Check that well covers are secure upon departure, and that all tools and bailing equipment are removed from the site. • Walk around site and vehicle to perform a visual inspection before demobilization.
	• Demobilization	• Review Driving JLA
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

- ¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- ² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 3
WORK ACTIVITY (Description):			
TRUCK LIFT GATE OPERATION			
This JLA addresses the hazards involved with operating a standard motorized lift gate on the back of work truck.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
General equipment, drums or tools loaded on the lift gate, lift gate.			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Mike Burnell	O&M Manager	Peter Petro	HSE Director
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes— Puncture Resistant, Electrical Hazard, Crush/Impact Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Nitrile & Level 4 Cut Resistance <input type="checkbox"/> Other—Specify:
REMINDER: Complete an SPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Load equipment, drums or material on lift gate	<ul style="list-style-type: none"> • Back strain while lifting and loading items • Trip slip and fall • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Lift with your knees and within your body green zone (knees to chest, maximum 2" to 3" from body). • Do not twist your body while carrying. • When practical, move the truck closer to items to be loaded. • If loading items from the ground on wheels (drums on dolly, generator, wheelbarrow etc.), ensure lift gate is lowered to the ground. • If loading bags and hand-carried items, raise lift gate to waist level. • If loading from the truck's side, ensure lift gate is up all the way. • Plan your route. Make sure no tools or trip hazards are in your route. • Wear level 4 cut resistant gloves. 	
2. Securing load before lifting it	<ul style="list-style-type: none"> • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • If moving load to make extra room, do not put hand in-between two items (between drums, etc.) • Wear level 4 cut resistant gloves. 	
3. Lifting load	<ul style="list-style-type: none"> • Items falling of lift gate • Operator falling from lift gate • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Do not overload lift gate. If not familiar with gate capacity, stop and ask other workers. Do not proceed until gate capacity is confirmed. • Keep all tools and load at least 6" away from all edges of lift gate even if load is very light. • Keep feet and body at least 6" away from edge of lift gate. • Do not hold onto any moving parts of the lift gate. • Do not put hand in the line of fire of moving gate parts. • Hold nearest side gate of the truck is recommended. 	
4. Moving load out of lift gate	<ul style="list-style-type: none"> • Falling off the lift gate • Back strains • Trip slip and falls • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Keep feet and body at least 6" away from edge of lift gate. • Bend with knees. Keep back straight. • Watch foot placement. • Do not walk over chains securing the sides of the lift gate. • If unloading to work zone, ensure lift gate is flush to ground level. • If unloading to truck's bed, ensure lift gate is flush to truck's level. • Wear level 4 cut resistant gloves. 	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 19
WORK ACTIVITY (Description):			
PORTABLE GAS OR DIESEL POWERED GENERATORS			
This JLA covers the hazards associated with using portable gasoline- or diesel-powered generators to provide electrical power for electric tools, lights, pumps, etc.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Hand Cart, Wheelbarrow, Generator, Fuel Container, GFCI Tester			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
George Gonzalez	Field Specialist	Sean Guiltinan	SSH&E Program Manager
Andrew Yonkofski	Scientist II	Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input checked="" type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Electrical Hazard, Crush/Impact Resistant 75lbs.	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant & Fuel-Resistant Over-gloves <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Unloading/Loading Generator	• Back injury from “Elbows Out”, “Butt’s Up,” “Twist and Shout,” and/or “Overreaching”.	• Do not lift anything >50 lbs. or awkward shape without assistance. Bend and lift using legs/arms, not your back. Tighten your stomach muscles before the lift. Do not twist.	
	• Injury from pinch points	• Lift and move generator using handle grips on generator.	
	• Burns from hot surfaces	• Use lift gate, hand cart, or wheel barrel to lift and move generator, when available.	
	• Unsecured equipment - spill of fuel, damage to generator/other equipment	• Position hands and feet out of pinch and crush points when moving generator. Wear level 3 cut resistant gloves. Impact resistant/cut resistant or leather over gloves recommended.	
2. Fueling Generator	• Back strain from “Butts Up” or “Elbows Out”	• Allow generator to cool prior to moving it.	
	• Eye or skin contact from fuel	• Ensure that generator is secured against movement or jostling prior to transport.	
	• Explosion and fire	• Position generator at waist height if possible. Bend using legs, not at the back. Keep back straight, core engaged and arms in front of body.	
	• Inhaling fumes from fuel	• Wear safety glasses and fuel-resistant over-gloves.	
	• Explosion and fire	• Pour slowly.	
		• Ensure the spout is tightened to the can.	
		• TURN OFF GENERATOR AND ALLOW TO COOL. Never fuel generator while it is operating or in an overheated condition. (LSA 6)	
		• Fuel generator in open air environment to avoid fumes.	
		• Ensure any spilled fuel has dried or is wiped off prior to starting generator.	
		• Do not store fuel containers in the vicinity of the generator. Ensure that all materials are clear of the exhaust. Heat from the exhaust can get very hot and cause some materials to melt and/or burn.	
	• Inspect fuel lines for leakage. Keep generator properly maintained.		
	• Keep a 20 lb fire extinguisher next to the generator. (LSA 6)		
	• Electrical shock		
	• Ensure generator is properly grounded. Consult Owner’s Manual prior to operation. (LSA 8)		
	• Dry your hands before touching generator.		
	• If you must use a generator when it is wet outside, protect the generator from moisture. Do NOT operate generator indoors.		
	• Ensure generator is equipped with a Ground Fault Circuit Interrupter (GFCI). Test GFCI to ensure electrical power is interrupted. (LSA 8)		
	• If GFCI is not built into the generator, plug a GFCI tester into the generator followed by the electrical cord & test operation. (LSA 8)		
	• Check that the entire length of each electrical cord is free of cuts or tears and that the plug is not altered prior to connecting to generator.		
	• Protect electrical cords from getting pinched or crushed.		
	• Make sure the wattage rating for each cord exceeds the total wattage of all appliances connected to it.		

Job Loss Analysis

3. Starting Generator	• Back strain from "Twist and Shout"	• If generator is equipped with a pull cord to start, ensure adequate spacing between generator and body to pull cord directly towards body. Keep back straight and do not twist while pulling.	
	• Inhaling fumes from exhaust	• Never operate generator indoors or in confined areas without proper ventilation.	
	• Hearing damage: temporary or permanent hearing loss	• Wear hearing protection (plugs, caps, muff NRR > 28) to protect ears if operating generator exceeds 85 db. Post hearing protection signs to warn public and workers • Do not stand/work within 3 feet of operating generator except when starting/shutting down.	
4. Operating Generator	• Burns from hot surfaces	• Wear level three cut resistant gloves AND heavy duty over gloves. • Avoid contact with generator while it is in operation.	
	• Explosion and fire	• Do not store fuel containers in the vicinity of the generator. • Inspect fuel lines for leakage. Keep generator properly maintained. • Do not operate generator in the vicinity of combustible materials (paper, rags, clothing). (LSA 6)	
	• Electrical shock	• Dry hands before touching generator. • If you must use a generator when it is wet outside, protect the generator from moisture. Do NOT operate generator indoors. • NEVER plug generator into an electrical wall outlet (Back feeding). • Ensure generator is equipped with a Ground Fault Circuit Interrupter (GFCI). Test GFCI to ensure electrical power is interrupted. (LSA 8) • If generator is not equipped with GFCI, plug a GFCI tester into the generator followed by the electrical cord & test operation. (LSA 8) • Check that the entire length of each electrical cord is free of cuts or tears and that the plugs are not altered prior to connecting to generator. • Protect electrical cords from getting pinched or crushed. • Make sure the wattage rating for each cord exceeds the total wattage of all appliances connected to it.	
		• Inhaling fumes from exhaust	• Never operate generator indoors or in confined areas without proper ventilation.
		• Hearing damage	• Wear ear plugs if noise from operating generator exceeds 85 db. • Do not stand/work within 3 feet of operating generator except when starting/shutting down. If noise exceeds 85 db, post hearing protection signs to warn public and workers
5. Cease Generator Operation	• Electrical shock	• Dry hands before touching generator.	
	• Equipment damage	• Turn off all appliances powered by the generator and then turn off generator.	
	• Fuel Spill	• Turn off fuel valve when generator is done operating prior to transporting.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

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² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

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Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 8
WORK ACTIVITY (Description):			
SPOTTING / MOVING EQUIPMENT			
This JLA addresses hazards associated with exclusion zones, clear traffic paths, and coordination during operation of mobile equipment and third-party vehicles. The standard Traffic Control JLA should also be used when working on public property.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Air horn			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Carl Miklich	Assistant Project Manager	Andy Nelson	Branch Manager / Senior Geologist
		Sean Gultinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Electrical Hazard, Crush/Impact Resistant 75lbs.	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant and Puncture Resistant <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Review of work area and exclusion zones	• Equipment damage and personal injury	<ul style="list-style-type: none"> • All parties must review the traffic control plan. • Review and have a clear understanding of work zones, areas of third-party traffic and safety zones for employees on foot. (LSA 2) 	
2. Moving vehicle backwards	• Property damage or personal injury	<ul style="list-style-type: none"> • Always use a spotter when moving a vehicle backwards. Determine the route to take prior to moving the vehicle. (LSA 2) • The spotter shall discuss signals with the driver ahead of time. • The spotter shall communicate by hand or radio signals with driver. • Ensure spotter is equipped with air horn • The driver shall obey signals from the spotter. 	
		<ul style="list-style-type: none"> • A separate spotter is required for each potential point of contact between the vehicle and another structure (e.g., if backing, a 2nd spotter is required if front of vehicle may contact a structure). 	
		<ul style="list-style-type: none"> • If a blind spot exists, the driver must communicate this to the spotter and not move until the spotter determines that it is safe to proceed. (LSA 2) 	
	• Property damage from vehicle hitting object due to blind spots	<ul style="list-style-type: none"> • Spotter and driver should assess for third-party traffic and pedestrians prior to moving vehicle. While spotting, both the driver and spotter should communicate with pedestrians to stay clear and stop if other vehicles approach. Ensure spotter is equipped with air horn. 	
	• Property damage or personal injury due to third-party vehicles or pedestrians entering the path of the moving vehicle.	<ul style="list-style-type: none"> • A spotter must be used if vehicle is passing underneath overhead lines, unless it has been verified there is at least 3 feet (1.0 m) of clearance between the line and top of vehicle • The spotter shall not allow vehicle to pass underneath any utility line with 1 foot (0.3 m) or less clearance. • If clearance is 3 feet (1.0 m) or less, the driver is to restrict his speed to <5 miles per hour. 	
		<ul style="list-style-type: none"> • Fatality from being hit by vehicle • Do not stand directly behind vehicle in the line of fire. (LSA 2) • Spotter shall wear a traffic vest. • Do not spot for more than one vehicle at a time. • Driver shall stop if eye contact or visual contact with spotter is lost. • Maintain eye contact with driver when vehicle is moving. Do not glance away for more than 1 second. (LSA 2) 	
<ul style="list-style-type: none"> • Electrocutation or damage from striking utility line 			
3. Repositioning Spotter	• Broken ankle from tripping	<ul style="list-style-type: none"> • Never walk backwards while spotting. • Inspect ground before walking, and avoid slopes, trip hazards and uneven ground. • Spotter must not move while vehicle is being spotted. If spotter has to reposition, spotter shall direct vehicle to stop, turn and walk to new location, then re-establish eye contact with driver and resume spotting. 	

FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

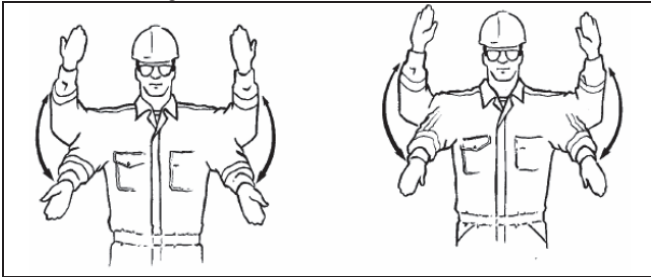
LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

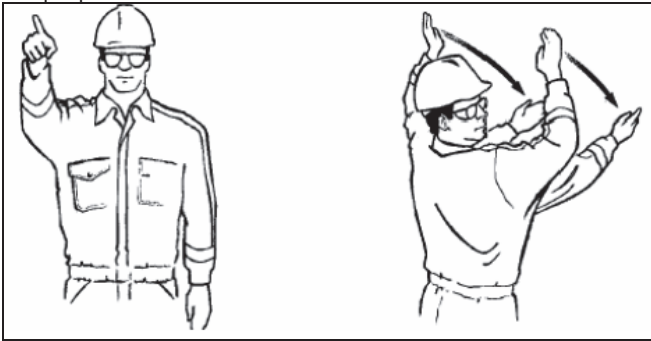
- Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
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BACK UP – Straight backward or forward



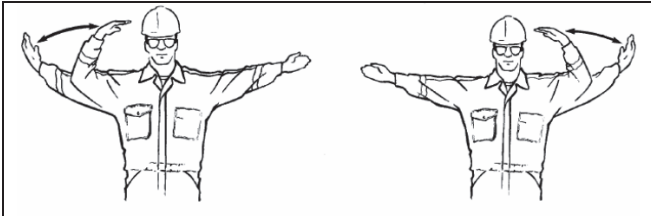
CLEAR TO LEAVE THE AREA

Show operator of equipment or vehicle it is clear of obstructions and people and is clear to leave in the direction shown.



Turn vehicle **RIGHT**

Turn the vehicle **LEFT**



STOP all movement immediately.



Distance to **STOPPING POINT**

As hands get closer together, vehicle is closer to stopping point.



Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 9
WORK ACTIVITY (Description):			
TRAFFIC CONTROL AT CLIENT SECURED SITES			
This JLA addresses hazards associated with exclusion zones and clear traffic paths and coordination during operation of mobile equipment and third party vehicles at controlled sites: refinery, terminals, bulk plants. Use the standard Traffic Control JLA when working on public property.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Two Way Radios, Traffic Delineators, Caution Tape, Sandbags or Delineator Bases (for added weight in windy conditions)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Geoffrey Waterhouse	Senior Project Geologist	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input type="checkbox"/> Reflective Vest <input type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Safety Shoes—Type:	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input type="checkbox"/> PPE Clothing—Type:	<input type="checkbox"/> Gloves—Type: <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Pre-Traffic Control Set Up Health and Safety Meeting / General Site Activities.	• Miscommunication between workers causing accident involving equipment and/or personnel injury	• All employees assigned to this task will attend a pre-construction health and safety meeting, which will include review of the traffic control plan. Clear understanding of work zones, areas of third party traffic and safety zones for employees on foot will be reviewed and understood.	
2. Observe work zones for excessive speed, and third-party vehicles	• Excessive speed leads to vehicle overturn, loss of control.	• Contact operator using handheld radio and request immediate slow down. Follow all posted controlled site speed limits. If not posted, speed limit shall be 15 mph. (LSA 2)	
	• Operator or contractor crashes into vehicles.	• Verify vehicle signal equipment is working: lights, turn signals and horns. • Stop vehicle when operator of other vehicle comes within 100 yards of operating vehicle. (LSA 2)	
	• Movement of traffic control devices from moderate / high wind conditions.	• Always bring additional weight (i.e. sand bags / delineator bases) • Estimate wind speed and direction. If wind gusts approach 25 mph, add a minimum of 24 lbs. (two delineator bases) of additional weight.	
	• Possible additional factors (pot holes, traffic speed, construction activity) that could pose additional hazards associated with lane closure.	• If additional factors identified in the field, STOP WORK. Make adjustments to lane closure/traffic control to mitigate the hazards associated with the additional factors.	
3. Driving angles and surfaces	• Vehicle roll-over and being stuck. Personnel injured in roll-over or trying to free stuck vehicle.	• Verify driving conditions on exposed soil. If soil is too soft, do not drive vehicles onto exposed soil.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

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ExxonMobil ADC
Stantec 203722941.HASP.2024

APPENDIX D
GEOGRAPHICAL BIOLOGICAL
HAZARDS INFORMATION SHEETS

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Geographical Biological Hazards – Outdoor Work Hazard by State

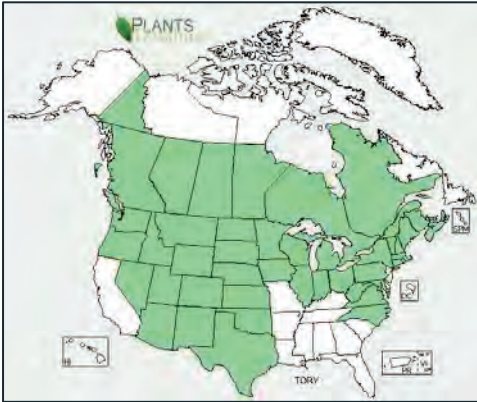
State	Poisonous Plants				Stinging Insects				Venomous Snakes				Venomous Spiders & Scorpions				Vector-Borne Diseases			Infectious Diseases
	Poison Ivy	Poison Oak	Poison Sumac	Stinging Nettles	Bees	Africanized Honey Bees ("Killer Bees")	Paper Wasps	Yellow Jackets	Fire Ants	Copperheads	Coral Snakes	Cottonmouths / Water Moccasins	Rattlesnakes	Black Widow	Brown Recluse Spider	Hobo Spider	Scorpions	Lyme / Oher Tick-Borne Diseases	West Nile Virus	
Alabama	X	X	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	
Alaska				X	X		X					X	X	X				X		
Arizona	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	X
Arkansas	X	X			X	X	X	X	X		X	X	X	X	X		X	X	X	
California		X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	X
Colorado	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Connecticut	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Delaware	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Florida	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Georgia	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Hawaii					X		X							X				X		
Idaho	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Illinois	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Indiana	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Iowa	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Kansas	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Kentucky	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Louisiana	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Maine	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Maryland	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Massachusetts	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Michigan	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Minnesota	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Mississippi	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Missouri	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	
Montana	X	X		X	X	X	X	X	X		X	X	X	X	X		X	X	X	

State	Poisonous Plants				Stinging Insects				Venomous Snakes				Venomous Spiders & Scorpions				Vector-Borne Diseases			Infectious Diseases		
	Poison Ivy	Poison Oak	Poison Sumac	Stinging Nettles	Bees	Africanized Honey Bees ("Killer Bees")	Paper Wasps	Yellow Jackets	Hornets	Fire Ants	Copperheads	Coral Snakes	Cottonmouths / Water Moccasins	Rattlesnakes	Black Widow	Brown Recluse Spider	Hobo Spider	Scorpions	Lyme / Oher Tick-Borne Diseases		West Nile Virus	Zika Virus*
Nebraska	X	X		X	X		X						X	X	X			X	X	X		
Nevada	X	X		X	X	X	X		X				X	X	X	X			X	X	X	X
New Hampshire	X	X	X	X	X		X						X	X	X				X	X	X	
New Jersey	X	X	X	X	X		X					X	X	X	X				X	X	X	
New Mexico	X	X		X	X	X	X		X				X	X	X	X			X	X	X	X
New York	X	X	X	X	X		X		X			X	X	X	X				X	X	X	
North Carolina	X	X	X	X	X		X		X			X	X	X	X				X	X	X	
North Dakota	X	X		X	X		X					X	X	X	X				X	X	X	
Ohio	X	X	X	X	X		X					X	X	X	X				X	X	X	
Oklahoma	X	X		X	X	X	X		X			X	X	X	X				X	X	X	
Oregon	X	X		X	X		X						X	X	X				X	X	X	
Pennsylvania	X	X	X	X	X		X					X	X	X	X				X	X	X	
Rhode Island	X	X	X	X	X		X					X	X	X	X				X	X	X	
South Carolina	X	X	X	X	X		X		X			X	X	X	X				X	X	X	
South Dakota	X	X		X	X		X						X	X	X				X	X	X	
Tennessee	X	X	X	X	X		X		X			X	X	X	X				X	X	X	
Texas	X	X	X	X	X		X		X			X	X	X	X				X	X	X	X
Utah	X	X		X	X		X						X	X	X				X	X	X	X
Vermont	X	X	X	X	X		X						X	X	X				X	X	X	
Virginia	X	X	X	X	X		X		X			X	X	X	X				X	X	X	
Washington	X	X		X	X		X						X	X	X				X	X	X	
West Virginia	X	X	X	X	X		X					X	X	X	X				X	X	X	
Wisconsin	X	X	X	X	X		X						X	X	X				X	X	X	
Wyoming	X	X		X	X		X						X	X	X				X	X	X	

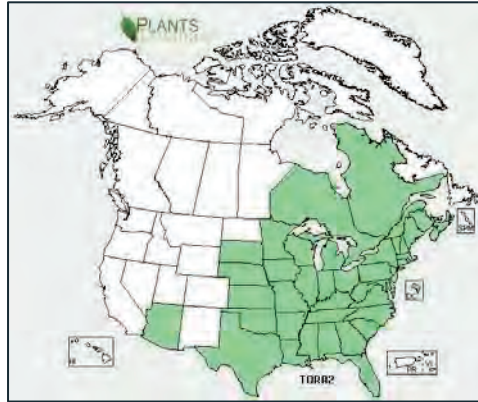
Poison Ivy

"Leaves of three, let it be. Berries white, poisonous sight."

Western Poison Ivy Distribution



Eastern Poison Ivy Distribution



■ Present □ Absent/Unreported

Characteristics

- > Features clusters of 3 leaflets, two leaves on each side and one leaf in the center.
- > Each group of 3 leaflets grows on its own stem, which connects to the main vine.
- > Each group of 3 leaflets grows on alternate sides of the stem, not directly across from one another.
- > Leaves are almond-shaped, glossy, hairless, have smooth edges (not toothed), and range from 3/4" – 4" long
- > Leaves are reddish in spring, green in summer, and yellow, orange, or red in fall.
- > Grows as a shrub, climbing vine or trailing vine, often along riverbanks.
- > Lacks thorns.
- > May have white berries.
- > The leaf is not poisonous. Rather, the plant oil found in the sap causes the rash. This poisonous sap covers a poison ivy leaf that is broken, bruised, or damaged.

Symptoms

- > Itchy skin.
- > Redness or red streaks.
- > Small itchy bumps (hives).
- > Swelling.
- > An outbreak of small or large blisters, often forming streaks or lines.
- > Crusting skin (after blisters burst).
- > Rash can appear within hours or may take 1-2 weeks to appear after exposure.
- > The rash will only occur where the plant oil has touched the skin, so a person with poison ivy cannot spread it on the body by scratching. It may seem like the rash is spreading if it appears over time instead of all at once. However, this is either because the plant oil is absorbed at different rates in different parts of the body or because of repeated exposure to contaminated objects or plant oil trapped under the fingernails. Even if blisters break, the fluid in the blisters is not plant oil and cannot further spread the rash.
- > Poison ivy rashes are not contagious and do not spread from person to person. Even if the person touches the rash or the fluids in the blisters, the person cannot get the rash. The person has to touch the plant oil to get the rash.
- > It is possible to pick up the rash from plant oil that may have stuck to clothing, pets, garden tools, and other items that have come in contact with these plants. The plant oil lingers (sometimes for years) on virtually any surface until it's washed off with water or rubbing alcohol.

Tips for Prevention

- > Learn what poison ivy plants look like so you can avoid them.
- > If you think you may work around poison oak, wear gloves, long sleeves, socks, and long pants tucked into boots
- > Wash your tools and gloves regularly when working around poisonous plants.
- > If you come in contact with poisonous plant, wash your skin in cool water as soon as possible to remove the plant oil and reduce the risk of rash.
- > If you know you will come into contact with poison ivy, use "Ivy Block," a topical, over the counter barrier product.

Treatment

- > If you come in contact with poison ivy, wash your skin, including under fingernails, in cool water as soon as possible to reduce the risk of a rash and to prevent further spread.
- > If rash and blisters appear, avoid scratching the blisters, which can cause infection.
- > Relieve the itch with a wet compress or by soaking in cool water.
- > Over-the-counter skin medications, such as calamine lotion can also ease the itchiness
- > If creams, lotions, or bathing do not stop the itching, antihistamines may be helpful.
- > The rash, blisters, and itch normally disappear in several weeks without any treatment.
- > Antibiotic ointment prevents broken blisters from becoming infected.
- > See a doctor:
 - if you have a temperature over 100 F
 - if there is pus, soft yellow scabs, odor, or tenderness on the rash
 - if the itching gets worse or keeps you awake at night
 - if the rash spreads to your eyes, mouth, genital area, or covers more than one-fourth of your skin area
- > **Call 911 or go to an emergency room if:**
 - > Someone is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.
 - > Someone has been exposed to the smoke of a burning plant.

Poison Ivy Pictures

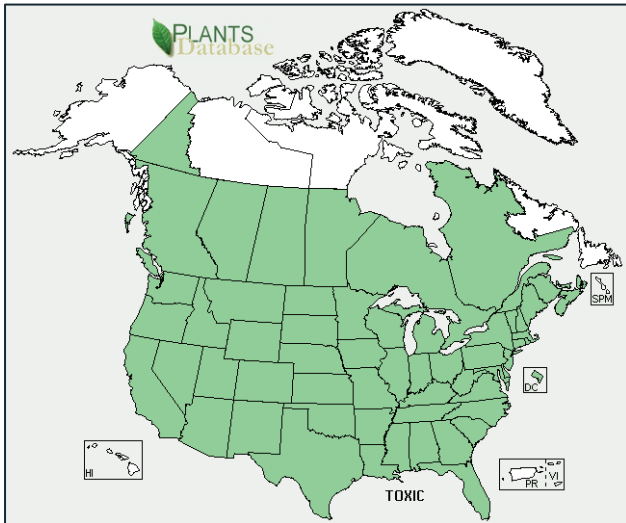


Poison Ivy Rash



Poison Oak

"Leaves of three, let it be. Berries white, poisonous sight."



■ Present □ Absent

Characteristics

- > Grows as either a shrub (1.6 – 13' tall), a climbing vine into tree canopies, or a trailing vine as ground cover.
- > Grows primarily in dry areas at elevations below 5,000 feet.
- > Leaves grow in clusters of 3 leaflets, 1 ½ – 4 inches long, with scalloped, toothed, or lobed edges.
- > Leaves resemble lobed leaves of a true oak, though Pacific poison oak leaves tend to be more glossy.
- > Stems are light brown or gray.
- > In spring, leaves are bright green and white flowers may form. In summer, leaves turn yellow-green to reddish and fertilized flowers develop into white/tan berries. In fall, leaves turn bright red or pink. In winter, the stems are leafless and may have occasional black marks where its milky sap may have oozed and dried.

Symptoms

- > Itchy skin
- > Redness or red streaks
- > Small itchy bumps (hives)
- > Swelling
- > An outbreak of small or large blisters, often forming streaks or lines
- > Crusting skin (after blisters burst)
- > Rash can appear within hours or may take 1 to 2 weeks to appear after exposure
- > The worst symptoms are often seen during days 4 to 7. The rash may last for 1 to 3 weeks.
- > The rash will only occur where the plant oil has touched the skin, so a person with poison sumac can't spread it on the body by scratching. It may seem like the rash is spreading if it appears over time instead of all at once. However, this is either because the plant oil is absorbed at different rates in different parts of the body or because of repeated exposure to contaminated objects or plant oil trapped under the fingernails. Even if blisters break, the fluid in the blisters is not plant oil and cannot further spread the rash.
- > Poison oak rashes are not contagious and do not spread from person to person. Even if the person touches the rash or the fluids in the blisters, the person cannot get the rash. The person has to touch the plant oil to get rash.
- > It is possible to pick up the rash from plant oil that may have stuck to clothing, pets, garden tools, and other items that have come in contact with these plants. The plant oil lingers (sometimes for years) on virtually any surface until it's washed off with water or rubbing alcohol.

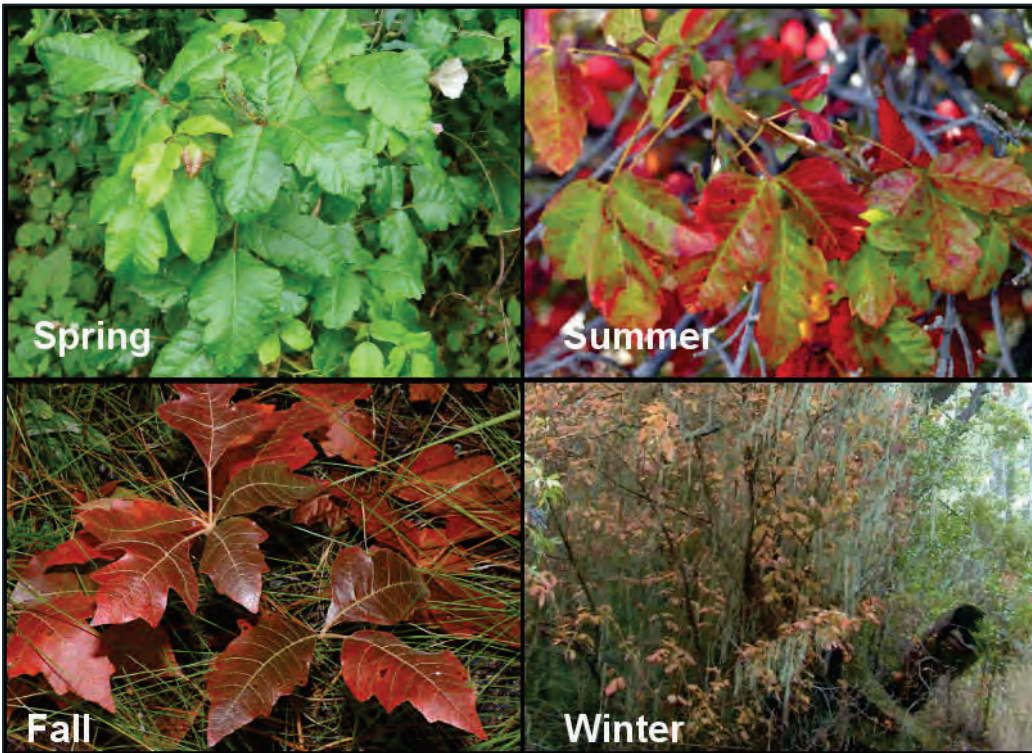
Tips for Prevention

- > Learn what poison oak plants look like so you can avoid them.
- > If you think you may work around poison oak, wear gloves, long sleeves, socks, and long pants tucked into boots.
- > Wash clothing, gloves, and shoes with soap and hot water. The plant oils can linger on them.
- > Wash tools and other objects with a dilute bleach solution or rubbing alcohol.
- > If you come in contact with poisonous plant, wash your skin in cool water as soon as possible to remove the plant oil and reduce the risk of rash.
- > Over the counter skin products such as Ivy Block lotion can be applied beforehand to reduce the risk of a rash.

Treatment

- > If you come in contact with poison oak, wash your skin, including under fingernails, in cool water as soon as possible to reduce the risk of a rash and to prevent further spread.
- > If rash and blisters appear, avoid scratching the blisters, which can cause infection.
- > Relieve the itch with a wet compress or by soaking in cool water.
- > Over-the-counter skin medications, such as calamine lotion can also ease the itchiness.
- > If creams, lotions, or bathing do not stop the itching, antihistamines may be helpful.
- > The rash, blisters, and itch normally disappear in several weeks without any treatment.
- > Antibiotic ointment prevents broken blisters from becoming infected.
- > See a doctor:
 - if you have a temperature over 100 °F
 - if there is pus, soft yellow scabs, odor, or tenderness on the rash
 - if the itching gets worse or keeps you awake at night
 - if the rash spreads to your eyes, mouth, genital area, or covers more than one-fourth of your skin area
- > **Call 911 or go to an emergency room if:**
 - > Someone is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.
 - > Someone has been exposed to the smoke of a burning plant.

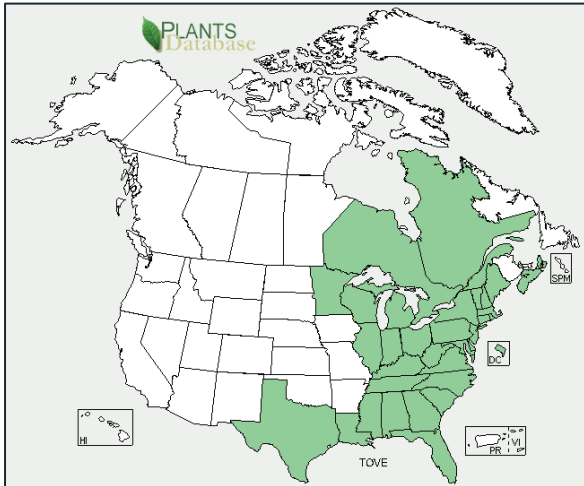
Poison Oak Pictures



Poison Oak Rash



Poison Sumac



Characteristics

- > Grows as a woody shrub or small tree ranging from 5 to 20 feet tall.
- > Same family as poison ivy, but larger.
- > Each sumac stem is red and consist of 7 to 13 leaves arranged in pairs.
- > Leaves are 2 to 4 inches in length, oval to oblong in shape, and are hairless with smooth edges
- > In spring/summer leaves are green accompanied by green flowers and yellow-white berries. In fall, leaves have vibrant hues including yellow, scarlet, and purple.
- > Poison sumac sap envelopes all of the plant, so simply brushing up against the leaves can result in a reaction.
- > Poison sumac is **not** very common. It only grows in very wet areas, such as along rivers, swamp edges and wet woods.

Symptoms

- > Itchy skin.
- > Redness or red streaks.
- > Small itchy bumps (hives).
- > Swelling.
- > An outbreak of small or large blisters, often forming streaks or lines.
- > Crusting skin (after blisters burst).
- > Rash can appear within hours or may take 1 to 2 weeks to appear after exposure.
- > The worst symptoms are often seen during days 4 to 7. The rash may last for 1 to 3 weeks.
- > The rash will only occur where the plant oil has touched the skin, so a person with poison sumac cannot spread it on the body by scratching. It may seem like the rash is spreading if it appears over time instead of all at once. However, this is either because the plant oil is absorbed at different rates in different parts of the body or because of repeated exposure to contaminated objects or plant oil trapped under the fingernails. Even if blisters break, the fluid in the blisters is not plant oil and cannot further spread the rash.
- > Poison sumac rashes are not contagious and do not spread from person to person. Even if the person touches the rash or the fluids in the blisters, the person cannot get the rash. The person has to touch plant oil to get rash.
- > It is possible to pick up the rash from plant oil that may have stuck to clothing, pets, garden tools, and other items that have come in contact with these plants. The plant oil lingers (sometimes for years) on virtually any surface until it's washed off with water or rubbing alcohol.

Tips for Prevention

- > Learn what poison sumac plants look like so you can avoid them.
- > If you think you may be working around poison sumac, wear gloves, long sleeves, and long pants tucked into boots with socks.
- > Wash clothing, gloves, and shoes with soap and hot water. The plant oils can linger on them.
- > Wash tools and other objects with a dilute bleach solution or rubbing alcohol.
- > If you come in contact with poisonous plant, wash your skin in cool water as soon as possible to remove the plant oil and reduce the risk of rash.
- > Over the counter skin products such as Ivy Block lotion can be applied beforehand to reduce the risk of a rash.

Treatment

- > If you come in contact with poison sumac, wash your skin, including under fingernails, in cool water as soon as possible to reduce the risk of a rash and to prevent further spread.
- > If rash and blisters appear, avoid scratching the blisters, which can cause infection.
- > Relieve the itch with a wet compress or by soaking in cool water.
- > Over-the-counter skin medications, such as calamine lotion can also ease the itchiness
- > If creams, lotions, or bathing do not stop the itching, antihistamines may be helpful.
- > The rash, blisters, and itch normally disappear in several weeks without any treatment.
- > Antibiotic ointment prevents broken blisters from becoming infected.
- > See a doctor:
 - if you have a temperature over 100 °F.
 - if there is pus, soft yellow scabs, odor, or tenderness on the rash.
 - if the itching gets worse or keeps you awake at night.
 - if the rash spreads to your eyes, mouth, genital area, or covers more than one-fourth of your skin area.
- **Call 911 or go to an emergency room if:**
 - > Someone is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.
 - > Someone has been exposed to the smoke of a burning plant.

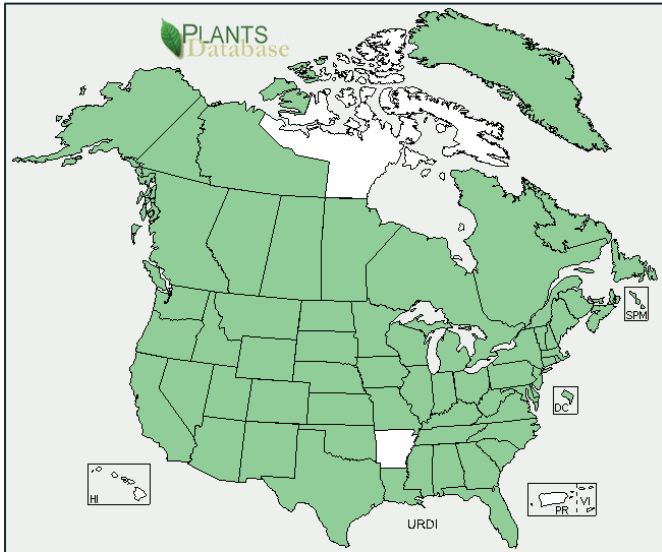
Poison Sumac Pictures



Poison Sumac Rash



Stinging Nettles



■ Present □ Absent/Unreported

Characteristics

- > Grows in dense clumps, often forming large colonies.
- > Plant typically grows 3 to 7 feet tall in the summer and dies down to the ground in winter.
- > Stems are slender, grow 3 to 6 ½ feet tall, and are covered with bristly stinging hairs.
- > Leaves are triangular or heart-shaped that decrease in size as they go up the slender stem.
- > Leaves are soft, thin, and bright to dark green in color. They are 1 to 6 inches long and 1 to 4 inches wide, with saw-toothed edges and linear bumps.
- > Has greenish-white flower clusters and small, oval-shaped seed-like fruit that is yellow to grayish-tan.
- > Stinging hairs on the stems and lower leaf surface cause a painful stinging sensation upon contact with skin.

Symptoms

- > Reddish swelling
- > Itching
- > Numbness
- > Symptoms are typically brief but can be quite uncomfortable.
- > Symptoms last for a few minutes to a few hours, and then resolve on their own.

Tips for Prevention

- > Learn what stinging nettle plants look like so you can avoid them.
- > If you come into contact with stinging nettles, immediately wash affected area with soap and water.

Treatment

- > **Call 911 or go to an emergency room if:**
 - You have a severe allergic reaction evidenced by:
 - Body-wide hives or rash
 - Difficulty breathing
 - Dizziness
 - Swelling of the tongue
 - You have a history of severe allergic reactions to bee venom (since stinging nettle and certain species of bees produce formic acid as a defense mechanism). Left untreated, a severe inflammatory reaction could lead to anaphylaxis, which can be **fatal**.
- > Topical remedies include:
 - Hydrocortisone cream or spray
 - Create a paste of baking soda and water
 - Calamine lotion
- > Antihistamines may help to counter nettle stings.

Stinging Nettles Pictures







Stinging Nettles Rash



Bees

Characteristics

	Western Honey Bee	Bumblebee
		
Distribution	Bees are found throughout the United States.	
Colors	Amber to brown translucent alternating with black stripes. Pattern and color varies depending on strain/breed.	Yellow with black stripes, sometimes with red tail, to dark.
Coat	Furry (short hair).	Furry (long hair).
Size	1.3 cm (0.51 inch)	2.5 cm (0.98 inch)
Legs	Not generally visible while flying. In contrast, wasps' long legs will dangle below its body when in flight.	
Wings	At rest, bee wings will stick out to the sides. In contrast, wasp wings will rest close to its body when at rest.	
Waist	Bee waist will be just as big as the rest of its body. In contrast, wasp waist is very slender.	
Behavior	Gentle.	Gentle.
Food	Pollen and Nectar from flowers.	
Sting	Bee stings once and then dies. Barbed stinger continues pumping venom.	Stinger retracts. Can sting multiple times.
Lives in	Large colonies of beeswax honeycombs hang vertically, parallel to each other, and usually have a single entrance. Hives can be found in caves, rock cavities, hollow tree cavities, in trees, under roof eaves.	Small cavities in the soil.
		
Colony Size	Thousands of insects at a time.	
Activity	Bees are most abundant in the warmer months. Bees are most active during daytime, when temperatures are warmer. Bees are least active in late evening or early morning when temperatures are cooler.	

Symptoms

- > Bee stings cause redness, swelling, pain, and itching.

Tips for Prevention

- > Wear light-colored, smooth-finished clothing. Bees tend to attack dark colors, including clothing, hair, etc.
- > Avoid wearing cologne, perfume, or perfumed soaps, shampoos, and deodorants.
- > Wear clothing to cover as much of the body as possible.
- > Wear clean clothing and bathe daily. (Sweat may anger bees.)
- > Avoid flowering plants when possible.
- > Be aware of your surroundings, keep an eye out for bees, and learn what bees look like so you can avoid them.
- > Examine area for the presence of bees prior to using noisy power equipment which may provoke bees
- > **When preparing to inspect worksite for bees or nests, always wear** long-sleeved shirt, long pants tied at the ankles or tucked into socks or boots, socks, and shoes. A hat covered with netting to protect the face and gloves to protect the hands and wrists are recommended.
- > Bees are generally very docile and will not sting if left alone. Do not step on, touch, or annoy. If provoked, bee will sting to defend nest or itself.
- > Look for bees entering or leaving an area, which may indicate presence of a nest.
 - Aerial nests – in trees or under building eaves
 - Ground nests – holes in the ground
 - Nests within cavities – wall voids, cracks in stone walls, holes in water meter, tree cavities, sheds
- > Listen for the hum of an active bee colony.
- > Be extra careful when moving junk that has been lying around.
- > Be alert for bees that are acting strangely. Bees will warn a potential threat with preliminary defensive behavior before going into a full-fledged attack. For example, they may fly at your face or buzz around over your head.
- > **IF YOU LOCATE A BEEHIVE** - Never disturb a swarm or colony of bees. Contact a professional pest control company for assistance.
- > **IF YOU SEE A SWARM OF BEES** focusing on one place for 48 hours or more, it is likely they have selected it as their new nest. Call a professional pest control company to have it removed before they become defensive.
- > If a single bee is flying around, remain calm and slowly retreat from area. Swatting at the bee may cause it to sting.
- > If several bees attack at once:
 - RUN AWAY as fast as possible to get away from them!
 - The average human runs faster than the average bee flies.
 - Bees release a chemical when they sting, which may attract other bees.
 - Do not try to retrieve belongings nearby.
 - Do not flail your arms as it may further anger them.
 - Do not freeze in place or “play possum.”
 - Protect eyes and face by covering your head and face with a towel, coat, or pull your shirt up over your face. Stings on your chest are far less serious than those to facial area.
 - GET INDOORS QUICKLY! Find shelter in a building or car with windows and doors closed.
 - If no shelter, run through bushes or high weeds. A shaded area is better than open area to get away.
 - Although it may be tempting, DO NOT JUMP INTO WATER! Bees will wait for you to come up for air.
- > If a bee comes inside your vehicle, stay calm, leave the bee alone, slowly stop car and open all windows and doors.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
- > Wear a medical identification bracelet or necklace stating their allergy.










Treatment

If a worker is stung by a bee, wasp, or hornet:

- > Have someone stay with the worker to be sure that they do not have an allergic reaction.
- > Wash the site of injection with soap and water.
- > Remove stinger by raking a credit card or fingernail across stinger. Do not pinch stinger, it will push more venom into wound. Do not scratch the sting as this may increase swelling, itching, and risk of infection.
- > If worker exhibits conditions of anaphylactic shock (see below), **CALL 911 IMMEDIATELY!**
 - Dizziness
 - Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face, or neck.
 - Choking sensation, difficulty breathing or wheezing or blueness in the lips and skin
 - Nausea, vomiting, and loss of consciousness
 - Drop in blood pressure
- > If no sign of shock, apply alcohol wipe, topical sting relief, and cold pack to reduce swelling.
- > OTC pain relievers can manage pain. Antihistamine can reduce itching. Take all medications as directed to avoid potential side effects (stomach irritation or drowsiness). If worker has medical issues, do not take antihistamine.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

Paper Wasps, Yellow Jackets, Hornets

Characteristics

	Wasp	Yellow Jacket	Hornet
			
Distribution	Widely distributed throughout United States, Canada, southern Europe, tropical Asia, Australia, New Zealand, South Africa, North and South America.	Common worldwide. Particularly abundant in southeastern United States.	Widely distributed throughout North America, Asia, Africa, Europe, Russia.
Colors	Black insect with yellow markings.	Most have alternating black and yellow body segments, although some may exhibit white and black coloration.	Body is brown with yellow markings. Wings are reddish-orange. Queens are more reddish than brown.
Coat	No hair.	Very little hair on thorax and abdomen.	Very little hair on thorax and abdomen.
Body	Three distinct body segments (head, thorax, abdomen), very slender waist, hard exoskeleton, 6 jointed legs, 2 antennae. Body is slender, more compact than Yellow Jacket.	Three distinct body segments (head, thorax, abdomen), slender waist (in contrast to bee whose abdomen is rounded), hard exoskeleton, 6 jointed legs, 2 antennae.	Three distinct body segments (head, thorax, abdomen), larger waist than wasp or yellow jacket, hard exoskeleton, 6 jointed legs, 2 antennae.
Size	0.7 to 1.0 inch	0.39 to 0.62 inch	1 to 1.5 inches
Legs	Long hind legs dangle below body when in flight.	Lack the bee's expanded hind leg used for carrying pollen.	Lack the bee's expanded hind leg used for carrying pollen.
Wings	4 transparent wings. At rest, wings will rest at its sides.	Elongated wings are as long as the body and fold laterally when at rest.	Elongated wings are as long as the body and fold laterally when at rest.
Waist	Very slender waist.	Very slender waist.	Slender waist.
Behavior	Most will not sting if left alone. Do not step on, touch, or annoy. If provoked, a wasp will sting in defense of itself or its nest.	Most will not sting if left alone. Do not step on, touch, or annoy. If provoked, a yellow jacket will sting in defense of itself or its nest.	Most will not sting if left alone. Do not step on, touch, or annoy. Hornets rarely sting unless colony is seriously disturbed.
Food	Preys on live insects. Also eats nectar.	Scavenges dead insects, sugars and proteins (meats).	Preys on live insects. Also eats tree sap.
Sting	Capable of inflicting multiple, painful stings.	Capable of inflicting multiple, painful stings.	Capable of inflicting multiple, painful stings.
Lives in	Open, umbrella-shaped paper combs are tan or gray. Nests are typically suspended from eaves, tree branches, and other protected locations, such as wood piles or open pipes. Some species (digger wasps) dig nests in the mud evidenced by multiple ground holes.	Enclosed paper combs are tan or gray. Nests are typically found in underground cavities including rodent burrows, hollow trees, compost piles, wood piles. Sometimes nests are suspended in trees, under building eaves, in attics, sheds, crawl spaces, wall voids, other enclosed areas.	Massive, enclosed paper combs are tan or gray, and resemble a large football. Nests are typically found in hollow trees, shrubs, under eaves in barns, shed, attics, and wall voids of buildings. Nests built in wall voids may emit noticeable stench. Nest entrance is frequently 6 feet or more above ground.
			
			
Colony Size	Usually less than 100.	Between 100 to thousands of insects.	Between 200 to 400 insects.
Activity	Wasps, Yellow Jackets and Hornets are most abundant in the warmer months. Wasps, Yellow Jackets and Hornets are most active during daytime, when temperatures are warmer. Wasps, Yellow Jackets and Hornets are least active in late evening or early morning when temperatures are cooler.		

Symptoms

- > Insect stings cause redness, swelling, pain, and itching.
- > If worker exhibits any of the conditions listed below, **CALL 911 IMMEDIATELY!**
 - Dizziness
 - Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face, or neck.
 - Choking sensation, difficulty breathing or wheezing
 - Blueness in the lips and skin
 - Nausea, vomiting, and loss of consciousness
 - Drop in blood pressure

Tips for Prevention

- > Wear light-colored, smooth-finished clothing. Avoid dark or brightly colored clothing.
- > Avoid perfumed soaps, shampoos, and deodorants. Do not wear cologne or perfume.
- > Wear clothing to cover as much of the body as possible.
- > Avoid flowering plants when possible.
- > Keep work areas clean of discarded food, especially meat and sugary substances. Cover all food and dispose of wastes in covered containers.
- > Remain calm and still if a single stinging insect is flying around. Swatting an insect may cause it to sting.
- > Before using string trimmers, lawn mowers, or other loud, vibrating equipment, care should be taken to check for wasps, yellow jackets, or hornets.
- > Most wasps, yellow jackets, and hornets will not sting if left alone. Do not step on, touch, or annoy. If provoked, they will vigorously defend their nest or themselves.
- > Learn what wasps, yellow jackets, and hornets and their nests look like so you can avoid them.
- > **IF YOU LOCATE A NEST** – Never disturb a swarm or colony of wasps! Contact a professional pest control company for assistance.
 - It is generally not advisable to attempt control of stinging insects during the daytime because adults are active and may attack in defense of the nest.
 - The best time to control stinging insects is after dark when foraging adults have returned to their nests.
 - Late evening or early morning treatments are preferred since these insects are generally less active at cooler temperatures.
- > If wasps, yellow jackets, or hornets are disturbed, appear aggravated, or if you disturb a nest:
 - Remain calm
 - Retreat slowly and calmly from the area
 - Walk away with hands covering the face to protect more sensitive body areas.
 - Walk toward dense vegetation or enter a vehicle or building to avoid stinging insects.
 - Do not panic or make sudden movements. Quick movements such as fleeing in terror or swatting at them will only agitate them more and attract more stinging insects.
- > If a stinging insect comes inside your vehicle, carefully slow the vehicle and open all windows allowing the insects to escape. If insect does not escape through windows, carefully stop the vehicle on the side of the road and exit, being careful to avoid traffic. Open all doors to allow the insects to exit the vehicle.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
- > Wear a medical identification bracelet or necklace stating their allergy

Treatment

If a worker is stung by a wasp, yellow jacket, or hornet:

- > Have someone stay with the worker to be sure that they do not have an allergic reaction.
- > Wash the site of injection with soap and water.
- > Do not scratch the sting as this may increase swelling, itching, and risk of infection.
- > If worker exhibits conditions of severe allergic reaction or anaphylactic shock (see below), administer Epi-Pen as soon as symptoms begin. Then **CALL 911 IMMEDIATELY!**
 - Dizziness
 - Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face, or neck.
 - Choking sensation, difficulty breathing or wheezing
 - Blueness in the lips and skin
 - Nausea, vomiting, and loss of consciousness
 - Drop in blood pressure
- > If no sign of shock, apply alcohol wipe, topical sting relief, and cold pack to reduce swelling.

- > Over-the-counter pain relievers, such as ibuprofen, can manage pain. Antihistamine can reduce itching. Take all medications as directed to avoid potential side effects, such as stomach irritation or drowsiness. If worker has medical issues, do not take antihistamine.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.
- > Recovery from most stings is rapid and occurs within several days.

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Distribution

Rattlesnakes are found in almost every part of the continental United States, but are especially common in the southwest.

Characteristics

- > There are many species of rattlesnakes in the US that vary significantly in size, territory, markings, & temperament.
- > They range in size from the 1-foot long ridge-nosed rattlesnake to the 5-8 foot long eastern diamondback.
- > Rattlesnakes have:
 - large, relatively heavy bodies
 - triangle-shaped heads with a distinct “neck” between head and body
 - a characteristic “rattle” found at the tip of the tail
 - a “pit” on each side of the head, which is a heat-sensitive organ for locating prey
 - Elliptical pupils (Cat-eyes)
 - Venomous bites which may be fatal if not treated promptly.
- > Rattlesnakes may be found in most work habitats including grasslands, scrub brush, rocky hills, deserts, swamplands, meadows, and beaches.
- > Rattlesnakes live and hide:
 - Under rocks, boulders, fallen logs, bushes
 - Near rocky outcroppings and ledges
 - Rock piles, wood piles, and fallen structures
 - Fields with lots of small animals
 - Anywhere where there are few people about
 - Sunning themselves on rocks or in the middle of a trail on a warm day
- > Rattlesnakes rarely bite unless provoked or threatened, and if treated promptly, the bites are rarely fatal.
- > Rattlesnakes tend to avoid wide-open spaces where they cannot hide from predators and will generally avoid humans if they are aware of their approach.
- > All snakes will bite when threatened or surprised, but most will usually avoid people if possible and only bite as a last resort.
- > Rattlesnakes do not seek people out – generally, people who are bitten have had the misfortune of stumbling upon and startling an unsuspecting rattlesnake or have attempted to handle one.
- > When rattlesnakes sense a threat, some species protect themselves with camouflage coloration to blend in with their surroundings and others are good at silent escape.
- > Rattlesnakes use their rattles or tails as a warning when they feel threatened.
- > If threatening rattle fails to send the threat running, rattlesnakes will strike to defend themselves.
- > If startled, the snake may go straight to the attack, but they can only strike from a coiled position.
- > They can accurately strike at up to one-third their body length.
- > Rattlesnakes are capable swimmers.
- > Rattlesnakes are not active in cold weather. Since they are cold-blooded, they rely on their surroundings to provide heat. To keep from freezing, rattlesnakes congregate in dens and form swarming balls with their bodies.
- > Snake venom can be fatal if not treated promptly. Transport victim to emergency room immediately.

Symptoms

Rattlesnake bites include a pair of puncture marks. Signs and symptoms listed below usually begin immediately:

- | | | |
|------------------------|------------------------|------------------------------|
| > swelling | > tiredness | > destruction of skin tissue |
| > pain at site of bite | > shock | > skin color changes |
| > weakness | > difficulty breathing | > bleeding from wound |
| > paralysis | > blurred vision | > low blood pressure |
| > tingling, numbness | > eyelid drooping | > weak pulse |
| > thirst | > nausea, vomiting | > rapid pulse |

Tips for Prevention

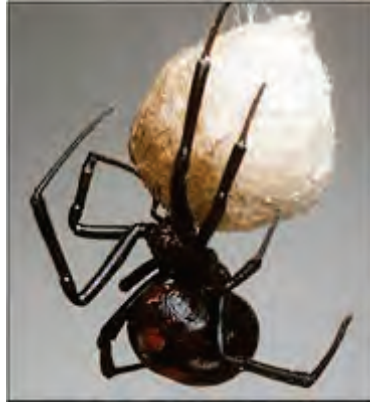
- > Wear over-the-ankle boots, loose-fitting long pants, and snake chaps.
- > Do not handle snakes! Respect snakes and leave them alone. Most snakebites occur when someone tries to kill, pick up, tease, or harass a snake. The best way to avoid a bite is to leave snakes alone.
- > Never play with or tease snakes! Remain at a safe distance more than two snake body lengths away. Most snakes can strike and hit targets at a distance of half their length.
- > Do not handle a “dead” snake. It may only be injured, stunned, or playing dead. A freshly killed snake can inject venom several hours after death.
- > Do not step or put your hands where you cannot see, especially in crevices of rocks, woodpiles, and deep grass.
- > Tap ahead of you with a walking stick before entering an area where you cannot see your feet. Check crevices of rock or woodpiles using a stick or flashlight first. Snakes will try to avoid you if given enough warning.
- > Use a stick to sweep or prod around blind areas at low levels, especially warm areas around vibrating equipment.
- > Avoid tall grass, weeds, and heavy underbrush where snakes may hide during the day. Stick to well-used trails.
- > Step ON logs and rocks, never next to their ledges. Check out stumps or logs before sitting down.
- > Be careful when stepping over doorsteps. Snakes like to crawl along building edges.
- > Be aware of peak movement times. Snakes are most active in warmer temperatures regardless of season.
- > Install outdoor lighting for work areas if working after dark.
- > Always carry a flashlight and wear boots when walking after dark.
- > If you see a venomous reptile, it is probably just “passing through.” However, if you are concerned about a dangerous animal, seek professional assistance in removing it.
- > Never grab “sticks” or “branches” while swimming in lakes and rivers. Rattlesnakes can swim.
- > Be aware that venomous snakes are not confined to rural areas. They have been found near urban areas, in river or lakeside parks, and at golf courses.

Treatment

If a worker is bitten by a venomous snake:

- > Keep the victim calm, rested and warm, reassuring him/her that bites can be effectively treated in an emergency room. This will help lower heart rate, slowing the spread of the venom.
- > Allow bite to bleed freely for 15–30 seconds before cleansing with soap and water. Wipe with hydrogen peroxide.
- > Splint or otherwise immobilize any bitten limbs.
- > Keep the affected area below heart level to reduce the flow of venom.
- > Remove any rings, watches, or constricting items because the affected area may swell.
- > If signs of shock (such as paleness, clammy skin, shallow breathing, sweating), lay the person flat, raise the feet about a foot, and cover victim with blanket.
- > **CALL 911** if the person has collapsed or is not breathing,
- > **CALL 911** to transport victim by ambulance if nearest Emergency Room is more than 1 hour away,
- > **Transport the victim IMMEDIATELY** by private vehicle if nearest Emergency Room is less than 1 hour away
- > If (and only if) the victim is more than 1 hour away from a medical facility, place a lightly constricting band (that admits one finger beneath it) 2-4 inches above the bite to prevent the systemic spread of the venom.
- > If possible, call ahead to the emergency room so antivenin can be ready when the person arrives.
- > If possible, get a description of the snake. Do NOT waste time hunting for the snake. Do NOT risk another bite by getting too close. Identification is helpful, but not necessary.
- > Do NOT attempt to catch the snake.
- > Do NOT allow the person to become over-exerted. If necessary, carry the person to safety.
- > Do NOT raise the site of the bite above the level of the person's heart.
- > Do NOT apply a tourniquet.
- > Do NOT apply cold compresses to a snakebite.
- > Do NOT cut into a snakebite with a knife or razor.
- > Do NOT try to suck out the venom by mouth.
- > Do NOT give the person anything by mouth, including stimulants or pain meds, unless a doctor tells you to do so.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information

Black Widows



Distribution

Black widow spiders are found throughout North America, but are most common in the southern and western areas of the United States.

Characteristics

- > Adult female black widow spiders have a shiny black body, slender black legs, and a red or orange mark in the shape of an hourglass on the underside of the large, round abdomen. The hourglass color may range from yellowish to various shades of orange or red.
- > Adult females are about 1/2-inch long, not including the legs (about 1-1/2 inches when legs are spread).
- > Only adult and larger juvenile female spiders are able to bite through a person's skin and inject enough venom to cause a painful reaction.
- > Adult males do possess venom, but their fangs are too small to break human skin.
- > Adult males are about half the female's size, with smaller bodies and longer legs. The male's abdomen usually has red spots along the upper midline and white lines or bars radiating out to the sides.
- > Newly hatched spiderlings are predominately white or yellowish-white, gradually acquiring more black and varying amounts of red and white with each molt.
- > Juveniles of both sexes resemble the male and are harmless.
- > Black widow spiders and their associated webs usually are found in dark, dry, sheltered, relatively undisturbed places such as:
 - piles of wood, rubbish, or stones
 - cluttered areas in basements and crawl spaces
 - garages, sheds, barns
 - utility meter boxes
 - hollow stumps
 - outhouses
 - old animal burrows
 - culverts and water drain pipes
 - sometimes among plants
- > People are most likely to be bitten when they disturb spiders while cleaning out or picking up items in such places.
- > Spiders are usually not aggressive. Most bites occur when spider is trapped or unintentionally contacted or when humans come into direct contact with their webs that they build between objects.

Symptoms

- > Initially, the bite from a black widow spider may go unnoticed, but some people report a short stabbing pain.
- > There may be slight local swelling and two faint red spots, which are puncture points from the fangs.
- > Pain soon begins and usually progresses from the bite site to the abdomen and back. Severe cramping or rigidity may occur in the abdominal muscles. Other symptoms may include:
 - Nausea
 - Restlessness
 - Profuse perspiration
 - Increased blood pressure
 - Tremors
 - Fever
 - Difficulty breathing and speaking
- > The severity of a person's reaction to a black widow spider bite depends on the area of the body bitten, amount of venom injected, and individual's sensitivity to the venom.
- > Typically, symptoms often diminish after a day or so and gradually subside over the next 2 to 3 days.
- > **CALL 911 IMMEDIATELY** or go to an emergency room if worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past

Tips for Prevention

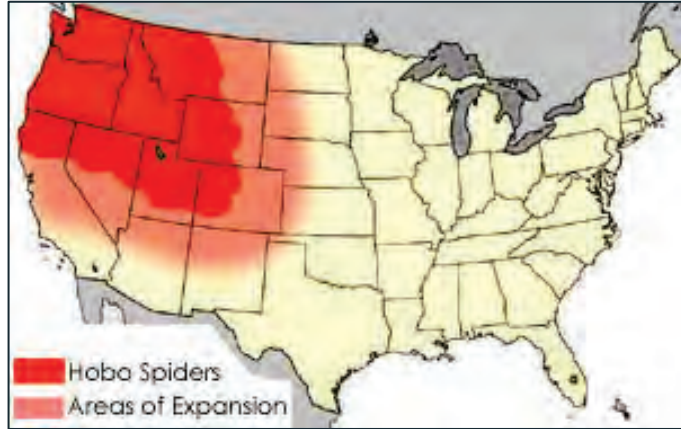
- > Always wear Gloves, Long-sleeved shirt, Long pants, and Boots when:
 - working in areas that have been undisturbed for a period of time
 - there are good hiding places for spiders
 - handling stacked or undisturbed piles of materials such as cardboard boxes, firewood, lumber, or rocks
- > Inspect and shake out clothing and shoes before getting dressed.
- > Inspect and shake out towels or equipment before use
- > INDOOR work areas:
 - Discard of boxes, lumber, and other unwanted items in basements, crawl spaces, garages, and sheds to eliminate potential hiding places
 - Store apparel and outdoor equipment in tightly closed plastic bags
 - Store any items off the floor and away from walls
 - Minimize the empty spaces between stacked materials
- > OUTDOOR work areas:
 - Remove and reduce debris and rubble
 - Trim or eliminate tall grasses
- > Keep your tetanus boosters up-to-date (every 10 years). Spider bites can become infected with tetanus spores.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
- > Wear a medical identification bracelet or necklace stating their allergy.

Treatment

If a worker is bitten by a black widow spider:

- > Remain calm.
- > Have someone stay with the worker to be sure that they do not have an allergic reaction. If worker exhibits conditions of anaphylactic shock (see below), **CALL 911 IMMEDIATELY!**
 - Dizziness
 - Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face, or neck.
 - Choking sensation, difficulty breathing or wheezing
 - Blueness in the lips and skin
 - Nausea, vomiting, and loss of consciousness
 - Drop in blood pressure
- > If no sign of shock:
 - Wash the bite area with soap and water.
 - Apply an ice pack directly to the bite area to relieve swelling and pain.
 - **Seek medical attention immediately.**
 - Most people who are bitten spend a few hours under observation by a physician but do not develop symptoms severe enough to require treatment. Serious long-term complications or death are very rare
 - A hospital stay may be recommended, particularly for small children, the elderly, or those with a heart condition or health problems.
- > Identify the type of spider if able to do so safely. Identification will aid in medical treatment.
- > Elevate bite area if possible.
- > Do not attempt to remove venom.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

Hobo Spider



Distribution

Hobo spiders are found throughout the Pacific Northwest. They can be found in Washington, Oregon, Northern California, Idaho, Northern Nevada, Montana, Wyoming, Utah, Colorado, and Southern British Columbia.

Characteristics

- > Without a microscope you may not be able to identify hobo spiders. You may have to settle for determining that your spider is NOT a hobo spider.
- > A hobo spider is brown in color and about 1/4 to 5/8 inch in body length, not including its long legs.
- > Abdomen has a pattern of yellow markings on a greyish background. Spiders with two very distinct longitudinal dark stripes on the top side of the cephalothorax (part of body where legs connect) are NOT hobo spiders.
- > Hobo spiders have uniformly colored legs. Spiders with dark rings around the legs are NOT hobo spiders.
- > Hobo spider legs have fine hairs. Spiders with legs that are shiny and lacking fine hairs are NOT hobo spiders.
- > Hobo spiders are fast runners, but unlike most spiders, are poor climbers and are rarely seen above ground level.
- > Hobo spiders construct a snare referred to as a funnel web. This trampoline-like, horizontal web that constricts back into a funnel or hole is typically found in a crack between bricks or under wood, stones, or vegetation. The spider waits in the mouth of the funnel for prey to fall onto the horizontal surface, and then it rushes out, grabs the prey, and takes it back into funnel to consume. Many other spider species build funnel webs besides hobo spiders, so this is NOT a definitive identification for a hobo spider.
- > Hobo spiders prefer habitats that have holes, cracks, or recesses to support their funnel-like webs. Although they prefer to build funnel-like webs, some will occasionally produce flat webs in less-suitable habitats.
- > Common OUTDOOR habitats include:
 - rock retaining walls
 - cracks in soil or concrete
 - around foundations, especially those with tall grass adjacent
 - window wells
 - stacks of lumber, firewood, bricks, or other materials or items
 - underneath objects on the ground surface, such as rocks, boards, debris
- > INDOORS, the hobo spider is usually found in basement or ground-floor levels of dwellings since it is a poor climber. Suitable nesting areas include:
 - spaces between boxes or other items in storage
 - window sills
 - under baseboard heaters or radiators
 - behind furniture
 - closets
- > Wandering males may occasionally become trapped in clothing, shoes, tarps, bathtubs, or other locations from which they cannot escape.
- > Hobo spiders are most commonly encountered in June through September when males wander in search of females. For this reason, most bites occur during July through September. Females tend to stay in their webs.
- > The supposed aggressiveness of the hobo spider is debatable and may be a myth. They seem to be no more aggressive than other similar spiders. When trapped, their main interest seems to be escape, not fighting back

Symptoms

- > The bite of a hobo spider is relatively painless and is reported to feel like a pin prick.
- > Within 15 minutes of the bite, numbing sensations may occur at the bite site or other areas of the body (such as the tongue), and dizziness may occur.
- > After about 1 hour, reddening around the bite begins and enlarges in area.
- > The bite site becomes hardened and swollen within about 18 hours.
- > Blistering at the bite site, severe headache, visual or auditory disturbances, weakness, and joint pains may occur within the first 36 hours. During this period, blood platelet counts will be low.
- > Within 24 to 36 hours, a discharge of fluids and blistering may occur.
- > After 2 or 3 days, the area around the wound may blacken.
- > After 7 to 10 days, the necrotic area will usually take on a characteristic elliptical shape and blood platelet counts will return to normal. Spells of nausea and sweating often persist through this time period, and headaches may persist even longer.
- > A cycle of sloughing and crusting at the ulcerated site (with the discharge of blood and serum) may continue for some time, often requiring six months or more for complete healing to occur. Reconstructive surgery may be required in serious cases.
- > **CALL 911 IMMEDIATELY** or go to an emergency room if worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.

Tips for Prevention

- > Always wear protective clothing (gloves, long-sleeved shirt, long pants, and boots) when:
 - working in storage rooms, garages, or areas that have been undisturbed for a period of time
 - handling stacked or undisturbed piles of materials such as cardboard boxes, firewood, lumber, or rocks
 - when working in the yard around tall grasses
 - there are good hiding places for spiders
- > Inspect and shake out gloves, boots, and clothing before getting dressed.
- > Inspect and shake out tarps or equipment before use.
- > Be careful when moving things out of storage areas, in particular, cardboard boxes. Hobo spiders like to hang out in the space under folded cardboard flaps. Be careful when carrying boxes as you might place your fingers on a hobo spider when you pick up the box or press a hobo spider against your body when you carry it. Remove any spiders inside boxes using a vacuum cleaner and dispose of the bag. Reseal all open edges of cardboard boxes with tape before restoring.
- > Clean up clutter and junk that is lying around. Hobo spiders love clutter and prefer to live under and between items, such as plywood, tarps and cardboard on the ground.
- > In basements or ground level floors, avoid storing clothing, shoes, tarps, and other such items on or near floor level where hobo spiders could get entangled or trapped in them.
- > When storing things in the garage, basement or attic, put them in plastic bags that close with a plastic zipper lock or twist-tie. This is especially important for things that you stick your hands and feet into, such as gloves, boots, or raingear. Tape up the edges of cardboard boxes so there is no way a spider can squeeze inside.
- > Do not stack wood against buildings. Hobo spiders like woodpiles and if they take up residence inside wood stacked next to a building, there is increased chance they will wander indoors. Move woodpiles as far from building as possible, stack it off the ground and cover it with a tarp, making the firewood less attractive to insects and the spiders that feed upon them.
- > Keep your tetanus boosters up-to-date (every 10 years). Spider bites can become infected with tetanus spores.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
 - Wear a medical identification bracelet or necklace stating their allergy.

Treatment

If a worker is bitten by a hobo spider:

- > Remain calm.
- > Have someone stay with the worker to be sure that they do not have an allergic reaction. If worker exhibits conditions of anaphylactic shock (see below), **CALL 911 IMMEDIATELY!**
- > Dizziness
- > Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face or neck.
- > Choking sensation, difficulty breathing or wheezing
- > Blueness in the lips and skin

- > Nausea, vomiting, and loss of consciousness
- > Drop in blood pressure
- > If no sign of shock:
- > Wash the bite area with soap and water.
- > Apply ice pack directly to bite area to relieve swelling and pain. Leave it on for 10 minutes and then off for 10 minutes. Repeat this process. Reduce ice contact time for individuals with circulatory problems.
- > **Transport worker to emergency room immediately.** The venom of a hobo spider can cause a severe skin lesion requiring professional medical attention. Treatment is important to reduce complications.
- > If possible, place the spider in a secure container and bring to emergency room for identification.
- > Most people who are bitten spend a few hours under observation by a physician but do not develop symptoms severe enough to require treatment. Serious long-term complications or death are very rare.
- > Elevate bite area if possible.
- > Do not attempt to remove venom.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

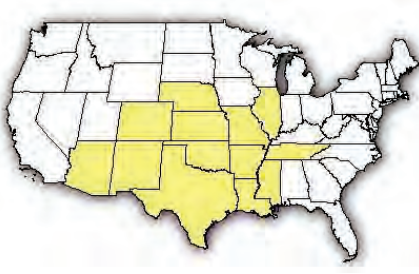
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Scorpions

Distribution

Nearly 100 species of scorpions inhabit nearly every state of the United States, except the northeast region, including: WA, OR, CA, NV, UT, AZ, ID, MT, WY, CO, NM, TX, ND, NE, KS, OK, MO, IL, AR, LA, KY, TN, MS, AL, VA, NC, SC, GA, FL.

The most widespread species, the Striped Bark Scorpion, is venomous but not considered deadly to humans. It is found most heavily concentrated in Texas radiating out to Arizona, Arkansas, Colorado, Illinois, Kansas, Louisiana, Mississippi, Missouri, Nebraska, New Mexico, Oklahoma, and Tennessee. Average length is 2.5 inches. Color is yellowish tan to brown with dark lengthwise bands.

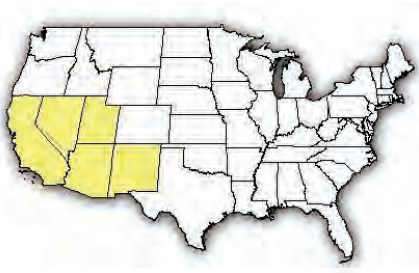


Distribution of Striped Bark Scorpion



Striped Bark Scorpion

Out of nearly 100 scorpion species found in the United States, only the Arizona Bark Scorpion possesses venom that is toxic enough to cause human fatalities. Especially widespread in most parts of Arizona, small populations inhabit southeastern California, Nevada, western New Mexico and southern Utah. Average size is 1-2 inches long. Color is golden yellow or very light brown with dark lengthwise bands. Pincers are elongated and thin, unlike other scorpions that have thick, lobster-like pedipalps.



The Arizona Bark Scorpion is the only species in the United States whose **sting may be fatal to humans. At particular risk are people with a history of allergic reactions to stings, young children, the elderly, or people in poor health. Antivenins are available.**

Characteristics

- > There are many species of rattlesnakes in the US that vary significantly in size, territory, markings, temperament.
- > They range in size from the 1-foot long ridge-nosed rattlesnake to the 5-8 foot long eastern diamondback.
- > Rattlesnakes have:
 - > large, relatively heavy bodies
 - > triangle-shaped heads with a distinct "neck" between head and body
 - > a characteristic "rattle" found at the tip of the tail
 - > a "pit" on each side of the head, which is a heat-sensitive organ for locating prey
 - > Elliptical pupils (Cat-eyes)
- > Venomous bites which may be fatal if not treated promptly.
- > Rattlesnakes may be found in most work habitats including grasslands, scrub brush, rocky hills, deserts, swamplands, meadows, and beaches.
- > Rattlesnakes live and hide:
 - > Under rocks, boulders, fallen logs, bushes
 - > Near rocky outcroppings and ledges
 - > Rock piles, wood piles, and fallen structures
 - > Fields with lots of small animals
 - > Anywhere where there are few people about
 - > Sunning themselves on rocks or in the middle of a trail on a warm day
- > Rattlesnakes rarely bite unless provoked or threatened, and if treated promptly, the bites are rarely fatal.
- > Rattlesnakes tend to avoid wide-open spaces where they cannot hide from predators and will generally avoid humans if they are aware of their approach.
- > All snakes will bite when threatened or surprised, but most will usually avoid people if possible and only bite as a last resort.

Symptoms

Onset of symptoms from scorpion sting is usually quite rapid and can last between 24-48 hours. Symptoms may include:

- > Stinging or burning sensation at injection site
 - > Positive "tap test" (extreme pain when sting site is tapped with finger)
 - > Restlessness
 - > Convulsions
 - > Roving eyes
 - > Staggering gait
 - > Thick tongue sensation
 - > Slurred speech
 - > Drooling
 - > Muscle twitches
 - > Abdominal pain / cramps
 - > Breathing difficulties
 - > Cardiac Irregularities
- > Symptoms usually subside within 48 hours, although stings from a Bark Scorpion can be life-threatening.
- > **CALL 911 IMMEDIATELY** or go to an emergency room if worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.

Tips for Prevention

- > Avoid sticking your hands or feet into places that may act as potential hiding spots for scorpions.
- > Always wear Boots, Gloves, Long-sleeved shirt, and Long pants when:
 - working in geographic regions where scorpions are known to inhabit (see distribution map on page 1)
 - working in areas that have been undisturbed for a period of time
 - there are good hiding places for scorpions
 - handling stacked or undisturbed piles of materials such as boxes, firewood, lumber, or rocks
- > Inspect and shake out clothing and shoes before getting dressed.
- > Inspect and shake out tarps, towels or equipment before use
- > Indoor work areas:
 - Discard of boxes, lumber, and other unwanted items in basements, crawl spaces, garages, and sheds to eliminate potential hiding places
 - Store apparel and outdoor equipment in tightly closed plastic bags
 - Store any items off the floor and away from walls
 - Minimize the empty spaces between stacked materials
- > Outdoor work areas:
 - Remove trash, logs, boards, stones, bricks, debris, and rubble from around building structures.
 - Keep grass closely mowed near the structure.
 - Prune bushes and overhanging tree branches away from the structure. Tree branches give scorpions a path to the roof.
 - Rest garbage containers on bricks or other items that push them up above ground level.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
 - Wear a medical identification bracelet or necklace stating their allergy.

Treatment

If a worker is bitten by a scorpion:

- > Get out of harm's way to avoid another sting.
- > If able to do so safely, identify the scorpion color and description. Identification will aid in medical treatment.
- > Do NOT try to capture the scorpion as you might get stung a second time.
- > Remain calm.
- > Have someone stay with the worker to be sure that they do not have an allergic reaction. If worker exhibits conditions of anaphylactic shock (see below), **CALL 911 IMMEDIATELY** or transport to an emergency room.
 - Dizziness
 - Swelling (hives) moves to other parts of the body, especially the tongue, breathing tubes, face or neck.
 - Difficulty breathing, choking sensation, or wheezing
 - Blueness in the lips and skin
 - Nausea, vomiting, and loss of consciousness
 - Drop in blood pressure
- > If no sign of shock:
 - Wash the bite area with soap and water. Do not attempt to remove venom.
 - Apply ice pack directly to the bite area 10 minutes on, 10 minutes off, to relieve swelling and pain. Repeat as necessary.
 - If stung on a limb (arm or leg) elevate the limb to heart level.
- > Call (888) 449-7787 for a Care Management Nurse who will assess symptoms to determine the course of action.

Lyme Disease & Other Tick-Borne Diseases

Distribution

Maps below indicate the general expected distribution of ticks that cause disease in the contiguous United States.



Western blacklegged tick (*Ixodes pacificus*)

- > Distribution: This tick is distributed along the Pacific coast of the United States.
- > Associated Diseases: Lyme disease and Anaplasmosis



Lone star tick (*Amblyomma americanum*)

- > Distribution: Primarily found in the southeastern and eastern United States.
- > Associated Diseases: Ehrlichiosis, Tularemia, and Southern Tick-Associated Rash Illness (STARI)



Blacklegged tick or "Deer Tick" (*Ixodes scapularis*)

- > Distribution: Widely distributed in the northeastern and upper midwestern United States.
- > Associated Diseases: Lyme disease, Anaplasmosis, and Babesiosis



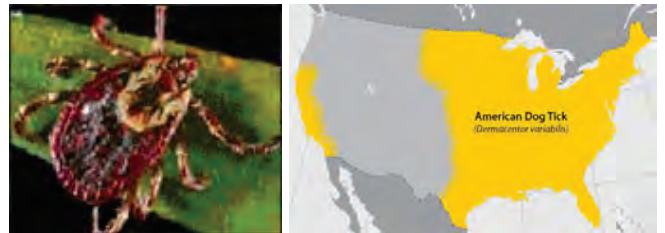
Brown dog tick (*Rhipicephalus sanguineus*)

- > Distribution: Brown dog ticks are found throughout the contiguous U.S., Hawaii, and the world.
- > Associated Diseases: Rocky Mountain Spotted Fever (southwestern U.S. and along the U.S-Mexico border)



Gulf Coast tick (*Amblyomma maculatum*)

- > Distribution: Coastal areas of the United States along the Atlantic coast and the Gulf of Mexico.
- > Associated Diseases: *Rickettsia parkeri*, a form of Spotted Fever



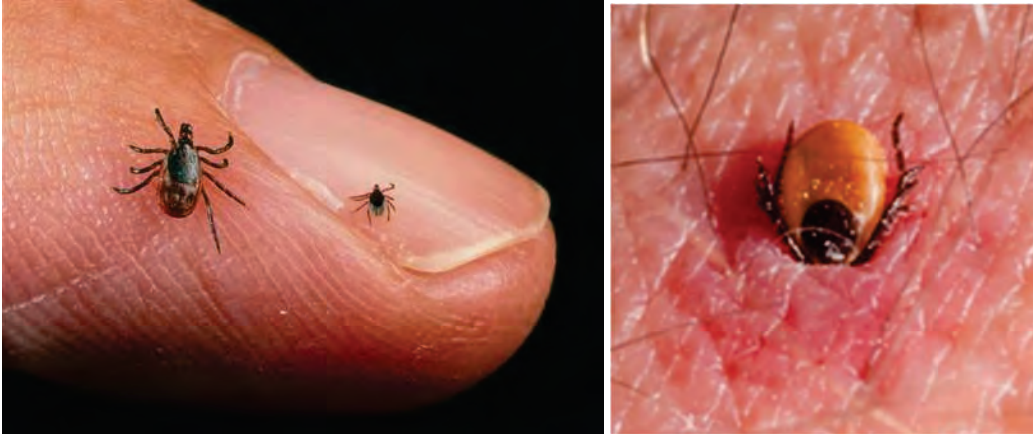
American dog tick (*Dermacentor variabilis*)

- > Distribution: Widely distributed east of the Rocky Mountains. Also occurs in limited areas on Pacific Coast.
- > Associated Diseases: Rocky Mountain spotted fever, Tularemia



Rocky Mountain wood tick (*Dermacentor andersoni*)

- > Distribution: Rocky Mountain states.
- > Associated Diseases: Rocky Mountain Spotted Fever and Tularemia



Characteristics

- > Ticks live in wooded areas, in tall brush / grass, under leaves, or on host animals themselves.
- > Ticks are related to mites and spiders. They have four stages of development — egg, larval, nymph, and adult stages.
- > From the larval to the adult stages, ticks attach to a living host and feed on the host's blood. In doing so, they may transmit germs that cause diseases, some that can have serious consequences for humans.
- > After hatching from the egg, the tick must take a blood meal to complete each stage in its life cycle. Each stage of the tick usually takes a blood meal from a different host. For most ticks, each meal is taken from a different type of host.
- > Ticks are usually active in the spring, summer, and fall; however, the adults of some species are active in the winter.
- > When seeking a blood meal, ticks move from leaf litter, from a crack or crevice along a building foundation or from another secluded place to grass or shrubs where they attach themselves to an animal as it passes.
- > Once it is on a host, a tick crawls upward in search of a place on the skin where it can attach to take a blood meal.
- > The tick's mouthparts are barbed, making it difficult to remove the tick from the skin. In addition, the tick manufactures a glue to hold the mouthparts in place.
- > Of the many different tick species found throughout the world, only a select few bite and transmit disease to humans.
- > Lyme disease is the most commonly reported tick-borne disease in the United States. Other tick-borne diseases in the U.S. include: Babesiosis, Ehrlichiosis, Rocky Mountain Spotted Fever, Southern Tick-Associated Rash Illness (STARI), Tick-Borne Relapsing Fever, Tularemia, Anaplasmosis, Colorado tick fever, Powassan encephalitis, Q fever.

Symptoms

Many tick-borne diseases have similar signs and symptoms. If you have been bitten by a tick and develop any of the symptoms below within a few weeks, months or even longer, see your doctor immediately. Tick-borne diseases can result in mild symptoms treatable at home to severe infections requiring hospitalization. Although easily treated with antibiotics, these diseases can be difficult for physicians to diagnose. Early recognition and treatment of the infection decreases the risk of serious complications. The most common symptoms of tick-related illnesses are:

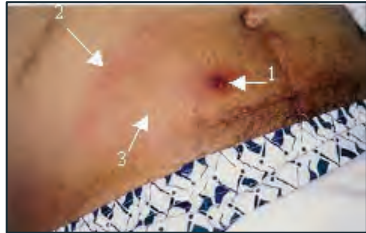
1. **Fever / chills:** With all tick-borne diseases, patients can experience fever at varying degrees and time of onset.
2. **Aches and pains:** Tick-borne disease symptoms include headache, fatigue, body/muscle aches, stiff neck, and facial paralysis. With Lyme disease you may also experience joint pain. The severity and time of onset of these symptoms can depend on the disease and the patient's personal tolerance level.
3. **Rash:** Different tick species carry different diseases, each which can result in distinctive rashes:
 - o The rash of Lyme disease may appear within 3-30 days, typically before the onset of fever. The Lyme disease rash is the first sign of infection and is usually a circular rash. This rash occurs in approximately 70-80% of infected persons and begins at the site of a tick bite. It may be warm, but is not usually painful. Some patients develop additional lesions in other areas of the body several days later.
 - o The rash of Southern Tick-Associated Rash Illness (STARI) is nearly identical to that of Lyme disease, with a red, expanding "bull's-eye" lesion that develops around the site of a lone star tick bite. Unlike Lyme disease, STARI has not been linked to any arthritic or neurologic symptoms.
 - o The rash of Rocky Mountain Spotted Fever (RMSF) varies greatly from person to person in appearance, location, and time of onset. About 10% of people with RMSF never develop a rash. Most often, the rash begins 2-5 days after the onset of fever as small, flat, pink, non-itchy spots on the wrists, forearms, and ankles and

spreads to the trunk. It sometimes involves the palms and soles. The red to purple, spotted rash of RMSF is usually not seen until the 6th day or later after onset of symptoms and occurs in 35-60% of patients.

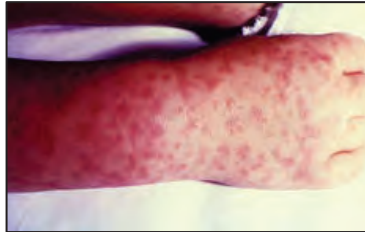
- In the most common form of Tularemia, a skin ulcer appears at the site where the tick entered the body. The ulcer is accompanied by swelling of regional lymph glands, usually in the armpit or groin.
- Ehrlichiosis can cause a rash in about 30% of patients and up to 60% of children. Rash appearance ranges from small, flat red spots to small, raised red bumps to small red or purple spots on the skin, and may appear after the onset of fever.



“Target” lesion on a patient with Lyme disease.



Patient with STARI.
1. Site of tick bite.
2. Red, radial, expanding edge of rash.
3. Central clearing.



Rash on hand and forearm of patient with Rocky Spotted Mountain Fever.



Ulcer caused by tularemia.

Treatment / Tick Removal

If you find a tick attached to your skin, remove the tick as quickly as possible:

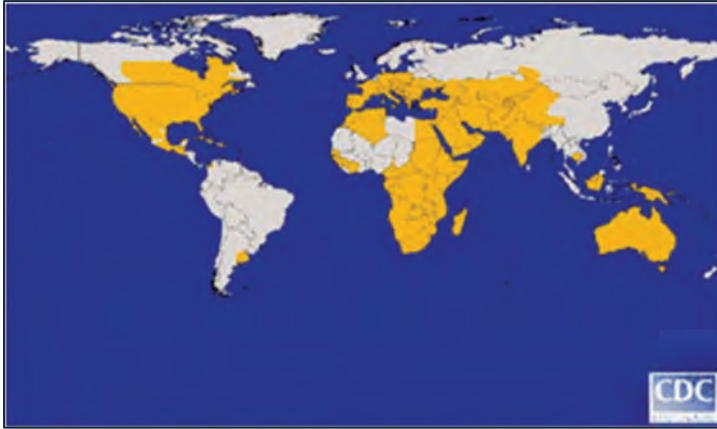
1. Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible.
2. Pull upward gently but firmly with steady, even pressure. Do not twist or jerk the tick; this can cause the mouthparts to break off and remain in the skin. If this happens, remove the mouthparts with tweezers. If you are unable to remove the mouth easily with clean tweezers, leave it alone and let the skin heal.
3. After removing the tick,
 - > Thoroughly clean the bite area and your hands with soap and water
 - > Apply an antibiotic to the bite area.
4. Follow-Up – If you develop fever / chills, aches and pains, flu-like symptoms, or a rash within several weeks of removing a tick, see your doctor immediately. Be sure to tell the doctor about your recent tick bite, when the bite occurred, and where you most likely acquired the tick.

Never use gasoline, kerosene, petroleum jelly, fingernail polish, or matches to kill or drive a tick out once it has become embedded.

Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

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West Nile Virus



Distribution

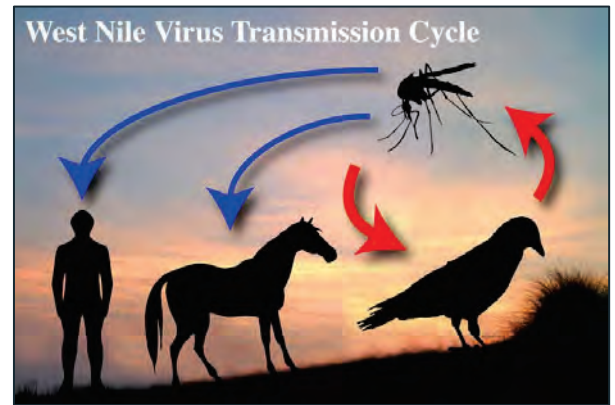
In the United States, West Nile Virus has been detected in all lower 48 lower states (not in Hawaii or Alaska).

What is West Nile Virus?

- > West Nile Virus is a mosquito-borne disease that can cause encephalitis or meningitis, inflammation of the brain or surrounding tissues.

Who is at risk for infection?

- > Anyone living in an area where West Nile Virus is present in mosquitoes can be infected.
- > The risk of infection is highest for people who work outside or participate in outdoor activities because of greater exposure to mosquitoes.
- > People with certain medical conditions (such as cancer, diabetes, hypertension, and kidney disease), elderly, young children, and pregnant moms are at greater risk for serious illness resulting from West Nile Virus.



How do people get infected with West Nile Virus?

- > Most people are infected with West Nile Virus by the bite of an infected mosquito. Mosquitoes become infected when they feed on infected birds. Infected mosquitoes can then spread the virus to humans and other animals.
- > In a very small number of cases, West Nile Virus has been spread through blood transfusions, organ transplants, and from mother to baby during pregnancy, delivery, or breastfeeding.

When do most cases of West Nile Virus disease occur?

- > Most people are infected from June through September.

Symptoms

- > Most people (70-80%) who become infected with West Nile Virus do not develop any symptoms.
- > About 1 in 5 people who are infected will develop mild disease, generally called West Nile fever, which may cause some or all of the following symptoms within 2 to 14 days after becoming infected:
 - Abdominal pain
 - Diarrhea
 - Fever
 - Headache
 - Lack of appetite
 - Muscle aches
 - Joint pains
 - Nausea
 - Rash
 - Sore throat
 - Swollen lymph nodes
 - Vomiting

These symptoms usually last for 3 – 6 days, but may last a month. Most people with this type of West Nile Virus disease recover completely, but fatigue and weakness can last for weeks or months.

- > Less than 1% of people who are infected will develop serious neurologic illness such as West Nile encephalitis or West Nile meningitis (inflammation of the brain or surrounding tissues). The following symptoms can occur, and need prompt medical attention:

- Headache
- High Fever
- Confusion or change in ability to think clearly
- Loss of consciousness or coma
- Stiff neck
- Muscle weakness
- Weakness of one arm or leg
- Tremors
- Seizures
- Paralysis

- > In rare situations, some people may experience anaphylaxis after being bitten by mosquitoes.
- > **CALL 911 IMMEDIATELY** or go to an emergency room if worker is suffering a severe allergic reaction, such as swelling or difficulty breathing, or has had any type of severe allergic reaction in the past.

Tips for Prevention

The most effective way to avoid West Nile Virus disease is to prevent mosquito bites:

- > Use insect repellents when you go outdoors. Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-mentane-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions.
 - Do not apply repellents containing permethrin directly to skin.
- > Wear long sleeves, long pants, and socks from dusk through dawn when mosquitoes are most active.
 - Mosquitoes may bite through thin clothing, so spraying clothes with repellent containing permethrin or another EPA-registered repellent will give extra protection.
- > Empty standing water from containers such as trash bins, buckets, plastic tarps, and wheelbarrows on a regular basis to help reduce the number of mosquitoes around your work area.
- > Report dead birds to local authorities. Dead birds may be a sign that West Nile Virus is circulating between birds and the mosquitoes in an area. By reporting dead birds to state and local health departments, you can play an important role in monitoring West Nile Virus.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
 - Wear a medical identification bracelet or necklace stating their allergy.

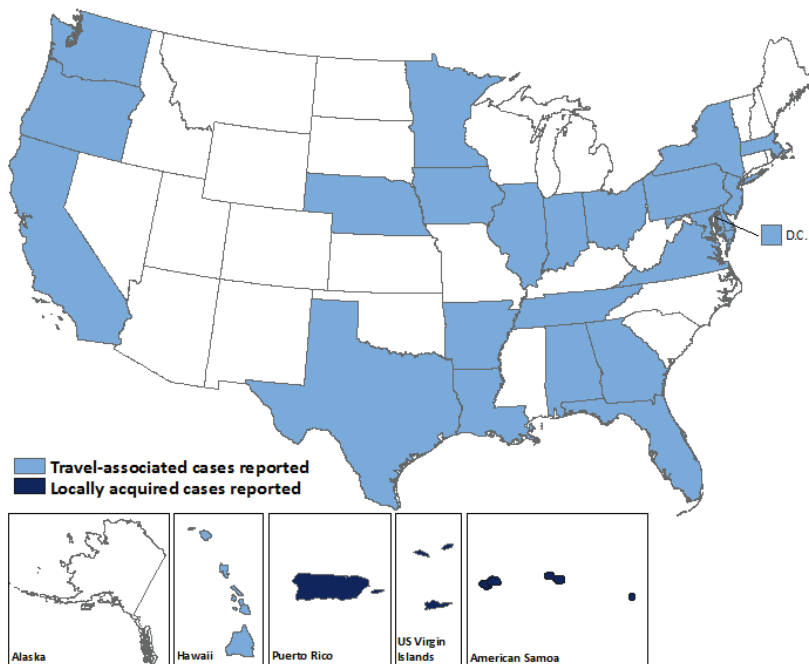
Treatment

If a worker is bitten by a mosquito:

- > Swat mosquito away to reduce further risk of infection.
- > If worker has had any type of severe allergic reaction to insect bites or stings, have someone stay with the worker to be sure that they do not have an allergic reaction.
- > **CALL 911 IMMEDIATELY** or go to emergency room if worker exhibits severe allergic reaction or signs of shock:
 - Swelling (hives) moves to other body parts, especially tongue, breathing tubes, face or neck.
 - Difficulty breathing, wheezing or choking sensation
 - Chest pain or tightness in chest
 - Nausea / Vomiting
 - Loss of consciousness
 - Severe sweating
 - Slurred speech
 - Dizziness
 - Blueness in the lips and skin
- > If no sign of shock, apply alcohol wipe, topical sting relief, and cold pack to reduce swelling.
- > Over-the-counter pain relievers can be used to reduce fever and manage pain. Follow directions on packaging.
- > Antihistamines may reduce itching.
 - Follow directions on packaging to avoid potential side effects.
 - Drowsiness or stomach irritation may occur.
 - Do not take antihistamine if worker has medical issues.
- > Call your health care provider if you develop symptoms of West Nile Virus infection.
- > **CALL 911 IMMEDIATELY** or go to an emergency room if you develop any of the following symptoms:

– Headache	– Loss of consciousness or	– Stiff neck
– High Fever	coma	– Tremors
– Confusion or change in ability to think clearly	– Muscle weakness	– Seizures
	– Weakness of one arm or leg	– Paralysis
- > Though people with milder symptoms typically recover on their own, in more severe cases, patients often need to be hospitalized to receive supportive treatment, such as intravenous fluids, pain medication, and nursing care.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

Zika Virus



Distribution

In the United States, local mosquito-borne transmission of Zika virus has been reported in Puerto Rico, US Virgin Islands and America Samoa. **No local mosquito-borne Zika virus disease cases have been reported in the US states**, but there have been travel-associated cases. With recent outbreaks, the number of Zika cases among travelers visiting or returning to the US will likely increase. 80% of cases will not be diagnosed. These imported cases could result in local spread of the virus in some areas of the US. (Center for Disease Control, Feb 2016).

What is Zika Virus?

Zika virus is a disease caused by Zika virus that is spread to people primarily through the bite of an infected *Aedes* species mosquito.

Transmission

- > Zika virus is transmitted to people primarily through the bite of an infected *Aedes* species mosquito. Mosquitoes become infected when they feed on a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.
- > Mosquitoes that spread Zika are aggressive daytime biters. They can also bite at night.
- > Mosquitoes that spread Zika prefer to bite people. They live indoors and outdoors near people.
- > A mother already infected with Zika virus near the time of delivery can pass on the virus to her newborn around the time of birth, but this is rare. A mother can pass Zika virus to her fetus during pregnancy. To date, there are no reports of infants getting Zika virus through breastfeeding.
- > Zika virus can be spread through sexual contact.
- > Zika virus can be spread through blood transfusion.
- > Anyone who lives in or travels to an area where Zika virus is found and has not already been infected with Zika virus can get it from the bite of an infected mosquito.
- > The risk of infection is highest for people who work outside or participate in outdoor activities because of greater exposure to mosquitoes.

Tips for Prevention

The most effective way to avoid Zika virus disease is to prevent mosquito bites

- > When possible, stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- > Wear long sleeves, long pants, and socks.

- Mosquitoes may bite through thin clothing, so spraying clothes with repellent containing permethrin or another EPA-registered repellent will give extra protection.
- > Use insect repellents when you go outdoors. Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-mentane-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions.
 - Don't apply repellents containing permethrin directly to skin.
 - If you are also using sunscreen, apply sunscreen before applying insect repellent.
- > Mosquito fogging near heavily visited areas (i.e., offices, portable toilets).
- > Eliminate mosquito breeding sites. Mosquitoes typically lay eggs in and near standing water. Empty standing water from containers such as trash bins, buckets, plastic tarps, and wheelbarrows on a regular basis to help reduce the number of mosquitoes around your work area.
- > Limit travel to site by immune-compromised persons or expectant mothers.
- > Workers with a history of severe allergic reactions to insect bites or stings should:
 - Carry an epinephrine auto injector (EpiPen)
 - Wear a medical identification bracelet or necklace stating their allergy.

Treatment

- > There is no vaccine to prevent or specific medicine to treat Zika infections.
- > Treat the symptoms:
 - Get plenty of rest.
 - Drink fluids to prevent dehydration.
 - Take medicine such as acetaminophen (Tylenol®) to relieve fever and pain.
 - Do not take aspirin and other non-steroidal anti-inflammatory drugs.
 - If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.
- > If you have Zika, prevent mosquito bites for the first week of your illness.
 - During the first week of infection, Zika virus can be found in the blood and passed from an infected person to a mosquito through mosquito bites.
 - An infected mosquito can then spread the virus to other people.
- > Call your health care provider if you develop symptoms of Zika virus and have visited an area where Zika is found.
- > Call (888) 449-7787 for a Care Management Nurse who will provide further guidance and injury information.

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Stantec 203722941.HASP.2024

APPENDIX E
SAFETY DATA SHEETS

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Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE		NEW/REVISED	
Stantec		1/31/2023		<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 13	
WORK ACTIVITY (Description):					
DRIVING					
The Driving JLA covers the pre-drive hazards check, leaving and entering driveways, general driving, intersections, long-distance driving, stopping, and parking.					
EQUIPMENT necessary to mitigate hazards associated with this work activity:					
Fire Extinguisher, First Aid Kit, Triangles or Cones, Spare Tire, Jack, Wheel Chocks					
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE		
Alejandro Chairez	Environmental Technician	Sean Guiltinan	SSH&E Program Manager		
Bridget Cook	Staff Scientist	Andrew Whitman	Senior Staff Scientist		
		Jens Walker	Senior Staff Geologist		
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)					
<input type="checkbox"/> Reflective Vest <input type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input type="checkbox"/> Safety Glasses		<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Safety Shoes—Type: _____		<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input type="checkbox"/> PPE Clothing—Type: _____	
				<input type="checkbox"/> Gloves—Type: _____ <input type="checkbox"/> Other—Specify: _____	
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.					
¹ JOB STEPS		² POTENTIAL HAZARDS		³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Engine Start & Initial Drive		<ul style="list-style-type: none"> Mechanical Failure causing operator to lose control or cause an accident from no working horn, signal, poor visibility, etc. 		<ul style="list-style-type: none"> Perform a complete vehicle inspection at the beginning of the drive: <ul style="list-style-type: none"> Check the windows. Are they clean? Ensure the wipers work. Check the tires for proper inflation and tread. Check the Registration/Insurance/Maintenance report. Are they all current? Check the horn, lights, and back-up alarm (if equipped) for proper operation. Check for wheel chocks. Check the gauges on the instrument panel. Are they working correctly and giving satisfactory readings? Check for body damage. Are there any unsafe parts ready to fall off during the drive? Check under the vehicle. Are there any leaks or obstructions? Check and secure loose items in the cab, passenger area, trunk, and/or truck bed. Adjust the belt/shoulder harness, seat, head rest and mirrors before driving. Always wear the seat belt/shoulder harness when driving. Before long trips and at every fuel tank fill, check the oil, coolant, transmission, and brake fluid levels. Also ensure the fire extinguisher, first aid kit, triangles or cones, spare tire and jack are present and in good condition. 	
		<ul style="list-style-type: none"> Collision with pedestrians, vehicles, or property 		<ul style="list-style-type: none"> Always perform a "walk-around" before driving the vehicle, especially if you need to engage the reverse gear. Look for small objects and pedestrians that you normally wouldn't see when looking from inside the vehicle. Always use a spotter when available. Review the use of hand signals with the spotter before maneuvering the vehicle. Turn the headlights on while driving, even in the daytime, to make sure others see you. 	
2. Driving from the parking lot or driveway into a traffic lane		<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles Mechanical Failure (Engine) 		<ul style="list-style-type: none"> Always look over your shoulder when pulling out into traffic. Use slow, easy acceleration. Avoid "jack-rabbit" starts. 	
3. General Driving		<ul style="list-style-type: none"> Mechanical Failure/Collision (Loss of Steering Control) Collision with pedestrians, vehicles, or property 		<ul style="list-style-type: none"> Maintain the hand position at 9 and 3 to avoid loss of control of the steering wheel. Steering loss can happen at any time from potholes, debris, and distractions. Obey all traffic laws, signals and signs. Always use turn signals when turning or changing lanes. Use the "SMOG" technique (Signal, Mirror check, look Over Shoulder and Go) when making a lane change or entering traffic. 	
4. Approaching Intersections		<ul style="list-style-type: none"> Collision with pedestrians, cyclists, skateboarders, or other vehicles 		<ul style="list-style-type: none"> 30-40 feet back from the limit line of the intersection is the Point of No Return (PONR). 	

Job Loss Analysis

4. Approaching Intersections (continued)	• Collision with pedestrians, cyclists, skateboarders, or other vehicles	• If the signal light is still green when passing the PONR, then look Left-Right-Left (L-R-L) and proceed through the intersection provided there are no red-light runners from cross traffic. This can be done even if the light turns yellow after passing the PONR. • If the signal light turns yellow before the PONR, then ease slowly to a stop, 15' before the limit line or the vehicle in front.
	• Chain reaction collision from "rear-enders"	• Always plan to have 15' of space cushion in front of the vehicle when stopping at intersections. This will break up a "chain reaction".
	• "Car Jacking" or vehicle theft while stopped	• Keep the 15' space cushion in front of the vehicle. Carjackers look for those potential victims who continually trap themselves.
	• Mechanical Failure (Brakes and Transmission)	• Use slow, gradual deceleration techniques. Avoid hard braking.
5. Normal Driving between intersections and on long stretches of highway	• Collision with pedestrians, cyclists, skateboarders, or other vehicles	• Maintain a 15 second Eye Lead Time. • Avoid the fixed stare by keeping your eyes moving (every 5 to 8 seconds). • Scan the mirrors every 5-8 seconds to maintain the circle of awareness. • Maintain a space cushion of "4 seconds" in front of the vehicle. • Avoid driving in other driver's blind spots. Maintain a space cushion to the sides of the vehicle.
	• Collision from "tail-gators"	• Increase the following distance to the front of the vehicle • Make a convenient lane change to the right and allow the "tailgater" to pass.
6. Stopping and Parking	• Collision with pedestrians, cyclists, skateboarders, or other vehicles, run away vehicle	• Always obey signs and use signals when in a parking lot. • Do not exceed 15 mph in a parking lot. • Plan ahead and try to "pull-through" to avoid backing at the end of the visit. • If unable to "pull-through" then back into a perimeter slot or pull into a slot well away from everyone else to maintain a space cushion when leaving. • Get Out and Look (GOAL) before backing into or from a parking slot. • Check parking area for obstructions/hazards when there is limited line of sight, blind spots from the vehicle or other site features or vehicles already parked on the site • Always put transmission into park and turn off ignition when parking. • Always set the parking brake and use wheel chocks when parked.
	FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.	

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 5
WORK ACTIVITY (Description):			
FENCE INSTALLATION / REMOVAL			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Mike Burnell	Senior Field Technician	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Puncture Resistant, Crush Resistant (75lbs), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant & Puncture Resistant <input checked="" type="checkbox"/> Other—Specify: Snake Chaps, Knee Pads
REMINDER: Complete an SPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Arriving on site	Vehicular accident - Getting hit by or hitting another car	Follow maximum 5 mph speed limits on site. (LSA 2) Use a spotter when reversing. Ensure spotter is equipped with air horn. Honk horn before reversing.	
2. Tailgate H&S meeting	Getting struck by a moving vehicle	Conduct H&S meeting in a safe location (away from traffic). (LSA 2) Inspect H&S meeting location for bees and other biological risks.	
	Inattention to safety meeting	Do not use cellphone during H&S meeting. Engage all crew in meeting.	
3. Site walk through and inspecting work area	Slip, trips, and falls – Twisted/broken ankle	Review General Site Activity JLA before performing this step. Watch your foot placement and avoid gopher holes and un-even terrains. Take smaller steps than normal.	
	Biological hazard	Wear snake chaps.	
4. Install/Remove fence material	Back strains	Bend with knees, keeping your back straight.	
	Splinters / punctures from wooden stakes and metal mesh	Use the provided level 4 puncture resistant gloves. Inspect wooden stakes for splinters and do not use if damaged. Use stake holding tool. Avoid handling mesh by edges.	
	Slip trips and falls	Watch your foot placement and avoid gopher holes and uneven terrain.	
	Biological Hazards	Inspect bushes and vegetation for biological hazard when working near them.	
	Puncture to knee from debris	Inspect ground before kneeling. Wear knee pads.	
5. Rolling wire fencing material	Back strains	Do not lift any more that 50 pounds at a time. Always lift with legs, not back, when moving bundles.	
	Hand injury from sharp wire ends	Wear provided level 5 cut resistant and puncture resistant gloves.	
6. Install/Remove plastic bucket	Back strains	Bend with knees, keeping your back straight.	
	Slips, trips, falls	Watch your foot placement and avoid gopher holes and uneven terrain.	
	Knee injury	Inspect ground before kneeling. Wear knee pads.	
	Hand injury, scrape and cuts	Use the provided level 4 puncture resistant gloves.	
7. Cleaning work area and packing tools	Back strains	Bend with knees, keeping your back straight.	
	Hand injury, scrape and cuts	Wear level 3 cut resistant gloves.	
8. Departing site	Vehicular accident - Getting struck/ hit by another car	Follow maximum 5 mph speed limits on site. (LSA 2) Use a spotter when reversing. Ensure spotter is equipped with air horn. Honk horn when reversing.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Job Loss Analysis

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

- ¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- ² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 29
WORK ACTIVITY (Description):			
GENERAL SITE ACTIVITY The purpose of this JLA is to focus employee attention on common hazards that occur in the work environment and keeping awareness high to mitigate these hazards. This JLA must be used in conjunction with a task and/or site-specific JLA. This JLA shall be reviewed anytime working conditions and or tasks change at the job site.			
EQUIPMENT necessary to mitigate hazards associated with this work activity: Traffic Control Devices, Hand Tools, Wheel Chocks, Signage (authorized personnel only, hard hat area, hearing protection must be worn)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Cole Grover	Project Scientist	Sean Gultinan	SSH&E Program Manager
Laina Cole	LPS Steward	Andrew Whitman	Senior Staff Scientist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input checked="" type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long Sleeve Protection Required	<input checked="" type="checkbox"/> Gloves—Type: Nitrile and Level 3 Cut, Puncture, Impact Resistant <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. General Site Activities - preparing work area & traffic control (does not cover working in the street, review Traffic Control JSA)	Traffic Hazards, being struck by /striking third party, contractor vehicle, or client property	<ul style="list-style-type: none"> • Park field vehicles in safe/low traffic area where tailgate safety meeting/paperwork can be conducted safely. (LSA2) • All contractor/consultant parked onsite vehicles must be chocked. • Use crosswalk when crossing the street. (LSA2) • Notify attendant and/or owner/manager of work activities/location. • Verbally communicate with third party workers/co-workers the hazards and PPE requirements. • Ensure work area and equipment are within a defined exclusion zone using traffic barricades and/or delineators with caution tape. Use company vehicle to block access. (LSA2) • If vehicles do not pose contact hazard with personnel or equipment, leave opening for vehicle traffic to move across site. (LSA2) • Wear high visibility clothing such as a reflective vest or reflective suit (Class II Minimum) • Wear level 3 cut, puncture, impact resistant gloves for setup of traffic control equipment. • Continually watch out for vehicle traffic and plan a safe pathway to move clear of vehicles if they approach within 15 feet. (LSA2) • Where vehicles may pass work area, post traffic watch to warn employee of dangerous vehicle movement (vehicle backing up or driving towards work area). (LSA2) • Traffic watch to establish warning signal in case equipment operation generates noise levels preventing verbal warning (when operator cannot hear you >2 feet away using a conversational voice). • Apply 360 degree check and Smith driving techniques using a spotter prior to backing or moving vehicle around site. Ensure spotter is equipped with air horn. • Use vehicle 4-way flashers and beacon if available when moving vehicle around high vehicle and pedestrian traffic areas. (LSA2) 	
	Unauthorized Access, third party entering work area gets hurt or causes injury or accident	<ul style="list-style-type: none"> • Prevent unauthorized access by delineating the work area. Utilize physical barriers such as caution tape, fencing and barricades, vehicle to prevent inadvertent entry. • For construction work, post signage to indicate work area (hard hat area, authorized personnel only, hearing protection, double hearing protection, Prop 65). 	
	Potential for crime and aggressive individuals causing injury or worse	<ul style="list-style-type: none"> • Stay aware of surroundings; avoid confrontation. Do not leave doors of vehicle unlocked at any time. Have phone readily available to contact 911 in the event of emergency. Prepare to leave the area if personal safety appears at risk. 	
2. General Site Activities - employee dress, prepared for work	Loose Clothing & Jewelry, Long Hair, Keys Attached to Belt Clip Caught by Rotating Equipment or Other Obstructions - loss of or tear in appendage from being caught	<ul style="list-style-type: none"> • No loose sleeves, tails, ties, frills, lapels, cuffs, or other loose clothing shall be worn around machinery where it might entangle. • Where there is a risk of injury from long hair, jewelry, or keys attached to a belt clip entangling in moving parts of machinery or getting caught on ladders or other fixed structures, employees shall confine, secure or remove the item to eliminate the hazard. 	

Job Loss Analysis

3. General Site Activities - accesses, walking the site	Slips, Trips, Falls - strains, broken bones, twisted joints	<ul style="list-style-type: none"> • Rocks, dirt mounds and dead vegetation are significant trip hazards, know body position and avoid stepping on rocks or dragging your feet around soft dirt, remove long vegetation from work zone. • Keep work area dry and free of excess materials, debris. • Remove trip hazards; keep materials organized/out of walkways • Stay aware of footing and walk, do not run. • Do not step backwards without first looking at footing surface. • If freezing temperatures, watch for ice slip hazards.
4. General Site Activities - climbing ladders / equipment / buildings	Mounting - Dismounting Equipment - strains, broken bones, twisted joints, and falls	<ul style="list-style-type: none"> • Do not carry anything in hands while climbing/descending ladder. Carry keys in pocket (not attached to belt loop) and tools in tool belt. • Use 3 points of contact when climbing up/down ladders/equipment. • Always face equipment/ladders when mounting and dismounting. • Make sure ladders are secure before using. • Fall protection required when working at heights greater than 6 feet, includes ladders. (LSA 1) • Identify stable surface before stepping down on it (never jump off).
5. General Site Activities - environmental working conditions	Heat/Cold Stress - serious injury to body, possible death	<ul style="list-style-type: none"> • In hot environment, drink small amounts of water often, about 8 oz every 15 minutes. Start drinking water 1-2 hours before work begins. • Take breaks based on heat index rule: For temperatures < 85 F, work continuously. For temps 85 F to 95 F, work 40 minutes followed by 20 minutes rest. For temps > 95 F, work for 20 min followed by 40 minutes rest. Additional cooling measures required (i.e., water dampened clothing, cool mist). • In hot environments wear light clothing, sunscreen for exposed skin • In hot environments take rest breaks in covered, shaded area. If no shade, idle vehicle with AC on. • Cold environment consume non-caffeine sweet liquids, heavy meals • Cold environment wear layered clothing to adjust. • Review HASP Attachment for Heat and Cold Stress Protocols • Adjust work schedule to avoid heat/cold stress.
6. General Site Activities - biological hazards	Biological Hazards: Insects, Snakes, Wildlife, Vegetation, Feces, Blood	<ul style="list-style-type: none"> • Inspect work areas upon arrival to site to identify hazards • Use insect repellent as necessary. Evaluate risk. If uncertain contract professional exterminator (i.e., beehive). • Open enclosures slowly to react against biological hazards. • Stay alert and out of contact distance from biological hazards. • Use universal precautions if encounter blood on site. If needles are observed, isolate the hazard using a cone or delineator and notify the property manager. Notify employees to avoid hazard. Do not touch. • In areas with large amounts of rodent or bird feces, do not work in or create dust. Requires professional abatement; call PM. • Identify poisonous plants - poison sumac, stinging nettles, poison ivy, or poison oak. • Wear snake chaps if in area known for snakes. Use walking stick to probe tall grass before entering.
7. General Site Activities - impact hazards	Body, arm, leg, hand, foot impact line of fire hazards	<ul style="list-style-type: none"> • Evaluate work area to ensure worker body is not in a line-of-fire hazard. STOP WORK and address with PM if risk is present to isolate or eliminate impact hazard.
	Hand hazards from being caught, crushed, cut, pinched, or damaged.	<ul style="list-style-type: none"> • Use Hands Program when more than one person working around the same equipment. • No fixed blades are to be used by staff or subcontractors. • Before you put your hands somewhere, ask yourself, "Can my hands be cut, crushed, torn or damaged by what I am about to do?" • Use Level 3 cut, puncture, impact resistant gloves for general work, and chemical resistant over glove for impacted soil, water and hazardous materials, heavy over-leather for hot/cold. Cut protection must be worn at all times while working. • Use tool to take the place of hand when cutting, impact or crushing hazards are present. Keep hands 6 inches clear of any pinch hazard
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 3
WORK ACTIVITY (Description):			
OVERSIGHT OF GEOPHYSICAL INVESTIGATION / SUBSURFACE UTILITY DESIGNATING			
This JLA covers the hazards associated with performing utility designating services at various sites.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Traffic Control Devices (as needed/job specific), Hand Tools, Wheel Chocks, Signage (authorized personnel only, hard hat area, no smoking), Spray Paint, Metal Detector, Ground Penetrating Radar (GPR)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
James Foster	Utility Designation Technician	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection (as needed) <input checked="" type="checkbox"/> Safety Shoes— Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long Sleeve Protection Required	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut, Puncture, Impact Resistant <input type="checkbox"/> Other—Specify:
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Loading and Unloading Equipment	<ul style="list-style-type: none"> Ergonomics – back strains while lifting, bending, twisting, squatting causing chronic back pain 	<ul style="list-style-type: none"> Lift with knees, not your back. Keep load close to body about waist height. Keep back straight while lifting, moving, and placing. Do not carry more than 50 LBs per person. Ask for help to carry heavy items and or awkward items Remove only one piece of equipment at a time. Do not carry equipment when entering or exiting vehicles. Plan your route. 	
	<ul style="list-style-type: none"> Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> Inspect work area for tripping and slipping hazards (water, mud, ropes, equipment, etc.) and remove obstacles or move away from work area. Maintain 3-point contact when climbing onto or down from equipment, trailers and trucks. 	
2. Operating utility designating equipment	<ul style="list-style-type: none"> Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> Rocks, dirt mounds and dead but moist vegetation are significant trip hazards. Know body position and avoid stepping on rocks or dragging your feet around soft dirt. Remove long vegetation from work zone. Watch where walking. Stop to take reading. Do not multi-task. Keep work area dry and free of excess materials, debris. Remove all trip hazards by keeping materials/objects organized and out of walkways. Stay aware of footing. Walk, do not run. 	
	<ul style="list-style-type: none"> Struck by vehicles – serious injury or fatality 	<ul style="list-style-type: none"> Set up exclusion zone around work area being surveyed. Face oncoming traffic at all times. Watch traffic keeping eye contact with the drivers. Move away from exclusion zone edge if driver is not paying attention. Request “second set of eyes” provided by Stantec Supervisor to act as safety alert. Agree on warning mechanism. Plan escape route. 	
3. Marking Utilities	<ul style="list-style-type: none"> Being sprayed in the face with marking paint – damage to eyes Chemical exposure to propellant acute headache or dizziness Possible fire from propellant in spray can 	<ul style="list-style-type: none"> Keep cap on spray paint can while mixing. Never point spray paint at someone or your own face. Use in well vented area. Never spray paint on open flame or electrical arch or ignition source, e.g. spent cigarettes. (LSA 6) 	
4. Lifting manhole covers or grate inlets	<ul style="list-style-type: none"> Ergonomics – back, neck, shoulder strains while lifting, bending, twisting, squatting 	<ul style="list-style-type: none"> Lift with knees, not your back. Keep load close to body about waist height. Keep back straight while lifting, moving, and placing. Use a magnetic manhole cover lifting system or other lifting system to safely lift manhole covers and grate inlets. 	

Job Loss Analysis

<p>4. Lifting manhole covers or grate inlets (continued)</p>	<ul style="list-style-type: none"> • Impact – potential of crushing fingers and hands 	<ul style="list-style-type: none"> • Before putting hands somewhere, ask yourself, "Can my hands be cut, crushed, torn or damaged by what I am about to do?" • Hand protection must be worn at all times while working. <ul style="list-style-type: none"> ○ Wear Level 3 cut, puncture, impact resistant gloves for general work. ○ Wear chemical resistant over glove for impacted soil, water and hazardous materials. ○ Wear heavy over-leather for hot/cold. • Never place fingers or hands beneath manhole/grate cover and rim of vault.
	<ul style="list-style-type: none"> • Biological – Insects, Snakes, Wildlife, Vegetation, Feces, Blood 	<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. • Use tool (pry bar) and visual inspection to explore well vault before reaching in with gloved hand.
<p>5. Designating electric facilities</p>	<ul style="list-style-type: none"> • Possible shock, arc flash exposure, or electrocution 	<ul style="list-style-type: none"> • Verify with utility locator electrical safety precautions for attaching to live electrical equipment. • Maintain 10-foot clearance from live electrical equipment (transformers, switches, sub-panels, motors, etc.). Only utility owner representatives are qualified to access this equipment. • Confirm utility locator is connecting a current only to ground potential or neutral conductor. Never apply current to live electrical equipment. (LSA 5)
<p>6. Perform Site Cleanup</p>	<ul style="list-style-type: none"> • Ergonomics – back strains while lifting, bending, twisting, squatting 	<ul style="list-style-type: none"> • Lift with knees, not your back. • Keep load close to body about waist height. • Keep back straight while lifting, moving, and placing. • Do not carry more than 50 LBs per person. • Ask for help to carry heavy items and or awkward items. • Remove only one piece of equipment at a time. • Do not carry equipment when entering or exiting vehicles
	<ul style="list-style-type: none"> • Slips / Trips / Falls – strains, broken bones, twisted joints and falls 	<ul style="list-style-type: none"> • Inspect work area for tripping and slipping hazards (water, mud, ropes, equipment, etc.) and remove obstacles. • Maintain 3-point contact when climbing onto or down from equipment, trailers and trucks.
<p>FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.</p>		

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

- ¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- ² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 21
WORK ACTIVITY (Description):			
GROUNDWATER SAMPLING			
This JLA covers routine sampling of groundwater wells on property. Working in remote area around livestock requires the use of the Monitoring and Gauging JLA			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Impact Driver, Magnets rated for various lids, Manhole Dolly for 2x2 and larger lids, Screwdriver, Ratchet, Pry Bar, Groundwater Sampling Equipment and Sample Containers			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Gary DeCarlo	QM Manager	Sean Guitinan	SSH&E Program Manager
David Daniels	Project Geologist	Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Impact Resistant (75lb), Electrical Hazard Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required	<input checked="" type="checkbox"/> Gloves—Type: Level 5 Cut Resistant with listed puncture & impact resistance (general work) Level 3 cut & listed puncture resistance (sampling) <input type="checkbox"/> Other—Specify:
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Maneuvering Vehicle/Trailer On Site	• Collision with person/vehicle/property - damage to property, person being hit and run over	<ul style="list-style-type: none"> • Communicate with other onsite personnel where work is taking place and how long it will take. • Visually assess pathway before relocating vehicle to ensure safe route before moving. • Clear communication between spotter and driver, including agreed position for spotter and hand signals for left, right, move and stop. Ensure spotter is equipped with air horn. • Wear traffic vest. • Driver must stop vehicle if spotter is not visible. 	
	• Items falling from truck	<ul style="list-style-type: none"> • Drive with the tailgate closed whenever possible. If the tailgate must remain open, strap down any loose items. • Conduct a walk around of the vehicle before moving to another location. Secure loose items 	
2. Handling Equipment/Removing - Replacing Well Lids	• Over Exertion- Lifting Heavy Equipment with "Butts Up" (Legs straight and back bent)	<ul style="list-style-type: none"> • Get help with objects that are too heavy (>50 lbs.) or awkward for one person to lift. Use mechanical means such as pallet jack, wheelbarrow, dolly to transport heavy materials • Keep aware of body positioning and use lifting techniques: Bend at knees, lift with legs, keep a straight back, tighten core muscles, keep load within 6 inches of body. 	
	• Coming into contact with sharp and/or heavy objects	<ul style="list-style-type: none"> • Wear cut resistant level 3 gloves and safety shoes as defined by ANSI Z41. 	
	• Coming into Contact with objects Slips/Trips/Falls - cuts, broken bones, damage ligaments/tendons	<ul style="list-style-type: none"> • If lid is removable, store as close as possible. Clear of potential walkways to avoid tripping hazards. Consider placing lid underneath tailgate of truck if feasible. Replace well lid as soon as you complete task to eliminate a potential trip hazard. 	
	• Exposure to Contaminants, biological hazards	<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. Use tool (screw driver) and visual inspection to explore well vault before reaching in with gloved hand. 	
	• Heavy Well Lids/Covers - crushed or amputated fingers/toes; "Twist and Shout" leading to Back Strain	<ul style="list-style-type: none"> • Wear cut resistant under and Nitrile over gloves. • Keep hands/fingers away from raised covers. • Use hand tools to initially loosen and hold well vault lids; do not place fingers under lid • Use Heavyweight steel dolly to remove oversized well vaults to prevent injuries to fingers, toes and long term back injuries/soreness. Use weight-rated magnets to remove smaller well vault lids. 	
3. Purging Wells	• Splash hazard when gauging wells	<ul style="list-style-type: none"> • Safety glasses with side shields must be worn at all times. • Nitrile/cut resistant gloves must be worn while handling the bailer. 	
	• Exposure to Vapors and Airborne particulates	<ul style="list-style-type: none"> • Check for the presence of NAPL. Call PM if NAPL is encountered for instructions on how to proceed. • If NAPL is confirmed and the PM decides to proceed with work on the well, consult the NAPL bailing JLA. 	
		<ul style="list-style-type: none"> • Keep lids closed on poly tanks and drums as much as possible. 	

Job Loss Analysis

4. Collecting Groundwater Samples	• Contact with sharp objects (broken Sampling Bottles) - cuts	<ul style="list-style-type: none"> • Use clear glass VOAs. • Visually inspect each glass bottle for defects prior to use. • Place VOA in holding device and then tighten on lid • Wear cut-resistant gloves under Nitrile gloves while handling glass sample bottles.
	• Sample bottle falling and breaking - exposure to impacted water, cuts	<ul style="list-style-type: none"> • Large sample containers must be secured in event it tips. Place large sample container in plastic tote or box to secure while opening, filling and closing container. • Review Sample Packing SOP before packing and shipping samples.
5. Locking Well Caps	• Exposure to Contaminants, biological hazards, cuts to hands	<ul style="list-style-type: none"> • Wear cut resistant level 3 under and Nitrile over gloves. • The well cap must be effectively sealing well and be locked.
		<ul style="list-style-type: none"> • Watch for spiders and other insects before putting hands into well vaults. Use tool (screw driver) and visual inspection to explore well vault before reaching in with gloved hand.
6. Cleaning Up and Departing the Site	• Slips, trips and falls - results in broken bones and torn ligaments/tendons	<ul style="list-style-type: none"> • Check that well covers are secure upon departure, and that all tools and bailing equipment are removed from the site. • Walk around site and vehicle to perform a visual inspection before demobilization.
	• Demobilization	• Review Driving JLA
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

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- ³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED REV # 3
WORK ACTIVITY (Description):			
TRUCK LIFT GATE OPERATION			
This JLA addresses the hazards involved with operating a standard motorized lift gate on the back of work truck.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
General equipment, drums or tools loaded on the lift gate, lift gate.			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Mike Burnell	O&M Manager	Peter Petro	HSE Director
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes— Puncture Resistant, Electrical Hazard, Crush/Impact Resistant	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Nitrile & Level 4 Cut Resistance <input type="checkbox"/> Other—Specify:
REMINDER: Complete an SPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Load equipment, drums or material on lift gate	<ul style="list-style-type: none"> • Back strain while lifting and loading items • Trip slip and fall • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Lift with your knees and within your body green zone (knees to chest, maximum 2" to 3" from body). • Do not twist your body while carrying. • When practical, move the truck closer to items to be loaded. • If loading items from the ground on wheels (drums on dolly, generator, wheelbarrow etc.), ensure lift gate is lowered to the ground. • If loading bags and hand-carried items, raise lift gate to waist level. • If loading from the truck's side, ensure lift gate is up all the way. • Plan your route. Make sure no tools or trip hazards are in your route. • Wear level 4 cut resistant gloves. 	
2. Securing load before lifting it	<ul style="list-style-type: none"> • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • If moving load to make extra room, do not put hand in-between two items (between drums, etc.) • Wear level 4 cut resistant gloves. 	
3. Lifting load	<ul style="list-style-type: none"> • Items falling of lift gate • Operator falling from lift gate • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Do not overload lift gate. If not familiar with gate capacity, stop and ask other workers. Do not proceed until gate capacity is confirmed. • Keep all tools and load at least 6" away from all edges of lift gate even if load is very light. • Keep feet and body at least 6" away from edge of lift gate. • Do not hold onto any moving parts of the lift gate. • Do not put hand in the line of fire of moving gate parts. • Hold nearest side gate of the truck is recommended. 	
4. Moving load out of lift gate	<ul style="list-style-type: none"> • Falling off the lift gate • Back strains • Trip slip and falls • Hand injury, scrape and cuts 	<ul style="list-style-type: none"> • Keep feet and body at least 6" away from edge of lift gate. • Bend with knees. Keep back straight. • Watch foot placement. • Do not walk over chains securing the sides of the lift gate. • If unloading to work zone, ensure lift gate is flush to ground level. • If unloading to truck's bed, ensure lift gate is flush to truck's level. • Wear level 4 cut resistant gloves. 	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
- LSA 2: Protection from Moving Equipment and Vehicles
- LSA 3: Restrict Access to Suspended Loads
- LSA 4: Dig with Caution

- LSA 5: Isolate Energized Equipment
- LSA 6: Prevent Hot Work Explosions/Fires
- LSA 7: Establish/Maintain Safe Confined Space
- LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 19
WORK ACTIVITY (Description):			
PORTABLE GAS OR DIESEL POWERED GENERATORS			
This JLA covers the hazards associated with using portable gasoline- or diesel-powered generators to provide electrical power for electric tools, lights, pumps, etc.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Hand Cart, Wheelbarrow, Generator, Fuel Container, GFCI Tester			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
George Gonzalez	Field Specialist	Sean Guiltinan	SSH&E Program Manager
Andrew Yonkofski	Scientist II	Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input checked="" type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Electrical Hazard, Crush/Impact Resistant 75lbs.	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant & Fuel-Resistant Over-gloves <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Unloading/Loading Generator	• Back injury from “Elbows Out”, “Butt’s Up,” “Twist and Shout,” and/or “Overreaching”.	• Do not lift anything >50 lbs. or awkward shape without assistance. Bend and lift using legs/arms, not your back. Tighten your stomach muscles before the lift. Do not twist.	
	• Injury from pinch points	• Lift and move generator using handle grips on generator.	
	• Burns from hot surfaces	• Use lift gate, hand cart, or wheel barrel to lift and move generator, when available.	
	• Unsecured equipment - spill of fuel, damage to generator/other equipment	• Position hands and feet out of pinch and crush points when moving generator. Wear level 3 cut resistant gloves. Impact resistant/cut resistant or leather over gloves recommended.	
2. Fueling Generator	• Back strain from “Butts Up” or “Elbows Out”	• Allow generator to cool prior to moving it.	
	• Eye or skin contact from fuel	• Ensure that generator is secured against movement or jostling prior to transport.	
	• Explosion and fire	• Position generator at waist height if possible. Bend using legs, not at the back. Keep back straight, core engaged and arms in front of body.	
	• Inhaling fumes from fuel	• Wear safety glasses and fuel-resistant over-gloves.	
	• Explosion and fire	• Pour slowly.	
		• Ensure the spout is tightened to the can.	
		• TURN OFF GENERATOR AND ALLOW TO COOL. Never fuel generator while it is operating or in an overheated condition. (LSA 6)	
		• Fuel generator in open air environment to avoid fumes.	
		• Ensure any spilled fuel has dried or is wiped off prior to starting generator.	
		• Do not store fuel containers in the vicinity of the generator. Ensure that all materials are clear of the exhaust. Heat from the exhaust can get very hot and cause some materials to melt and/or burn.	
	• Inspect fuel lines for leakage. Keep generator properly maintained.		
	• Keep a 20 lb fire extinguisher next to the generator. (LSA 6)		
	• Electrical shock		
	• Ensure generator is properly grounded. Consult Owner’s Manual prior to operation. (LSA 8)		
	• Dry your hands before touching generator.		
	• If you must use a generator when it is wet outside, protect the generator from moisture. Do NOT operate generator indoors.		
	• Ensure generator is equipped with a Ground Fault Circuit Interrupter (GFCI). Test GFCI to ensure electrical power is interrupted. (LSA 8)		
	• If GFCI is not built into the generator, plug a GFCI tester into the generator followed by the electrical cord & test operation. (LSA 8)		
	• Check that the entire length of each electrical cord is free of cuts or tears and that the plug is not altered prior to connecting to generator.		
	• Protect electrical cords from getting pinched or crushed.		
	• Make sure the wattage rating for each cord exceeds the total wattage of all appliances connected to it.		

3. Starting Generator	• Back strain from "Twist and Shout"	• If generator is equipped with a pull cord to start, ensure adequate spacing between generator and body to pull cord directly towards body. Keep back straight and do not twist while pulling.	
	• Inhaling fumes from exhaust	• Never operate generator indoors or in confined areas without proper ventilation.	
	• Hearing damage: temporary or permanent hearing loss	• Wear hearing protection (plugs, caps, muff NRR > 28) to protect ears if operating generator exceeds 85 db. Post hearing protection signs to warn public and workers • Do not stand/work within 3 feet of operating generator except when starting/shutting down.	
4. Operating Generator	• Burns from hot surfaces	• Wear level three cut resistant gloves AND heavy duty over gloves. • Avoid contact with generator while it is in operation.	
	• Explosion and fire	• Do not store fuel containers in the vicinity of the generator. • Inspect fuel lines for leakage. Keep generator properly maintained. • Do not operate generator in the vicinity of combustible materials (paper, rags, clothing). (LSA 6)	
	• Electrical shock	• Dry hands before touching generator. • If you must use a generator when it is wet outside, protect the generator from moisture. Do NOT operate generator indoors. • NEVER plug generator into an electrical wall outlet (Back feeding). • Ensure generator is equipped with a Ground Fault Circuit Interrupter (GFCI). Test GFCI to ensure electrical power is interrupted. (LSA 8) • If generator is not equipped with GFCI, plug a GFCI tester into the generator followed by the electrical cord & test operation. (LSA 8) • Check that the entire length of each electrical cord is free of cuts or tears and that the plugs are not altered prior to connecting to generator. • Protect electrical cords from getting pinched or crushed. • Make sure the wattage rating for each cord exceeds the total wattage of all appliances connected to it.	
		• Inhaling fumes from exhaust	• Never operate generator indoors or in confined areas without proper ventilation.
		• Hearing damage	• Wear ear plugs if noise from operating generator exceeds 85 db. • Do not stand/work within 3 feet of operating generator except when starting/shutting down. If noise exceeds 85 db, post hearing protection signs to warn public and workers
5. Cease Generator Operation	• Electrical shock	• Dry hands before touching generator.	
	• Equipment damage	• Turn off all appliances powered by the generator and then turn off generator.	
	• Fuel Spill	• Turn off fuel valve when generator is done operating prior to transporting.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

¹ Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.

² A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."

³ Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 8
WORK ACTIVITY (Description):			
SPOTTING / MOVING EQUIPMENT			
This JLA addresses hazards associated with exclusion zones, clear traffic paths, and coordination during operation of mobile equipment and third-party vehicles. The standard Traffic Control JLA should also be used when working on public property.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Air horn			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Carl Miklich	Assistant Project Manager	Andy Nelson	Branch Manager / Senior Geologist
		Sean Gultinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input checked="" type="checkbox"/> Reflective Vest <input checked="" type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input checked="" type="checkbox"/> Safety Shoes—Type: Puncture Resistant, Electrical Hazard, Crush/Impact Resistant 75lbs.	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input checked="" type="checkbox"/> PPE Clothing—Type: Long sleeve protection required.	<input checked="" type="checkbox"/> Gloves—Type: Level 3 Cut Resistant and Puncture Resistant <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Review of work area and exclusion zones	• Equipment damage and personal injury	<ul style="list-style-type: none"> All parties must review the traffic control plan. Review and have a clear understanding of work zones, areas of third-party traffic and safety zones for employees on foot. (LSA 2) 	
2. Moving vehicle backwards	• Property damage or personal injury	<ul style="list-style-type: none"> Always use a spotter when moving a vehicle backwards. Determine the route to take prior to moving the vehicle. (LSA 2) The spotter shall discuss signals with the driver ahead of time. The spotter shall communicate by hand or radio signals with driver. Ensure spotter is equipped with air horn The driver shall obey signals from the spotter. 	
		<ul style="list-style-type: none"> A separate spotter is required for each potential point of contact between the vehicle and another structure (e.g., if backing, a 2nd spotter is required if front of vehicle may contact a structure). 	
		<ul style="list-style-type: none"> If a blind spot exists, the driver must communicate this to the spotter and not move until the spotter determines that it is safe to proceed. (LSA 2) 	
	• Property damage from vehicle hitting object due to blind spots	<ul style="list-style-type: none"> Spotter and driver should assess for third-party traffic and pedestrians prior to moving vehicle. While spotting, both the driver and spotter should communicate with pedestrians to stay clear and stop if other vehicles approach. Ensure spotter is equipped with air horn. 	
		<ul style="list-style-type: none"> A spotter must be used if vehicle is passing underneath overhead lines, unless it has been verified there is at least 3 feet (1.0 m) of clearance between the line and top of vehicle The spotter shall not allow vehicle to pass underneath any utility line with 1 foot (0.3 m) or less clearance. If clearance is 3 feet (1.0 m) or less, the driver is to restrict his speed to <5 miles per hour. 	
		<ul style="list-style-type: none"> Do not stand directly behind vehicle in the line of fire. (LSA 2) Spotter shall wear a traffic vest. Do not spot for more than one vehicle at a time. Driver shall stop if eye contact or visual contact with spotter is lost. Maintain eye contact with driver when vehicle is moving. Do not glance away for more than 1 second. (LSA 2) 	
• Property damage or personal injury due to third-party vehicles or pedestrians entering the path of the moving vehicle.	<ul style="list-style-type: none"> Spotter and driver should assess for third-party traffic and pedestrians prior to moving vehicle. While spotting, both the driver and spotter should communicate with pedestrians to stay clear and stop if other vehicles approach. Ensure spotter is equipped with air horn. 		
	<ul style="list-style-type: none"> A spotter must be used if vehicle is passing underneath overhead lines, unless it has been verified there is at least 3 feet (1.0 m) of clearance between the line and top of vehicle The spotter shall not allow vehicle to pass underneath any utility line with 1 foot (0.3 m) or less clearance. If clearance is 3 feet (1.0 m) or less, the driver is to restrict his speed to <5 miles per hour. 		
• Electrocutation or damage from striking utility line	<ul style="list-style-type: none"> A spotter must be used if vehicle is passing underneath overhead lines, unless it has been verified there is at least 3 feet (1.0 m) of clearance between the line and top of vehicle The spotter shall not allow vehicle to pass underneath any utility line with 1 foot (0.3 m) or less clearance. If clearance is 3 feet (1.0 m) or less, the driver is to restrict his speed to <5 miles per hour. 		
	<ul style="list-style-type: none"> Do not stand directly behind vehicle in the line of fire. (LSA 2) Spotter shall wear a traffic vest. Do not spot for more than one vehicle at a time. Driver shall stop if eye contact or visual contact with spotter is lost. Maintain eye contact with driver when vehicle is moving. Do not glance away for more than 1 second. (LSA 2) 		
• Fatality from being hit by vehicle	<ul style="list-style-type: none"> Spotter and driver should assess for third-party traffic and pedestrians prior to moving vehicle. While spotting, both the driver and spotter should communicate with pedestrians to stay clear and stop if other vehicles approach. Ensure spotter is equipped with air horn. 		
	<ul style="list-style-type: none"> A spotter must be used if vehicle is passing underneath overhead lines, unless it has been verified there is at least 3 feet (1.0 m) of clearance between the line and top of vehicle The spotter shall not allow vehicle to pass underneath any utility line with 1 foot (0.3 m) or less clearance. If clearance is 3 feet (1.0 m) or less, the driver is to restrict his speed to <5 miles per hour. 		
3. Repositioning Spotter	• Broken ankle from tripping	<ul style="list-style-type: none"> Never walk backwards while spotting. Inspect ground before walking, and avoid slopes, trip hazards and uneven ground. Spotter must not move while vehicle is being spotted. If spotter has to reposition, spotter shall direct vehicle to stop, turn and walk to new location, then re-establish eye contact with driver and resume spotting. 	

FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.		

Life Saving Actions

LSA 1: Prevent Falls and Dropped Objects

LSA 2: Protection from Moving Equipment and Vehicles

LSA 3: Restrict Access to Suspended Loads

LSA 4: Dig with Caution

LSA 5: Isolate Energized Equipment

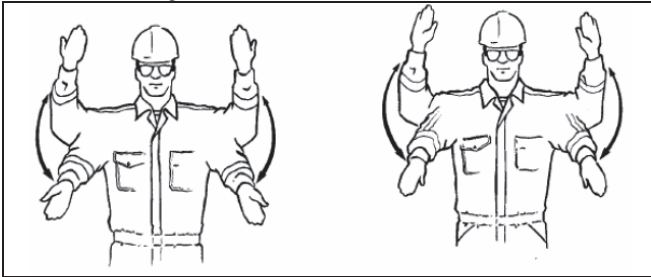
LSA 6: Prevent Hot Work Explosions/Fires

LSA 7: Establish/Maintain Safe Confined Space

LSA 8: Respect Critical Safety Devices

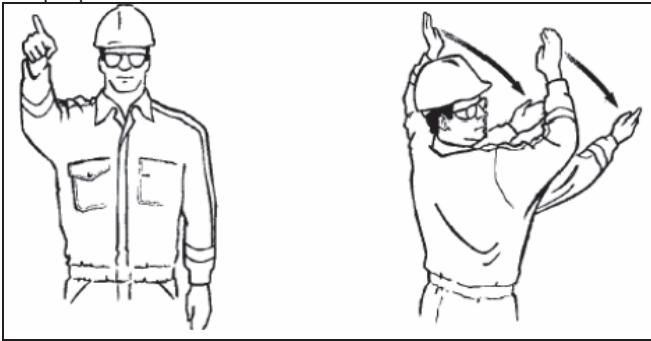
- Each Job or Operation consists of a set of steps. Be sure to list all the steps in the sequence that they are performed.
- A hazard is a potential danger. What can go wrong? How can someone get hurt? **Contact**—struck by or strikes an object; **Caught**—caught on, in, or between objects; **Fall**—falls to ground or lower level (includes slips and trips); **Exertion**—excessive strain or stress/ergonomics/lifting techniques; **Exposure**—inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught."
- Describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise, and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "Be careful" or "Use as appropriate."

BACK UP – Straight backward or forward



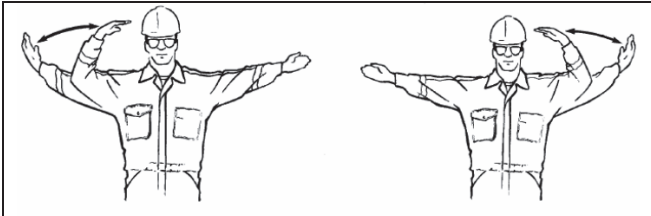
CLEAR TO LEAVE THE AREA

Show operator of equipment or vehicle it is clear of obstructions and people and is clear to leave in the direction shown.



Turn vehicle **RIGHT**

Turn the vehicle **LEFT**



STOP all movement immediately.



Distance to **STOPPING POINT**

As hands get closer together, vehicle is closer to stopping point.



Job Loss Analysis

COMPANY/PROJECT NAME or ID/LOCATION (City, State)		DATE	NEW/REVISED
Stantec		1/31/2023	<input type="checkbox"/> NEW <input checked="" type="checkbox"/> REVISED Rev # 9
WORK ACTIVITY (Description):			
TRAFFIC CONTROL AT CLIENT SECURED SITES			
This JLA addresses hazards associated with exclusion zones and clear traffic paths and coordination during operation of mobile equipment and third party vehicles at controlled sites: refinery, terminals, bulk plants. Use the standard Traffic Control JLA when working on public property.			
EQUIPMENT necessary to mitigate hazards associated with this work activity:			
Two Way Radios, Traffic Delineators, Caution Tape, Sandbags or Delineator Bases (for added weight in windy conditions)			
DEVELOPMENT TEAM	POSITION/TITLE	REVIEWED BY	POSITION/TITLE
Geoffrey Waterhouse	Senior Project Geologist	Sean Guiltinan	SSH&E Program Manager
		Andrew Whitman	Senior Staff Scientist
		Jens Walker	Senior Staff Geologist
MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (SEE CRITICAL ACTIONS FOR ADDITIONAL STEP-SPECIFIC REQUIREMENTS)			
<input type="checkbox"/> Reflective Vest <input type="checkbox"/> Hard Hat <input type="checkbox"/> Lifeline/Harness <input type="checkbox"/> Safety Glasses	<input type="checkbox"/> Goggles <input type="checkbox"/> Face Shield <input type="checkbox"/> Hearing Protection <input type="checkbox"/> Safety Shoes—Type:	<input type="checkbox"/> Air purifying respirator <input type="checkbox"/> Supplied respirator <input type="checkbox"/> PPE Clothing—Type:	<input type="checkbox"/> Gloves—Type: <input type="checkbox"/> Other—Specify: _____
REMINDER: Complete an LPSA at start of, and continuously throughout, job/task to identify additional and/or changing hazards to act on.			
¹ JOB STEPS	² POTENTIAL HAZARDS	³ CRITICAL ACTIONS TO MITIGATE HAZARDS	
1. Pre-Traffic Control Set Up Health and Safety Meeting / General Site Activities.	• Miscommunication between workers causing accident involving equipment and/or personnel injury	• All employees assigned to this task will attend a pre-construction health and safety meeting, which will include review of the traffic control plan. Clear understanding of work zones, areas of third party traffic and safety zones for employees on foot will be reviewed and understood.	
2. Observe work zones for excessive speed, and third-party vehicles	• Excessive speed leads to vehicle overturn, loss of control.	• Contact operator using handheld radio and request immediate slow down. Follow all posted controlled site speed limits. If not posted, speed limit shall be 15 mph. (LSA 2)	
	• Operator or contractor crashes into vehicles.	• Verify vehicle signal equipment is working: lights, turn signals and horns. • Stop vehicle when operator of other vehicle comes within 100 yards of operating vehicle. (LSA 2)	
	• Movement of traffic control devices from moderate / high wind conditions.	• Always bring additional weight (i.e. sand bags / delineator bases) • Estimate wind speed and direction. If wind gusts approach 25 mph, add a minimum of 24 lbs. (two delineator bases) of additional weight.	
	• Possible additional factors (pot holes, traffic speed, construction activity) that could pose additional hazards associated with lane closure.	• If additional factors identified in the field, STOP WORK. Make adjustments to lane closure/traffic control to mitigate the hazards associated with the additional factors.	
3. Driving angles and surfaces	• Vehicle roll-over and being stuck. Personnel injured in roll-over or trying to free stuck vehicle.	• Verify driving conditions on exposed soil. If soil is too soft, do not drive vehicles onto exposed soil.	
FIELD CHANGE SECTION: Document Job Steps, Potential Hazards, and Critical Actions to Mitigate Hazards seen during operations.			

Life Saving Actions

- LSA 1: Prevent Falls and Dropped Objects
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ExxonMobil ADC
Stantec 203722941.HASP.2024

APPENDIX F
PERSONAL PROTECTIVE
CLOTHING/GLOVES INSPECTION,
DONNING, AND DOFFING
PROCEDURES

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Personal Protection Clothing, Glove Inspection, and Donning and Doffing Procedures

Donning Non-Encapsulating Garments

1. Conduct a visual inspection of the garment before you begin donning: -garment should be free of discoloration, alterations or physical damage -inner gloves should be fully inserted into outer gloves
2. Remove all jewelry and personal items (pens, key rings, badges, pagers, knife cases, etc.) that might damage the garment.
3. Check function of respirator and place nearby donning location.
4. Visually check size and condition of outer boots and place nearby.
5. Open the garment closure completely.
6. Read the garment size label to assure proper fit.
7. Apply anti-fog to inside of visor, if present.
8. Remove your shoes. If the garment has attached socks, these socks are worn inside outer chemical boots. These socks do not have adequate durability or slip resistance to be worn as the outer footwear covering.
9. While sitting, insert your feet into the garment legs and down into socks, if so equipped. Stretch your legs out to maximum extension while pulling garment up around hips.
10. If the garment has outer boot top covers, pull the boot top covers up, and don outer boots. Then pull boot top cover down over boots as far as possible. If the garment does not have socks, pull the garment cuff up before donning the boot, then pull the cuff down over the outside of the boot.
11. Place one hand in the sleeve and pull the garment sleeve to your shoulder. Make sure your hand is securely inside the glove, if attached.
12. Place your other hand in the sleeve and glove, if attached, and pull the garment over that shoulder.
13. If gloves are not attached to the garment, don the gloves. Pull the sleeves of the garment over the gauntlet of the gloves. Do not rely upon taping to provide a liquid-tight seal. Taping should only be used to hold the sleeve in position over the glove gauntlet. If a leak-proof seal between the glove and sleeve is required, then you should wear a garment with attached gloves.
14. Don your respirator facepiece and check its function. If using an SCBA, disconnect the air supply from the facepiece, if possible, to save air supply.
15. Don protective headgear, if it is worn underneath the garment hood, and communication equipment.
16. Place the attached hood, if present, over your head and close the zipper.
17. After checking that the zipper is completely closed, fold and secure the flaps over the closure.
18. In the case of an air-line breathing system, complete all connections and adjustments.
19. Connect your respirator facepiece to the air supply and make sure the respirator is functioning properly.
20. If applicable, place the separate hood over your head and attach the underarm straps.

Doffing Non-Encapsulating Garments

Gross decontamination and removal of all personal protective equipment will be performed before leaving the site. Contaminated clothing will be carefully removed to minimize the dislodgment of particulate and collected in a drum for disposal. Respiratory protection will be kept on until the removal of contaminated clothing has been completed.

Shaking or blowing dust or other materials off potentially contaminated clothing or equipment to remove dust or other materials is not permitted. If dust removal is required, a vacuum cleaner designed for the removal of toxic materials and outfitted with high efficiency particulate filtration (HEPA) that is 99.97 percent efficient against particles of 0.3 micron size or larger.

1. If your garment has been contaminated or is suspected of being contaminated, you must first undergo field decontamination.
2. After field decontamination, if the garment has been contaminated or is suspected of being contaminated, you should continue to use your respirator until the garment has been doffed and removed.
3. An assistant should help you doff the garment after field decontamination. If your garment has been contaminated, your assistant should wear protective clothing and respiratory equipment.

4. Remove and discard the separate outer hood if present.
5. If you are wearing an SCBA or PAPR, your assistant should help you remove the backpack or filter unit without disconnecting the facepiece. The tank or filter unit should either be held by another person or placed in a dry, secure position. While you stand, your assistant should partially open the closure of your garment, pull down the hood, open the closure completely, and peel the garment down and away from your shoulders. The assistant should help you remove your arms from the sleeves.
6. Your assistant should lower the garment below your the hips without touching the inside of the garment.
7. While sitting, your assistant should help you remove your boots, pull the garment off your legs, and take the garment away.
8. Once the garment has been removed, you can disconnect and remove the respiratory facepiece.

DoFFing Chemical Resistant Gloves

Using the Personal Protective Equipment (PPE) correctly is another link in the chain of keeping a person safe. If the PPE is not worn or used correctly then it may not offer the expected protection to the user. Below are guidelines for putting on (donning) and removing gloves (doFFing).

Donning Gloves

1. Wash hand before putting gloves on.
2. Remove all jewelry from hands.
3. Pick up one glove with the right hand
4. Line the thumb side of the glove up with the thumb side of the left hand
5. Slip the open end of the glove over the left hand and thumb
6. Stretch the palm side of the glove with the right hand, pulling the glove on to finger level.
7. Position the fingers of the glove in line with the fingers of the left hand.
8. Pull the remainder of the glove onto the left hand.
9. Pick up the second glove with the gloved left hand.
10. Line the thumb side of the glove up with the thumb side of the right hand.
11. Slip the open end of the glove over the right hand and thumb.
12. Stretch the palm side of the glove with the left hand; pull the glove on to finger level.
13. Position the fingers of the glove in line with fingers of the right hand.
14. Pull the remainder of the glove onto the right hand.
15. Proceed with activity requiring gloves.



DoFFing Gloves

There are two standard methods to taking off gloves. Method One for glove removal is recommended, because it is harder for a person to become contaminated. However, if Method Two can be done without causing contamination, use the easiest method. Below are both methods.

Method One:

1. Grasp one of the gloves and cuff and pull it partway off. The glove will turn inside out. It is important to keep the first glove partially on your hand before removing the second glove. This protects you from touching the outside of either glove with your bare hands.
2. Leaving the first glove over your fingers, grasp the second glove near the cuff and pull it part of the way off. The glove will turn inside out. It is important to keep the second glove partially on your hand to protect you from touching the outside surface of the first glove with your bare hand.
3. Pull off the two gloves at the same time, being careful to touch only the inside surfaces of the gloves with your bare hands.
4. Dispose of the gloves properly in accordance with waste disposal regulations.
5. Wash hands thoroughly

Method Two:

1. Grasp outside edge near wrist.
2. Peel away from hand turning glove inside out.
3. Hold in opposite gloved hand.
4. Slide ungloved finger under the wrist of the remaining glove, be careful not to touch the outside of the glove.
5. Peel off from inside, creating a bag for both gloves
6. Discard
7. Wash hands thoroughly



Do's and Don'ts of Glove Use

1. Work from clean to dirty—this will help prevent contamination
2. Don't touch your face or adjust PPE with contaminated gloves
3. Change gloves when heavily soiled or if they are torn.
4. Discard gloves after use, never wash or reuse disposable gloves.

References

Donning and Doffing non-encapsulating garments instructions obtained from DuPont Personal Protective Equipment, June 2007

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APPENDIX G
HEAT STRESS PROTOCOL AND
PREVENTION PLANS

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Heat Stress Protocol

If the ambient air temperature is above 80 degrees F, the need for heat stress and heat exhaustion monitoring will be evaluated. Heat stress and heat exhaustion monitoring will be required if the temperatures exceed 90 degrees F. Heat stroke is a life-threatening situation in which the victim's temperature control system, which produces sweating to cool the body, stops working. Body temperature can rise quickly to elevations causing brain damage and death. Heat exhaustion is less dangerous and results from the loss of body fluids. This fluid loss causes blood flow to decrease in vital organs resulting in a form of shock. High humidity (>70% relative humidity) may retard evaporation resulting in inadequate cooling of the body. Heat cramps are muscular spasms due to heavy exertion. These cramps usually involve the abdominal and leg muscles and are due to the loss of water and salt from heavy sweating.

Severity	Signs/Symptoms	First Aid
Heat Fatigue	<ul style="list-style-type: none"> > Early warning sign of heat stress > Too tired and weak to concentrate on doing work 	<ul style="list-style-type: none"> > Move to cool place > Drink water every 15 minutes
Heat Cramps	<ul style="list-style-type: none"> > Develops when a person sweats out more salt than the body take in and the muscles cramp 	<ul style="list-style-type: none"> > Move to cool place > Drink water every 15 minutes > Gatorade can help replace necessary salt
Heat Exhaustion	<ul style="list-style-type: none"> > Cool, pale, moist skin > Heavy sweating > Normal body temperature > Dilated (large) pupils > Headache and nausea > Dizziness and vomiting 	<ul style="list-style-type: none"> > Move to cool area > Have victim lie down > Slightly elevate feet > Loosen clothing > Apply wet towels > Give a glass of water every 15 minutes
Heat Stroke	<ul style="list-style-type: none"> > Hot, red skin > Constricted pupils > High body temperature > Little or no perspiration > Chills, confusion, and strong rapid pulse 	<ul style="list-style-type: none"> > Call EMS (911) > Check ABCs (airway, breathing, circulation) > Immerse in cool water > Wrap in wet towels > Give nothing by mouth

Be sure there is adequate shade at or near the site for employees to rest. Have two gallons of water (or electrolyte solution/Gatorade) per employee at the site. Encourage employees to drink plenty of fluids and implement the following break schedule:

- > Work for 1 to 1.5 hours.
- > Break for 15 minutes.
- > Count the radial pulse of all personnel for 30 seconds (and multiply by 2 to get beats per minute) at the beginning of the break period.
- > If the heart rate exceeds 110 beats per minute (BPM), shorten the next work cycle by 1/3 and keep the rest periods at 15 minutes.
- > If the heart rate exceeds 110 BPM at the next rest period, shorten the next work cycle by 1/3 again, keeping the 15-minute breaks.
- > If the heart rate ever exceeds 120 BPM, the employee will be required to rest for 30-45 minutes to allow the heart rate to decrease.

The Site Supervisor will institute these procedures and monitor employees for signs of heat stress. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries.

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Personal Heat Strain Prevention Plan

Name: _____

Date: _____

Today's Forecast: Temp _____ RH% _____ WBGT _____ Direct Sun? _____ Radiant Source? _____

Scheduled cool breaks required today? Yes _____ No _____

Cool breaks to occur every: ___ Hour for ___ Minutes

Am I acclimatized to hot work? Yes _____ No _____

Acclimatized means you have had at least four to seven days of progressive exposure to work in a hot environment (e.g., 50% exposure on day one, 60% on day two, 70% on day three, 80% on day four, 90% on day five, and 100% on day six). Acclimatization can be sharply reduced with as little as three days away from hot work and must be built up again. A "No" answer means you are at higher risk for heat strain and must be extra vigilant in managing your heat exposure, risk factors, fluid replacement, and cool breaks. Be alert and take action at the first sign of muscle cramps, dizziness, lightheadedness, headache, weakness, confusion, upset stomach, vomiting, or decreased or dark colored urine.

Other risk factors present? Age; obesity; use of alcohol, caffeine, medications, or recreational drugs; blood donation or menstruation; use of dark or tight clothing; PPE; hot meals or drinks; heavy physical labor; and extended work shifts are risk factors for heat strain. With each additional risk factor you are at higher risk for heat strain. Avoid personal choices that increase risk and be extra vigilant when risk factors are present.

Goal -- Drink about 1 cup (8 oz.) of cool water every 15 to 20 minutes. Start drinking 1 to 2 hours before hot work begins. Track progress to goal and cool breaks here.

Time	Fluid Type	Cups Consumed	Cool Break Time (minutes)	Time	Fluid Type	Cups Consumed	Cool Break Time (minutes)
6:00 AM				1:00 PM			
6:20 AM				1:20 PM			
6:40 AM				1:40 PM			
7:00 AM				2:00 PM			
7:20 AM				2:20 PM			
7:40 AM				2:40 PM			
8:00 AM				3:00 PM			
8:20 AM				3:20 PM			
8:40 AM				3:40 PM			
9:00 AM				4:00 PM			
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10:00 AM				5:00 PM			
10:20 AM				5:40 PM			
10:40 AM				5:40 PM			
11:00 AM				6:00 PM			
11:20 AM				6:20 PM			
11:40 AM				6:40 PM			
12:00 PM				7:00 PM			
12:20 PM				7:20 PM			
12:40 PM				7:40 PM			

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Project High Heat Illness Prevention Plan

To be completed when the HSI Temp is expected to reach the “Extreme Caution” level (see Heat Stress Index Table in Section 10.5.5 of the HASP).

Project Name: _____ Location: _____ Date: _____

Temperature at Tailgate Meeting: _____ °F Forecasted High Temperature: _____ °F

Work should be scheduled to avoid high heat conditions including heat waves, work in typically hot areas during summer months, or work in especially hot environments or times of day whenever possible.

Prior to work commencing, verify that employees are knowledgeable in recognizing heat-related illnesses (review Appendix G, Heat Stress Protocol), understand emergency protocols, have ample supplies of water and shade canopies, and understand the requirements outlined in the following table.

Temperature	Required Actions	Completed	N/A
Below 80°F	Have water readily accessible for all site workers (enough for 1 quart per hour of work per employee)		
	Provide Shade upon request		
At 80°F and above	Shade Up! Erect canopy/shade if not already available		
	Encourage frequent rest and water breaks		
	Review/verify employee acclimatization		
At 95°F and above	Stop Work to review Heat Stress Protocol:		
	A) Verify all site workers ready/alert level(s)		
	B) Implement Personal Heat Strain Prevention Plan		
	C) Assign worker monitors (close monitoring required)		
	D) Ensure reliable communication is in place		
	E) Review heat-related emergency response plans		
	F) Consider PPE and Direct Sun in Heat Index chart		
G) Discuss the continued Scope of Work			
At 105°F (Heat Index) and above	Contact your Corporate Health and Safety Coordinator to ensure any continued work is closely monitored and approved		

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APPENDIX H
COLD STRESS PROTOCOL

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Cold Stress Protocol

If the ambient air temperature is below 50 degrees F in wet conditions, or if the field employee feels cold, the need for cold stress monitoring will be evaluated. Cold stress, hypothermia and frostbite monitoring will be required if the temperatures fall below 50 degrees in wet conditions. Cold stress is a life-threatening situation in which the victim's temperature control system, which regulates blood flow and inner core body temperature, makes adjustments to protect vital organs when exposed to prolonged cold and/or wet conditions. Body temperature can fall quickly to elevations causing hypothermia, frostbite, and death.

LAYERED CLOTHING SYSTEM

Select the proper type and amount of clothing. Regulate your clothing according to your activity rate. This is the most effective way to ensure comfort. Pay attention to your bodies' signals. Do not wait until you are cold to put on more clothing. Act when you first begin to feel cooler.

Clothing Layers	
<ul style="list-style-type: none"> > Long, thermal underwear > Polypropylene shirt or inner layer > Sweater, light jacket > Wind or rain gear > Long, thermal underwear > Polypropylene, wool, or wool blend inner pants > Wind or rain pants > Gloves and mittens 	<ul style="list-style-type: none"> > Wicking inner socks polypropylene > Insulating socks wool or wool blend > Boot liners insulated insoles > Footwear, steel-toe boots waterproofed > Head coverings >

TYPES OF COLD

Percent Deficiency	Symptoms
Wet cold: 50° F to 14° F	This is the most dangerous range. Wide temperature variations from melting during the day to freezing at night makes proper dressing difficult, and important. Damp conditions from melting snow or rain makes keeping dry difficult.
Dry cold: 14° F to -20° F	The ground is frozen and snow is dry and crystallized. Strong winds cause the most concern with keeping warm. Extra clothing layers and wind-proof outer garments should be added.
Arctic cold: below -20° F	This range requires the most insulation and wind proofing. Many materials change physical properties, becoming brittle. Do not work in these conditions.

LOSS OF BODY HEAT

HOMEOSTASIS

This is the body's process for maintaining an even temperature. The arms and legs are used as a radiator to remove excess heat from the body. This process dilates the blood vessels, allowing more blood to flow to the skin surfaces. When the body temperature drops, these blood vessels constrict, decreasing blood flow, and thereby, heat loss. This is why hands and feet get numb when cold, and why they are particularly vulnerable to frostbite. Since your brain needs oxygen to function, your body cannot cut off the flow of blood to your head in order to conserve heat. Consequently, much of your body heat can be lost through an uncovered head and neck.

Radiation is the reason for up to 55% reduction of heat loss. Heat is lost directly from exposed skin and the head. The head may lose up to one-half of the body's total heat production at 40 degrees F, and up to three-quarters at 5 degrees F.

Evaporation is the reason for up to 21% reduction of heat loss. This loss is caused by evaporation of sweat and moisture from the skin. Lung exhalation also produces substantial heat loss. There is little that can be done about this. We need to allow for this by using breathable fabrics to allow this moisture to pass out freely.

Conduction (along with convection) is the reason for up to 15% reduction of heat loss. This is caused by skin contact with cold objects, primarily the hands, and wet or tight clothing. Handling gasoline, and other super-cooled liquids, at low temperatures is especially dangerous.

Convection is the heat loss caused by the wind carrying away heat from the surface of the skin. This includes wind-chill effects. Respiration causes 2-9% of heat loss. This is caused from inhaling cold air and exhaling warm air.

COLD WEATHER FIRST AID

DEHYDRATION

Excessive loss of body water impairs the ability to reason, so the victim may not react properly.

Prevention:

- > Drink at least 2 quarts of water a day.
- > Increase fluid intake at first signs of darker yellow urine
- > Avoid dehydrating foods (high protein) and fluids (coffee, caffeine)

Symptoms:

Percent Deficiency	Symptoms
1 to 5 %	<ul style="list-style-type: none"> > Increased pulse rate > Nausea and loss of appetite > Dark urine or constipation > Irritability, fatigue > Thirst
6 to 10 %	<ul style="list-style-type: none"> > Headache / dizziness > Labored breathing > Tingling > Absence of salivation > Inability to walk > Cyanosis (bluish or grayish skin color)
11 to 20 %	<ul style="list-style-type: none"> > Swollen tongue, inability to swallow > Blurred vision, deafness > Shriveled, numb skin > Painful urination > Delirium, unconsciousness, and death

Treatment:

- > Mild cases - drink liquids and keep warm.
- > More severe cases require professional medical treatment.

HYPOTHERMIA

This is the lowering of the inner core temperature of the body. This can and usually does happen above freezing. The victim may not recognize the symptoms and may not be able to think clearly enough to react. Injury or death may result.

Hypothermia	
Predisposing Conditions	<ul style="list-style-type: none"> > Poor physical condition > Inadequate nutrition and water intake > Thin build > Non-protective clothing

Hypothermia	
	<ul style="list-style-type: none"> > Getting wet > Inadequate protection from wind, rain and snow > Exhaustion
Symptoms	<ul style="list-style-type: none"> > Loss of ability to reason > Shivering > Slowing, drowsiness, fatigue > Stumbling > Thickness of speech > Amnesia > Irrationality, poor judgment > Hallucinations > Cyanosis (blueness of skin) > Dilation of pupils of eyes > Stupor > Decreased heart/respiration rate
Treatment	<ul style="list-style-type: none"> > Shelter the victim from wind and weather > Insulate the victim from the ground > Change wet clothing > Put on windproof, waterproof gear > Increase exercise, if possible > Wrap in blanket > Give hot drinks > Follow with candy or other high-sugar foods > Apply external heat > Huddle for body heat from others > Place victim in a tub of 105° F water, never above 110° F
Prevention	<ul style="list-style-type: none"> > Keep rested, maintain good nutrition > Consume plenty of high-energy food > Use proper clothing > Discontinue working if tired > Get plenty of exercise. Do not sit around much > Watch each other for signs > Take immediate corrective action for any signs

FROSTBITE

This is tissue injury involving the actual freezing of the skin and underlying tissues. Recovery is slow, severe frostbite can lead to gangrene. Once exposed, the victim will be predisposed to frostbite in the future.

Hypothermia	
Predisposing Conditions	<ul style="list-style-type: none"> > Prolonged exposure to temperatures 32° F or below > Brief exposure at extremely low temperatures, -25° F and below > Exposed body parts > Restriction of circulation > Fatigue, poor nutrition, low liquid intake, poor physical condition > Previous case of frostbite or other cold injury
Symptoms	<p>First Degree (Frostnip)</p> <ul style="list-style-type: none"> > Redness, pain, burning, stinging or prickly sensation. > Pain disappears and there is a sudden blanching of the skin. > The skin may look mottled. > Skin is firm to the touch, but resilient underneath. > On thawing, there is aching pain or brownness. Skin may peel off, and the part may remain cold for some time.

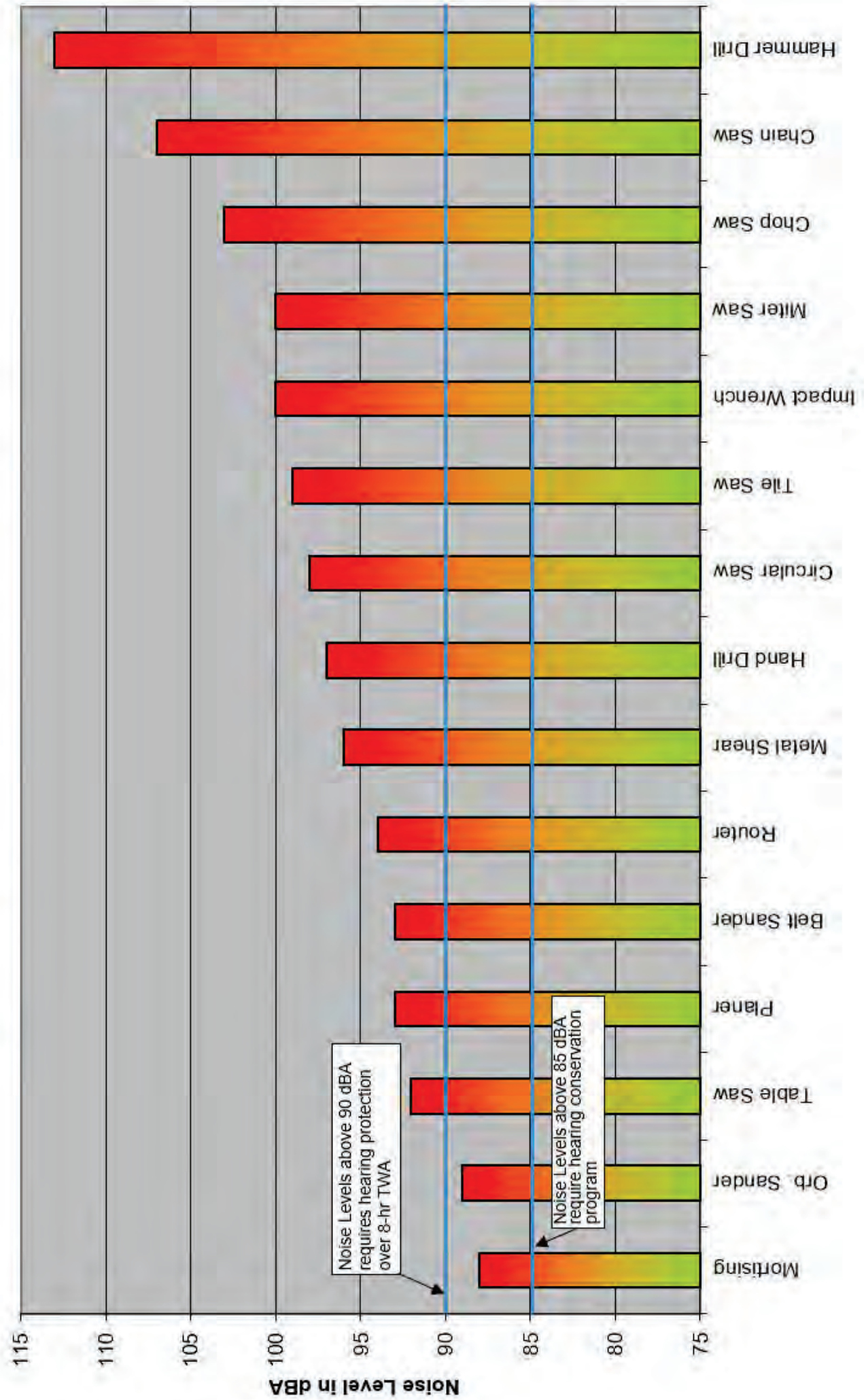
Hypothermia	
	<p>Second Degree (Superficial Frostbite, Frostbite)</p> <ul style="list-style-type: none"> > No pain, the part may feel dead > Numbness, hard to move the part > Tissue and layers underneath are hard to the touch > After thawing (takes 3 to 20 days) pain, large blisters, sweating > Black or discolored skin sloughs off, leaving tender new skin <p>Third degree (Severe Frostbite)</p> <ul style="list-style-type: none"> > Full thickness of the skin is involved > After thawing, pain continues for 2 to 5 weeks <p>Fourth degree (Severe Frostbite)</p> <ul style="list-style-type: none"> > Skin and bone are frozen > Swelling and sweating occur > Gangrene may develop, amputation may be necessary.
Treatment	<ul style="list-style-type: none"> > Do not rub affected area with snow. Hold it over fire, or use cold water to thaw it. > Exercise the affected area to promote blood circulation > Use any warmth available to thaw area > Do not attempt to thaw frostbitten limbs in the field. It is less harmful for the victim to walk out on a frostbitten limb than to thaw it in the field. Thawing only risks additional injury and the victim will be in too much pain to walk > Check for hypothermia > For more severe cases refer to instructions that are more complete
Prevention	<ul style="list-style-type: none"> > Proper clothing > Good nutrition, drink water, maintain core temperature > Use buddy system to check face, nose, and ears > Immediate treatment of minor symptoms > Do not work in cold conditions, if it can be avoided

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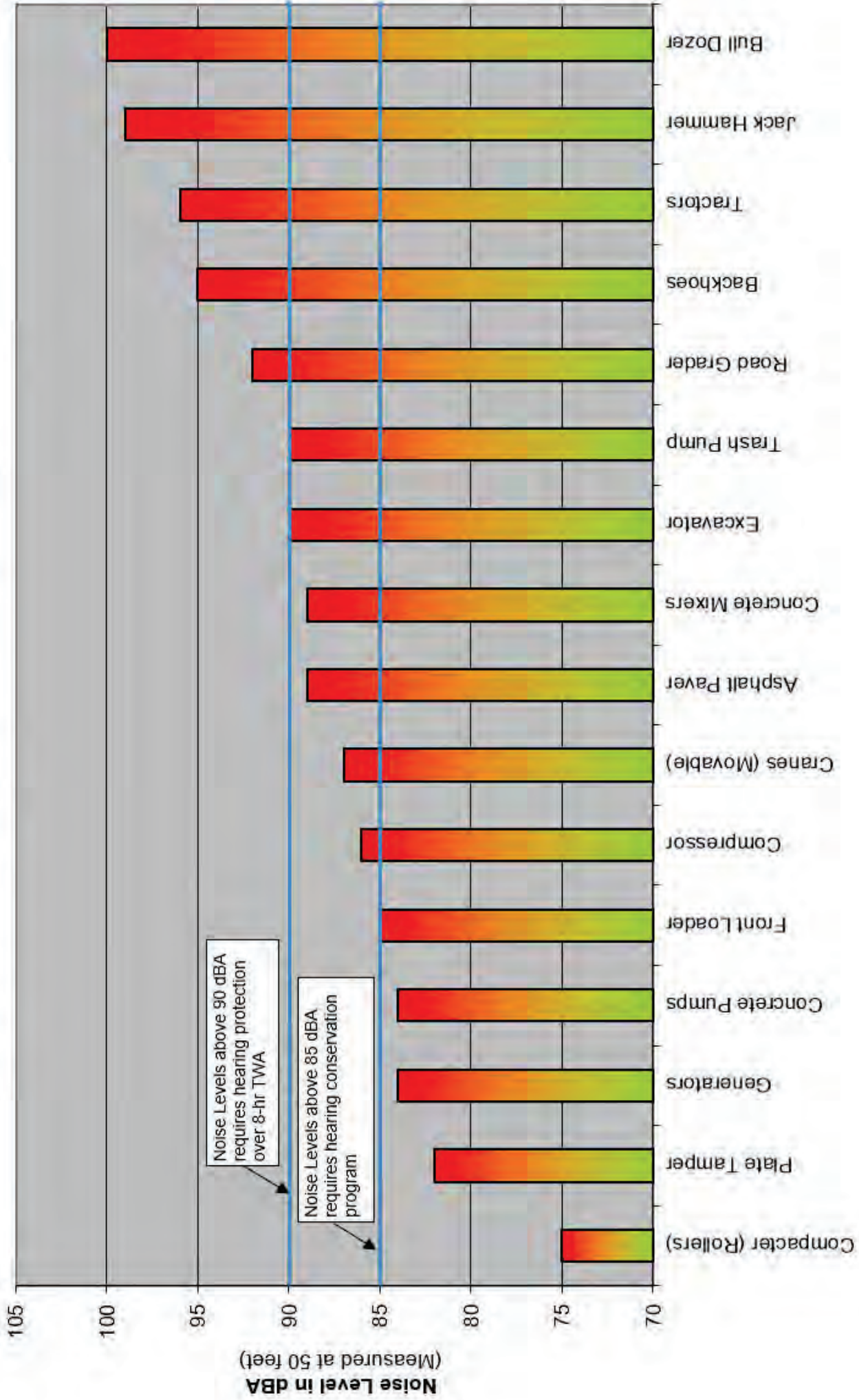
APPENDIX I
TYPICAL NOISE LEVEL
MEASUREMENTS FROM
CONSTRUCTION-RELATED
EQUIPMENT

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Noise Levels From Typical Construction Hand Tools



Noise Levels From Typical Construction Heavy Equipment



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APPENDIX J
CARE MANAGEMENT FORMS

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Overview

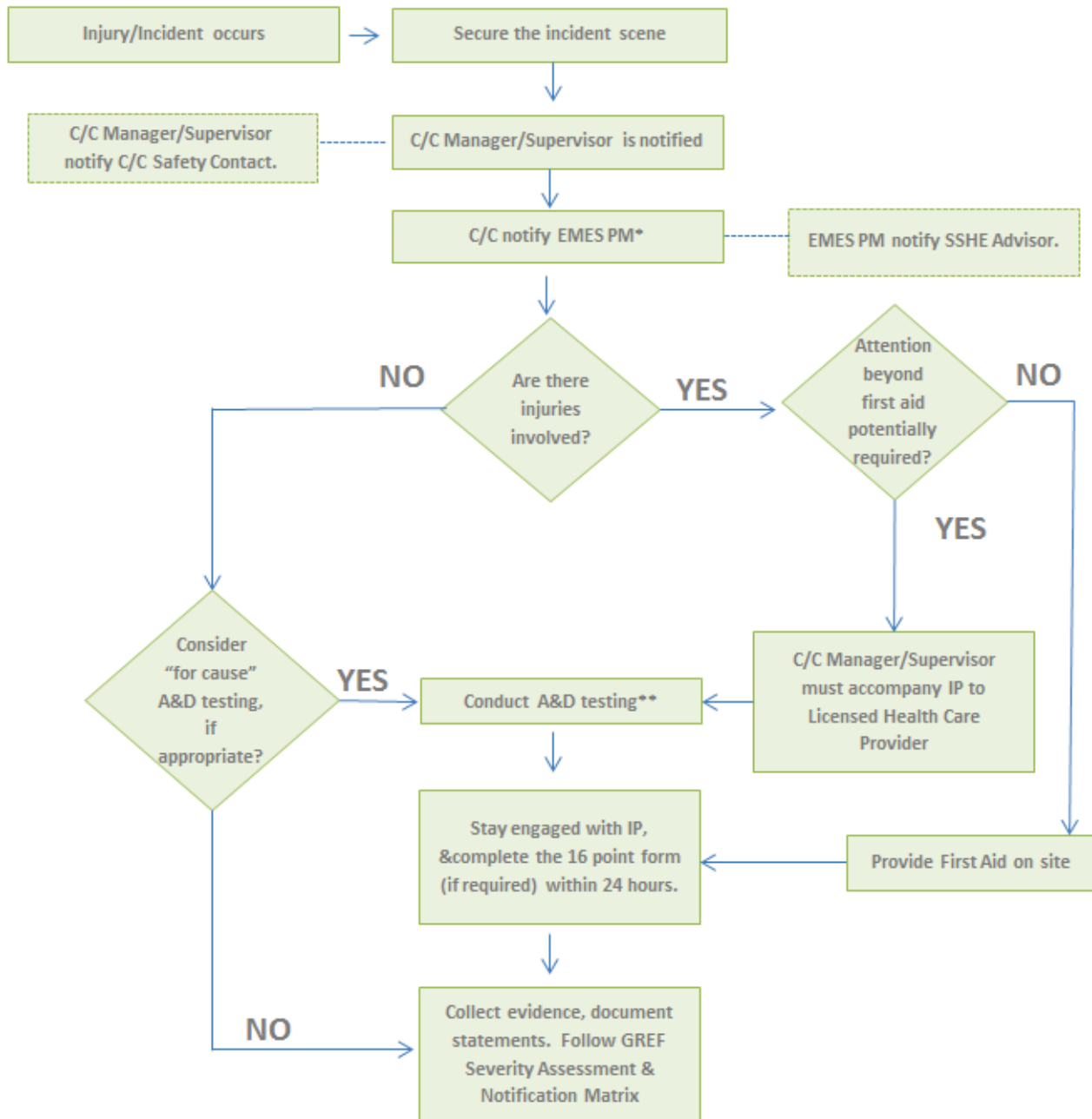
This GREF EMES Incident Go Book is a collection of standards and guidelines to provide effective and immediate Case Management.

The overall objective of this document is to provide a quick reference to contractor companies in identifying the most important information and forms to be used during the Case Management process.

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Contractor Alcohol and Drug Post-Incident Form	7
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INCIDENT RESPONSE FLOWCHART



* PM will determine additional management requirements for notification, investigation, reporting and request resources if required.

** See Alcohol and Drug Use Policy Guidelines.

Supervisor Case Management Checklist

This checklist can be used to provide guidance during a safety incident **requiring an injured person to be taken to a medical clinic.**

Supervisor Care Management Checklist

- 1 Investigate **all** reports of injuries and illnesses (including ergonomics, pain or discomfort, sprains, muscle strains/pulls).
- 2 Ensure site environment is safe and secure.
- 3 Get **prompt, adequate** and **appropriate** medical care for the injured person (IP).
- 4 Accompany the IP to a medicine and occupational health's (MOH's) or contractor's designated medical facility (contractor supervisors to accompany their workers).
- 5 Support the worker during this stressful and confusing time.
 - 5a Does IP have any known pre-existing conditions or allergies identified or likely?
 - 5b Reinforce the availability of restricted work opportunities.
When at the clinic (with consent of the injured person) document medical provider instructions, ask clarifying questions and make the doctor aware of the availability of restricted work options
 - 5c Follow all medical information privacy laws.
 - 5d Remain with the IP until released and with your manager's approval.
 - 5e Test for alcohol and drugs, if appropriate and consistent with local laws, human resources (HR) and management procedures
- 6 Contact SSH&E advisor by phone, as soon as possible.
- 7 Contact functional manager. Follow unit's incident notification matrix based on incident severity.
- 8 Contractor's supervisors to inform ExxonMobil managers of incidents on ExxonMobil premises.
- 9 All contact should be via phone and follow-up with email (if available); escalate as required to make certain verbal ExxonMobil contact has occurred (no voice mail message).
- 10 If the IP is treated at an urgent care facility, contact MOH or contractor's designated medical facility as soon as possible to schedule a follow-up exam.
- 11 Inform IPs that if they need/want further medical assessments they are to keep the supervisor and MOH informed. Contractor IPs should know to keep their company management informed and be engaged with that company's occupation medical clinic.
- 12 Conduct incident investigation and root cause analysis per site behavior-based safety system and take photographs of the site and equipment if appropriate.
- 13 Report the incident in IMPACT.
- 14 Maintain ongoing communications with the IP and management.

Return to Work

- 1 A "return to work" evaluation by MOH or contractor's equivalent medical facility needs to be completed BEFORE return-to-work (if applicable).
- 2 Outline work activities per any medical recommendations.
- 3 Monitor worker compliance of follow-up medical treatments and work restrictions.
- 4 Document completion of medical treatments and/or removal of restrictions.

IIHL 14 First Aids

The following is a complete list of all treatments considered first aid.

First Aid Treatments	
1.	Using a nonprescription medication at nonprescription strength (for medications available in both prescription and non-prescription strengths, a recommendation by a physician or other licensed health care professional to use the non-prescription medication at prescription strength is considered medical treatment for record keeping purposes)
2.	Administering tetanus immunizations (Other immunizations, such as Hepatitis B vaccine or rabies vaccine, are considered medical treatment)
3.	Cleaning, flushing or soaking wounds on the surface of the skin
4.	Using wound coverings such as bandages, Band-Aids™, gauze pads, etc., or using butterfly bandages or Steri-Strips™ (other wound closing devices such as sutures, staples, tapes/glues, etc., are considered medical treatment)
5.	Using hot or cold therapy (e.g., compresses, soaking, whirlpools)
6.	Using any non-rigid means of support, such elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment for record keeping purposes)
7.	Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.)
8.	Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister
9.	Using eye patches
10.	Removing foreign bodies from the eye using only irrigation or a cotton swab
11.	Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means (procedures involving the excision of the outer layer of the skin are considered medical treatment)
12.	Using finger guards
13.	Using massages (physical therapy or chiropractic treatment is considered medical treatment)
14.	Drinking fluids for relief of heat stress

These are **NOT** Recordable Injuries

GRAF Recordability IHL

Effective 1 Jan 2012 - 31 Dec 2015 (Rev 3.A)

First Aids and Medical Treatments (Prescription Medications)

PREScription MEDICATION

In the case of prescription medications, medical treatment occurs when a prescription is issued (even if the employee does not fill the prescription or take the medication).

- The single dosages that are considered prescription strength for four common over-the-counter drugs are:
 - Ibuprofen (such as Advil™) - Greater than 467 mg
 - Diphenhydramine (such as Benadryl™) - Greater than 50 mg
 - Naproxen Sodium (such as Aleve™) - Greater than 220 mg
 - Ketoprofen (such as Orudis KT™) - Greater than 25mg
- To determine the prescription-strength dosages for other drugs that are available in prescription and non-prescription formulations, consult the U. S. Food and Drug Administration website at: <http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm>
- If a LHCP provides prescription samples in lieu of prescription recommendation or script, the samples are to be recorded as a prescription.

Medical Treatment Includes: (RECORDABLE)

- All work-related **needle stick injuries** and cuts from shard objects that are contaminated with another person's blood or other potentially infectious material must be recorded.
- Cases involving work-related **hearing loss**.
- Occupational exposure to anyone with a known case of active followed by a tuberculosis infection as evidenced by a positive skin test or diagnosis by a physician or other LHCP.
- Other incidents as defined under medical treatment (such as employee performing Heimlich maneuver, CPR or using AED).
- Vaccines: Hepatitis B, Rabies.
- Wound closing devices: sutures, staples, tapes/ glue.
- Rigid devices used to immobilize / support parts of the body.
- Procedures used to remove the outer layer of skin.
- Physical therapy.
- Chiropractic treatment.

Medical Treatment DOES NOT include: (Not recordable)

- Visits to a physician or other LHCP solely for observation or counseling.
- The conduct of diagnostic procedures, such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g., eye drops to dilate pupils.)
- Delivery of Oxygen when it is administered solely as a precautionary measure to an employee that did not exhibit signs or symptoms of illness or injury.

Questionnaire for Alcohol and Drug (A&D) Testing

Test for alcohol and drugs, if appropriate and consistent with local laws, human resources (HR) and management procedures. This questionnaire should be used to document and confirm whether a Contractor should have a post-incident alcohol and drug test.

1. Immediately after a work-related incident occurs, the responsible Contractor supervisor should confirm whether the performance of one or more contract personnel contributed to the incident.
2. The responsible Contractor supervisor should complete the Contractor Alcohol and Drug Post-Incident Form (**Attachment 1**) to determine whether the Contractor(s) should be A&D tested.
3. The Contractor Alcohol and Drug Post-Incident Form (Attachment **1**), if properly filled out, leads the supervisor to the proper actions as follows:
 - a. Questions 1, 2, and 3 determine if this is a significant incident.
 - i. If it is not significant (“No” is answered to Questions 1, 2, and 3), NO alcohol and drug test is required. The form does not need to be completed.
 - ii. If it is significant, go to Question 4.
 - b. Question 4 asks if a Contractor was directly or indirectly involved.
 - i. If “No,” then alcohol and drug testing is NOT required. No further action is required.
 - ii. If “Yes,” then Alcohol and Drug testing is required.
 - c. The responsible Contractor supervisor is required to perform the following five steps **PRIOR TO RELEASING** an individual for A&D testing:
 1. Identify all Contractors involved in the incident.
 2. Each Contractor involved should be informed by his or her Contractor supervisor that a drug and alcohol test is required by ExxonMobil.
 3. Any individual(s) sent for testing must sign the alcohol and drug testing consent form. Each Contractor firm should have a consent form available and printed on company letterhead available.
 4. Remove individual’s badge and deliver to site/facility security or an ExxonMobil contact.
 5. Send individual to testing facility per Contractor firm’s Alcohol and Drug testing procedure.
 - d. Sign the form and send to the ExxonMobil EMES Project Manager for review.

Attachment 1

Contractor Alcohol and Drug Post-Incident Form

Incident Date [Click here to enter text.](#)

Contractor Company [Click here to enter text.](#)

Site/Facility [Click here to enter text.](#)

IMPACT Incident Number (if known) [Click here to enter text.](#)

Please answer the following questions regarding the incident.

1. Did this incident require medical treatment beyond first aid? Yes No
2. Did this incident result in property damage greater than \$5,000? Yes No
3. Was this incident considered a potential serious injury or fatality (SIF, an incident that had the potential for serious personal injury, significant property damage and/or environmental damage)? Yes No

If "No" is answered to ALL of the above three questions, then STOP. Do not complete Question 4.
NO alcohol and drug testing required.

NOTE: If "Yes" is answered to Questions 1, 2 or 3, proceed to Question 4.

4. Did the performance of a contractor directly or indirectly contribute to this incident? Yes No

If "No" is answered to Question 4, then **no alcohol and drug testing required.**

NOTE: If "Yes" is answered to Question 4, a contractor Alcohol and Drug test **IS REQUIRED** by the Company. Contractor(s) contributing to the incident must sign a consent form. Badge(s) must be removed and delivered to Security and Contractor(s) must be escorted out of the facility.

Date badges(s) taken, pending alcohol and drug test results.

Date [Click here to enter text.](#) Temporary Custodian of badge(s) [Click here to enter text.](#)

If badges were not taken, explain why [Click here to enter text.](#)

Originated by Contract Supervisor or equivalent	Reviewed by EMES PM or equivalent
Name (Please Print) Click here to enter text.	Name (Please Print) Click here to enter text.
Signature/Date Click here to enter text.	Signature/Date Click here to enter text.

The SSH&E Supervisor or equivalent personnel of the contractor company is responsible for completing the **Initial Incident Notification Form** (16-point form). The information should be emailed to the EMES Project Manager. The **Initial Incident Notification Form** is only required for corporate reportable incidents.

Use the following guidelines for employees or contractors returning to work:

If the healthcare provider indicates restrictions, supervisor must make sure the healthcare provider is aware of available light duty.

A clear understanding of limitations is obtained before returning the injured or ill person to the workplace to make certain the person is not placed at risk for additional injury or complications.

Contract company medical provider will provide assistance in understanding the extent of injuries and physical limitations relative to work responsibilities.

For ExxonMobil employees only:

ExxonMobil MOH, with input from the healthcare provider as applicable, will provide information regarding appropriate treatment for the injured or ill person.

Initial Incident Notification Form (16-Point Form)

			Notification distributed to:	Click here to enter text.
Business Unit:	Click here to enter text.	Regional Business Unit:	Click here to enter text.	
		Regional SSH&E Contact:	Click here to enter text.	
Country:	Click here to enter text.	Regional Public Affairs Contact:	Click here to enter text.	
1	Date of Incident:	Click here to enter text.	Time of Incident:	Click here to enter text.
2	Location of Incident:	Click here to enter text.		
3	Brief Account of Incident/Type of Incident:	Click here to enter text.		
4	Damage Control Measures Initiated:	Click here to enter text.		
5	Treatment Provided:	Click here to enter text.		
6	Drug and Alcohol testing for cause initiated:	Click here to enter text.		
		Number of Injuries	Number of Fatalities	Click here to enter text.
7a	ExxonMobil:	Number.	Number.	Click here to enter text.
7b	Contractor:	Number.	Number.	Click here to enter text.
7c	Third Party:	Number.	Number.	Click here to enter text.
8	Business impact/damage/loss company facilities:	Click here to enter text.		
9	Business impact/damage/loss contractor facilities:	Click here to enter text.		
10	Business impact/damage/loss third party facilities:	Click here to enter text.		
11	Effect on Company Operations:	Click here to enter text.		
12	External agencies involved/contacted:	Click here to enter text.		
13	Media coverage:	Click here to enter text.		
14	Equipment checks performed:	Click here to enter text.		
15	Affiliate investigation initiated:	Click here to enter text.		
16	Preliminary conclusions regarding the cause of the incident/corrective measures being implemented:	Click here to enter text.		
	Exxon Mobil person in charge of response/investigation:	Click here to enter text.		
	What assistance has been requested:	Click here to enter text.		
	Additional comments:	Click here to enter text.		
	Date:	Click here to enter text.	Time:	Click here to enter text.
	Prepared by:	Click here to enter text.	Reviewed by:	Click here to enter text.
	Contact number for Notifier:	Click here to enter text.		

Work Limitations/Return to Work Form

Name [Click here to enter text.](#)

Company [Click here to enter text.](#)

Location [Click here to enter text.](#)

Work Phone [Click here to enter text.](#)

Cell Phone [Click here to enter text.](#)

Supervisor [Click here to enter text.](#)

Today's Date [Click here to enter text.](#)

Return to Work (Note: If checked skip to signature line.)

The limitations checked below are: Permanent Temporary

Bending

Exposure to Temperature
Extremes

Prolonged Walking or
Standing

Climbing Stairs

Kneeling/Crawling

Shift Work

Climbing
Structures/Ladders

Lift/Push/Pull/Carry
over [Click to enter text](#)

Use of: [Click to enter text](#)

Drive/Operate Heavy
Equipment

Overhead Work

Work above Ground Level

Driving Company Vehicle

Overtime

Work around Moving
Machinery

Work Alone

Other: [Click here to enter text.](#)

(Please, do not include any medical information)

COMMENTS:

[Click here to enter text.](#)

Name of contract

company supervisor: [Click here to enter text.](#)

Signature [Click here to enter text.](#)

Date

[Click here to enter
text.](#)

Name of ExxonMobil

contact supervisor: [Click here to enter text.](#)

Signature [Click here to enter text.](#)

Date

[Click here to enter
text.](#)

CRITICAL or

LIFE THREATENING EMERGENCY

1. **STOP WORK!** Assess scene for hazards to self and others. Make sure the scene is safe.
2. Provide immediate medical care to injured / ill worker.
 - a. Administer first aid.
 - b. Call 911.
3. Secure the incident scene for investigation.
4. Assign a worker to direct Emergency Medical Services (EMS) onto jobsite > evaluate if worker can be safely relocated or should remain at site.
5. Call management in the following order until you speak with a manager:
 - a. Ryan Pozzuto (cell) (206) 550-6681
 - b. James Anderson (cell) (805) 701-1420
 - c. Jim Chappell (cell) (707) 338-6991
 - d. Sean Guiltinan (cell) (949) 468-9542
 - e. Gretchen Thach (cell) (508) 579-7522
 - f. Peter Petro (cell) (707) 338-3386
 - g. Land Line (night work) (800) 499-8950
6. Assist EMS personnel as needed.
7. If worker is transported, ask EMS for destination. The senior person onsite should follow EMS to the medical facility.
8. Take Employee Medical Treatment form to medical facility
9. Complete Medical Treatment form (Appendix J).
10. Provide medical facility with completed form.
11. Ask doctor for full duty release, OTC treatment options, or, at minimum, a restricted duty release.

Senior Management will address active care management for IP & client notification.

ALL INJURIES or ILLNESS

EXCEPT LIFE THREATENING

1. **STOP WORK!** Assess scene for hazards and make sure the scene is safe.
2. Provide immediate first aid to injured / ill worker (IP).
3. Secure the incident scene for investigation.
4. Review Care Management appendix / Incident Go Book in HASP.
5. Call management in the following order until you **SPEAK** with a manager, and ask whom will be primary to provide support:
 - a. Ryan Pozzuto (cell) (206) 550-6681
 - b. James Anderson (cell) (805) 701-1420
 - c. Jim Chappell (cell) (707) 338-6991
 - d. Sean Guiltinan (cell) (949) 468-9542
 - e. Gretchen Thach (cell) (508) 579-7522
 - f. Peter Petro (cell) (707) 338-3386
 - g. Land Line (night work) (800) 499-8950
6. Participate with IP and manager in call to WorkCare at (888) 449-7787. A nurse will provide information, options, and guidance.
7. If additional treatment is directed, senior person onsite must transport worker to occupational health clinic.
8. Ask doctor for OTC treatment options, full duty release or, at minimum, a restricted duty release.

Senior Management will address active care management for IP & client notification.

APPENDIX M

Shoring Plans and Geotechnical Report



GENERAL SHORING NOTES

ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC), 2021 EDITION, AS AMENDED BY THE CITY OF EVERETT. REFER TO THE FOLLOWING DOCUMENTS:
 1. GEOTECHNICAL REPORT BY STANTEC, DATED JUNE 6, 2023.

DESIGN LOADS:
 THE SOIL PRESSURES RECOMMENDED IN THE GEOTECHNICAL REPORT WERE USED FOR DESIGN. SUBMITTALS:
 SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO ANY FABRICATION OR CONSTRUCTION FOR ALL STRUCTURAL ITEMS.

INSPECTION:
 SPECIAL INSPECTION PER IBC CHAPTER 17 BY A QUALIFIED GEOTECHNICAL ENGINEER OR INDEPENDENT TESTING LAB WILL BE PROVIDED BY THE OWNER AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTIONS AND TESTING FOR EXCAVATION SHORING.

SPECIAL CONDITIONS:
 CONTRACTOR SHALL VERIFY ALL LEVELS, DIMENSIONS, AND EXISTING CONDITIONS IN THE FIELD BEFORE PROCEEDING. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR CONFLICTS IMMEDIATELY. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES IN THE EXISTING CONDITIONS AND THE DRAWINGS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER BEFORE PROCEEDING. DIMENSIONS NOTED AS PLUS OR MINUS (+) INDICATE UNVERIFIED DIMENSIONS AND ARE APPROXIMATE. NOTIFY ENGINEER IMMEDIATELY OF CONFLICTS OR EXCESSIVE VARIATIONS FROM INDICATED DIMENSIONS. NOTED DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS—DO NOT SCALE DRAWINGS. DIMENSIONS OF EXISTING CONDITIONS ARE TO BE FIELD-VERIFIED BY THE CONTRACTOR.

UTILITY LOCATION:
 UTILIZE THE SERVICES OF THE "UTILITY LOCATOR SERVICE" (1-800-424-5555) TO VERIFY THE EXTENT AND LOCATIONS AND ALIGNMENTS OF SITE UTILITIES. IF THE ACTUAL FIELD VERIFIED CONDITIONS OF UTILITIES COULD RESULT IN A CONFLICT WITH THE SHORING, NOTIFY THE ENGINEER IMMEDIATELY. DO NOT DAMAGE EXISTING UTILITIES.

PRIOR TO CONSTRUCTION, VERIFY THAT OVERHEAD OBSTRUCTIONS, INCLUDING ELECTRICAL LINES, DO NOT INTERFERE WITH THE CONTRACTOR'S DRILLING EQUIPMENT.

STRUCTURAL STEEL

- REFERENCE SPECIFICATIONS:
 STRUCTURAL STEEL
- HIGH STRENGTH BOLTS
 AISC 360 - SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS
- WELDING
 AWS D1.1 TYPICAL
 AWS D1.3 FOR STEEL DECK AND COLD-FORMED FRAMING
 AWS D1.8 FOR SUPPLEMENTAL SEISMIC PROVISIONS
 AWS PREQUALIFIED JOINT DETAILS
- WELDER CERTIFICATION
 AMERICAN WELDING SOCIETY (AWS)
 WASHINGTON ASSOCIATION OF BUILDING OFFICIALS (WABO)

- STEEL MATERIALS
 WIDE FLANGE SHAPES (W AND WT)
 PLATES (PL), BARS
 ANGLES (L), CHANNELS (C AND MC)
 STRUCTURAL TUBES (HSS)
 STEEL PIPE
 STRUCTURAL BOLTS
 ANCHOR RODS
 THREADED RODS
 WELDING ELECTRODES

STRUCTURAL STEEL DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO THE REQUIREMENTS OF IBC CHAPTER 22. SUBSTITUTION OF MEMBER SIZES OR STEEL GRADE WILL NOT BE ALLOWED WITHOUT PRIOR APPROVAL BY THE ENGINEER.

WELDING:
 ALL WELDING SHALL BE IN CONFORMANCE WITH AISC AND AWS STANDARDS, AND SHALL BE PERFORMED BY WABO-CERTIFIED WELDERS.

SHEET PILE REQUIREMENTS

RECORDS:
 THE CONTRACTOR MUST KEEP RECORDS OF THE INFORMATION LISTED BELOW FOR EACH OF THE ELEMENTS IN THE SHEET PILE WALL. TWO SIGNED COPIES OF THE RECORD MUST BE SUBMITTED TO THE ENGINEER OF THE FIRST WORKING DAY FOLLOWING THE INSTALLATION OF THE ELEMENTS.

- FILE TYPE AND GRADE OF STEEL
- PILE LENGTH
- DATE OF DRIVING METHOD
- COMMENCING SURFACE LEVEL
- DEPTH DRIVEN
- LENGTH OF PILE CUT OFF
- LENGTH OF PILE EXTENSIONS
- THE MEASUREMENT OF DRIVING RESISTANCE AT APPROPRIATE DEPTHS
- ALL INFORMATION REGARDING UNEXPECTED EVENTS WHILE DRIVING

SHEET PILES
 ALL SHEET PILES SHALL BE MANUFACTURED BY SKYLINE STEEL (NUCOR COMPANY), 40 FEELS OR AN APPROVED EQUIVALENT.
 STEEL GRADE: A2
 HOT ROLLED STEEL
 ASTM A572 GRADE 50

SECTION	H INCH	AREA IN ² /F	SECTION MODULUS IN ³ /F	MOMENT OF INERTIA IN ⁴ /F
A2/A	16.56	6.88	36.10	270.80
A2/A	18.07	10.20	63.80	576.30

SUBSTITUTION OF A DIFFERENT SIZE, SPECIFICATION, OR GRADE OF STEEL REQUIRES THE ENGINEER'S APPROVAL.

FABRICATED SHEET PILES
 ALL FABRICATED SHEET PILES SHALL BE FABRICATED AND SUPPLIED ACCORDING TO THE RECOMMENDATIONS OF SHEET PILE MANUFACTURER.

PILE HANDLING
 ALL STORAGE, HANDLING AND TRANSPORTATION OF PILES MUST BE CARRIED OUT IN SUCH A WAY THAT NO SIGNIFICANT DAMAGE OCCURS TO THE PILES OR ANY SURFACE TREATMENT ON THE PILES.

PILE INSTALLATION
 THE CONTRACTOR MUST BE SATISFIED THAT THE SHEET PILES CAN BE INSTALLED ADEQUATELY TO THE CORRECT DEPTHS THROUGH THE REPORTED OR ANTICIPATED SOIL CONDITIONS. THE ENGINEER MUST BE NOTIFIED 24 HOURS BEFORE PILE INSTALLATION BEGINS.

SHORING PROCEDURE

VERIFICATION
 VERIFICATION OF DIMENSIONS AND LOCATIONS OF EXISTING STRUCTURES PRIOR TO FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBER. NOTIFY THE ENGINEER ABOUT ANY DISCREPANCIES IN DIMENSIONS.

SHORING REMOVAL
 REMOVE ALL COMPONENTS OF SHORING WALLS TO A DEPTH OF AT LEAST 4 FEET BELOW FINISHED GRADE FOLLOWING CONSTRUCTION. REMOVE ALL COMPONENTS OF SHORING IF DIRECTED BY THE PORT OF EVERETT.

SHORING NOTES

SHORING MONITORING

RECONSTRUCTION SURVEY
 PRIOR TO CONSTRUCTION, COMPLETE A WRITTEN AND PHOTOGRAPHIC LOG OF EXISTING CONDITIONS OF THE ADJOINING CONSTRUCTION AND SITE IMPROVEMENTS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY THE ABSENCE OF, THE INSTALLATION OF, OR THE PERFORMANCE OF EXCAVATION SUPPORT AND PROTECTION SYSTEMS. A LICENSED SURVEYOR SHALL DOCUMENT ALL EXISTING SUBSTANTIAL CRACKS IN ADJACENT STREETS, SIDEWALKS, AND EXISTING STRUCTURES. CRACK GAUGES MAY BE REQUIRED BY THE ENGINEER.

OPTICAL SURVEY
 SURVEY THE VERTICAL AND HORIZONTAL DISPLACEMENT AT THE TOP SHEET PILES AT 20'-0" INTERVALS.

ESTABLISH SURVEY LINES NEAR THE TOP OF THE WALL AND AT DISTANCES UP TO THE WALL HEIGHT, H, BEHIND THE WALL FACE. SPACE THESE POINTS A MAXIMUM OF 50 FEET APART.

ESTABLISH A BASELINE READING OF THE MONITORING POINTS ON THE SHORING SURFACE BEHIND THE SHORING WALLS BEFORE INSTALLING THE SHORING. PRIOR TO BEGINNING EXCAVATION.

THE GEOTECHNICAL ENGINEER SHALL REVIEW SURVEY DATA AND PROVIDE AN EVALUATION OF WALL PERFORMANCE ALONG WITH SURVEY DATA TO THE AUTHORITY HAVING JURISDICTION (AHJ) AND THE SHORING ENGINEER ON AT LEAST A WEEKLY BASIS. IMMEDIATELY AND DIRECTLY NOTIFY THE AHJ AND THE SHORING ENGINEER IF ANY UNUSUAL OR SIGNIFICANTLY INCREASED MOVEMENT OCCURS.

SHORING MONITORING

MONITORING OF THE SURVEY POINTS SHALL INCLUDE VERTICAL AND HORIZONTAL READINGS ACCURATE TO AT LEAST 0.01 FEET. THE FREQUENCY OF THE MEASUREMENTS IS DEPENDENT ON THE CONSTRUCTION STAGE, AS NOTED BELOW:

CONSTRUCTION STAGE	MONITORING FREQUENCY
DURING EXCAVATION AND UNTIL WALL MOVEMENTS HAVE STABILIZED.	TWICE WEEKLY
DURING EXCAVATION IF LATERAL WALL MOVEMENTS EXCEED 1 INCH, OR AT THE DISCRETION OF THE ENGINEER.	DAILY AT MINIMUM
AFTER EXCAVATION IS COMPLETE AND WALL MOVEMENTS HAVE STABILIZED, IF THE AHJ INDICATES LITTLE OR NO MOVEMENT.	TWICE MONTHLY

SUBMIT SURVEY DATA TO THE GEOTECHNICAL ENGINEER, SHORING ENGINEER, AND THE AHJ EACH WEEK. NOTIFY THE AHJ AND THE SHORING ENGINEER IMMEDIATELY IF ANY UNUSUAL OR SIGNIFICANTLY INCREASED MOVEMENTS OCCUR.

SURVEYING MUST CONTINUE UNTIL THE BACKFILL IS COMPLETE UP TO FINAL ADJACENT GRADES. TERMINATION OF SURVEY MONITORING WILL BE DETERMINED BY THE GEOTECHNICAL ENGINEER AFTER REVIEW AND APPROVAL BY THE AHJ.

SHORING WALL DEFLECTION LIMITS AND MITIGATION MEASURES

IF LATERAL MOVEMENTS OF THE SHORING WALL ARE OBSERVED TO EXCEED 2 INCH STOP CONSTRUCTION OF THE SHORING WALL IN THE VICINITY OF THE AFFECTED PORTION OF THE SHORING WALL. IMMEDIATELY AND DIRECTLY NOTIFY THE GEOTECHNICAL AND SHORING ENGINEERS. WHEN TOTAL LATERAL MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS AND WHEN TOTAL LATERAL MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS, THE CAUSE OF THE MOVEMENT AND GEOTECHNICAL ENGINEER SHALL DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES SUFFICIENT TO LIMIT TOTAL WALL MOVEMENTS TO 3 INCH. THESE MEASURES MAY CONSIST OF INTERNAL BRACING (I.E. WALES AND RAKERS), ADDITIONAL TIEBACKS AND/OR SOIL BERMING. IMPLEMENTATION OF THE MITIGATION MEASURES WILL BE CONSIDERED AT THAT TIME.

THE FREQUENCY OF THE SHORING SURVEY MONITORING PROGRAM WILL BE ALTERED PERIODICALLY. THE FREQUENCY OF SURVEY MONITORING SHALL BE INCREASED TO ONCE PER DAY UNTIL DIRECTED OTHERWISE BY THE GEOTECHNICAL ENGINEER.

DRAWING SCHEDULE

- S-01 SHORING NOTES AND DRAWING SCHEDULE
- S-02 SHORING ABBREVIATIONS AND SYMBOLS
- S-03 SHORING SITE PLAN
- S-04 SHORING ELEVATIONS AND SECTIONS
- S-05 SHORING ELEVATIONS AND SECTIONS
- S-06 SHORING ELEVATIONS AND SECTIONS
- S-07 SHORING DETAILS

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

DRAWN: RAJ	PROJECT NO: 2300263
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJC	DATE: 01-12-2024
DRAWING NO.	S-01
SHEET NO.	OF

PORT OF EVERETT SHORING
 EVERETT, WA

SHORING NOTES AND DRAWING SCHEDULE

NO.	DATE	BY	REVISION



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 Seattle, WA 98101
 206.632.9282
 www.kpff.com

SHORING NOTES

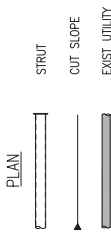
DESIGN PRESSURES

1. ALL DESIGN PRESSURES ARE PER THE GEOTECHNICAL ENGINEER.
2. ALL UNITS IN FEET AND POUNDS.
3. DESIGN DOES NOT INCLUDE HYDROSTATIC PRESSURE ABOVE THE GROUNDWATER TABLE.
4. WATER TABLE INSIDE THE EXCAVATION IS WITHIN 2' OF WATER TABLE OUTSIDE THE EXCAVATION. NO DEWATERING IS PERFORMED INSIDE THE EXCAVATION.

SHORING ABBREVIATIONS

ARCH	KSJ	KIPS PER SQ. IN.
B/	LB	POUND
BLDG	LLH	LONG LEG HORIZONTAL
CDP	LLV	LONG LEG VERTICAL
CL	MAX	MAXIMUM
CLR	MIN	MINIMUM
COL	NS	NEAR SIDE, NONSHRINK
CONC	OC	ON CENTER
CP	OD	OUTSIDE DIAMETER
DIA	OF	OUTSIDE FACE
EL	PL	PLATE, PROPERTY LINE
EO	PP	PARTIAL PENETRATION
EXC	PSF	POUNDS PER SQ. FT.
EXIST	PSI	POUNDS PER SQ. IN.
FDN	R	RADIUS
FT	RIGHT-OF-WAY	RIGHT-OF-WAY
FTG	SHT	SHEET
GS	SOG	SLAB-ON-GRADE
IN	STRUCT	STRUCTURAL
K	T/	TOP OF
KSF	TYP	TYPICAL

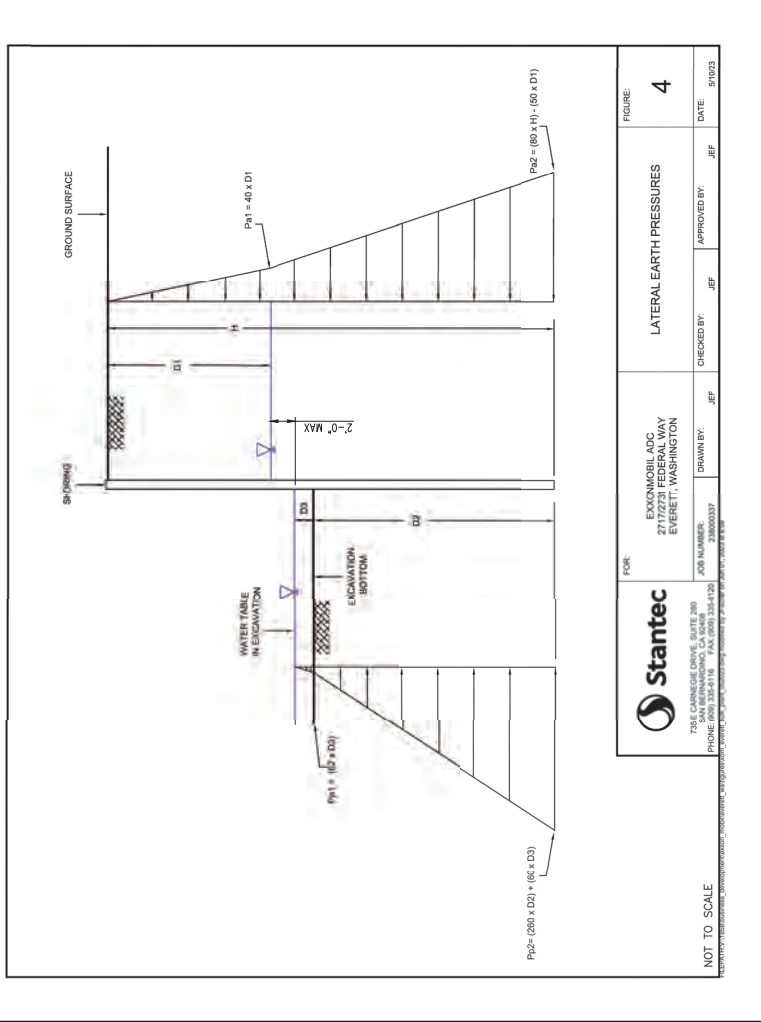
SHORING SYMBOLS



SHORING SPECIAL INSPECTIONS AND TESTING SCHEDULE

ESTABLISHED PER IBC 2021 SECTION 110 AND CHAPTER 17	ITEM	IBC CODE	COMMENTS
	SHEET PILES	1705.8	BY GEOTECHNICAL ENGINEER
	STRUCTURAL STEEL	1705.2	
	WELDING		

SHORING SPECIAL INSPECTIONS AND TESTING NOTES:
 1. INSPECTION REQUIREMENTS FOR SYSTEMS DESIGNED BY OTHERS SHALL BE DEFINED BY THE REGISTERED DESIGN PROFESSIONAL RESPONSIBLE FOR THEIR DESIGN. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY TO ALL BIDDER-DESIGNED COMPONENTS.



Stantec
 1500 1st Avenue, Suite 1900
 San Ramon, CA 94583
 PHONE (925) 335-8118 FAX (925) 335-4100
 www.stantec.com

FOR: EXXONMOBIL ADC
 2700 1ST AVENUE
 EVERETT, WASHINGTON

JOB NUMBER: 23000363
 DRAWN BY: JEF
 CHECKED BY: JEF
 APPROVED BY: JEF
 DATE: 5/10/23

NOT TO SCALE

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJE	DATE: 01-12-2024
DRAWING NO.	S-02
SHEET NO.	OF

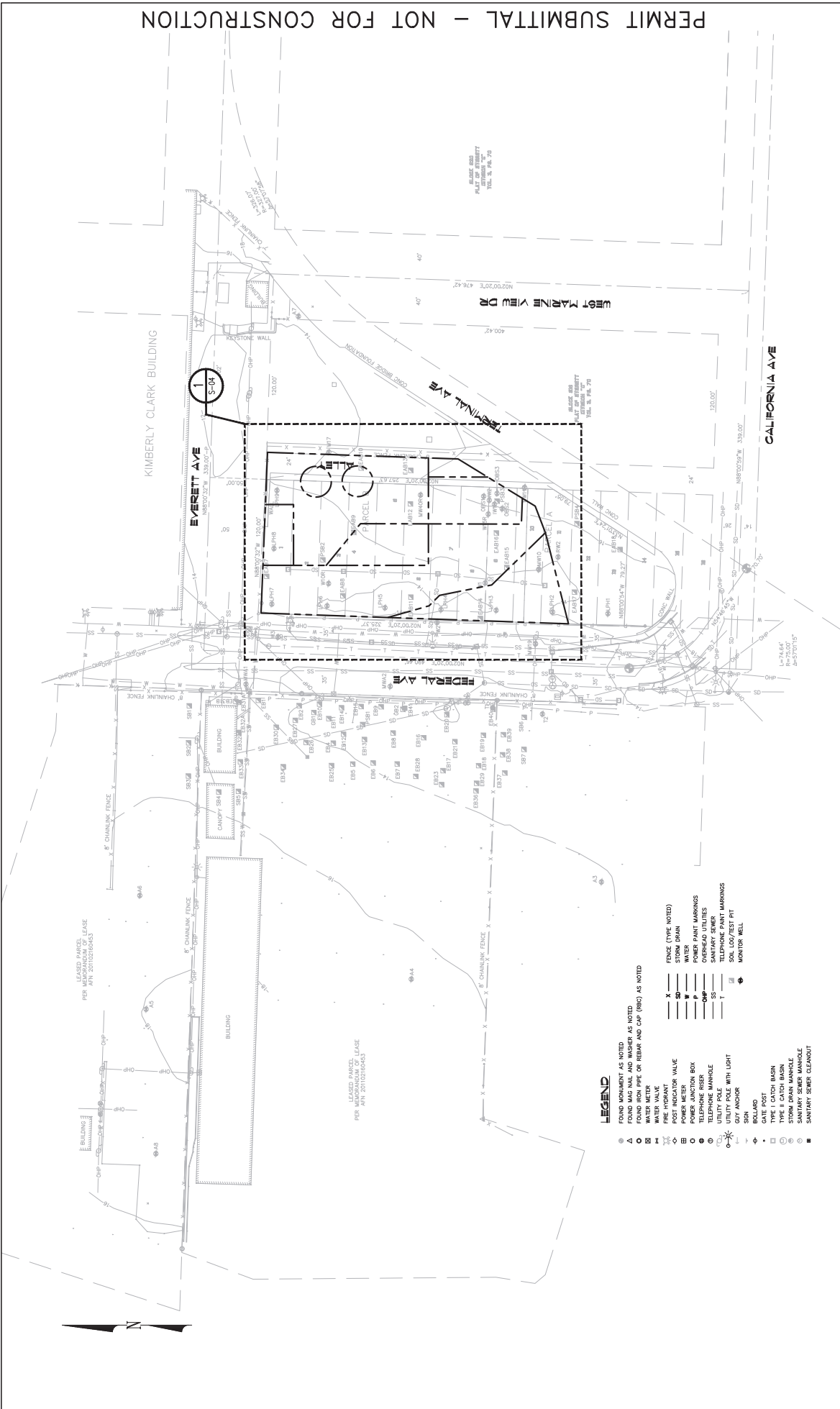
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 EVERETT, WA

SHORING ABBREVIATIONS, AND SYMBOLS

NO.	DATE	BY	REVISION



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- LEGEND**
- ▲ FOUND MANHOLE AS NOTED
 - △ FOUND MANHOLE AS NOTED
 - FOUND IRON PIPE OR REBAR AND CAP (RIBC) AS NOTED
 - ⊗ WATER METER
 - ⊕ WATER VALVE
 - ⊖ POST INDICATOR VALVE
 - ⊙ POWER JUNCTION BOX
 - ⊕ OVERHEAD UTILITIES
 - ⊖ TELEPHONE MANHOLE
 - ⊙ TELEPHONE PANT MARKINGS
 - ⊕ SOIL LOG/TEST PIT
 - ⊖ GUY ANCHOR
 - ⊙ BOLLARD
 - ⊕ GATE POST
 - ⊙ TYPE I CATCH BASIN
 - ⊕ TYPE II CATCH BASIN
 - ⊙ STORM DRAIN MANHOLE
 - ⊕ SANITARY SEWER MANHOLE
 - ⊙ SANITARY SEWER CLEANOUT
- FENCE (TYPE NOTED)**
- X CHAINLINK FENCE
 - CONCRETE WALL
 - WOOD FENCE
 - POWER PAINT MARKINGS
 - OVERHEAD UTILITIES
 - TELEPHONE PANT MARKINGS
 - SOIL LOG/TEST PIT
 - MONITOR WELL

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJC	DATE: 01-12-2024
DRAWING NO.	S-03
SHEET NO.	OF

PORT OF EVERETT SHORING
EVERETT, WA

SHORING SITE PLAN

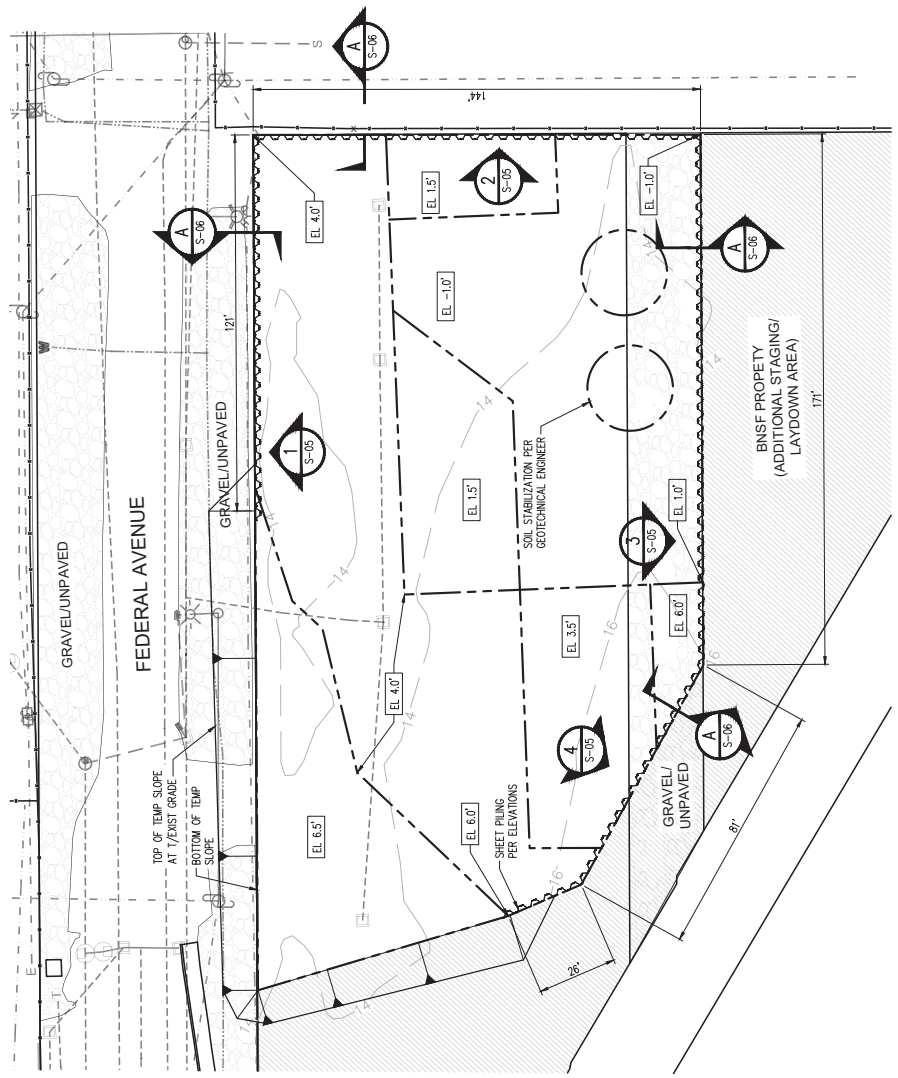
NO.	DATE	BY	REVISION



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Seattle, WA 98101
206.623.3822
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NOTES:

- EXCAVATION EXTENTS PER THE EXTENTS SHOWN IN THE RFP. DO NOT EXTEND THE EXCAVATION BEYOND THE DEPTHS AND HORIZONTAL EXTENTS SHOWN ON THE SHORING DRAWINGS WITHOUT THE ENGINEER'S APPROVAL.
- VERTICAL DATUM IS NAVD88
- DIMENSIONS OF UTILITY STRUCTURES ARE FOR REFERENCE ONLY. COORDINATE ALL WORK WITH CIVIL DRAWINGS.
- THE UTILITIES SHOWN ARE BASED ON FIELD SURVEYS, AERIAL PHOTOGRAPHY, AND RECORD DOCUMENTS. OTHER UTILITIES MAY EXIST THAT WERE NOT DISCOVERED THROUGH THE RECORD CHECK. UTILITY ALIGNMENTS MAY BE DIFFERENT THAN THOSE SHOWN. THE CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES THROUGH THE APPROPRIATE UTILITY COMPANIES AND BY CALLING THE "UTILITY LOCATOR SERVICE".
- SHEET PILES ARE ASSUMED TO BE INSTALLED FROM EXISTING GRADE (±).
- EL. 4.07 INDICATES BOTTOM OF EXCAVATION. SLOPE BOTTOM OF EXCAVATION EVENLY BETWEEN ELEVATIONS SHOWN AND PER SHORING ELEVATIONS.
- EXISTING GRADE (±). TOPS OF SHEET PILES SHALL BE 6" MIN ABOVE EXISTING GRADE.
- CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXCAVATION AND CONSTRUCTION SEQUENCING.
- WATER TABLE INSIDE OF EXCAVATION SHALL NOT FALL BELOW 2' WATER TABLE OUTSIDE OF EXCAVATION.



SHORING ENLARGED PLAN
SCALE: 1" = 20'

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJC	DATE: 01-12-2024
DRAWING NO.	S-04
SHEET NO.	OF

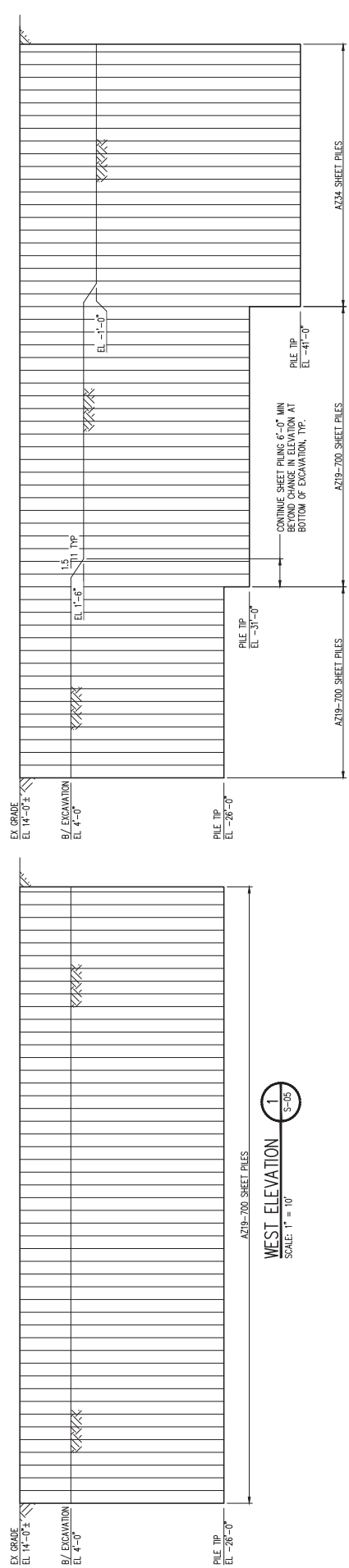
PORT OF EVERETT SHORING
EVERETT, WA

SHORING ENLARGED PLAN

NO.	DATE	BY	REVISION

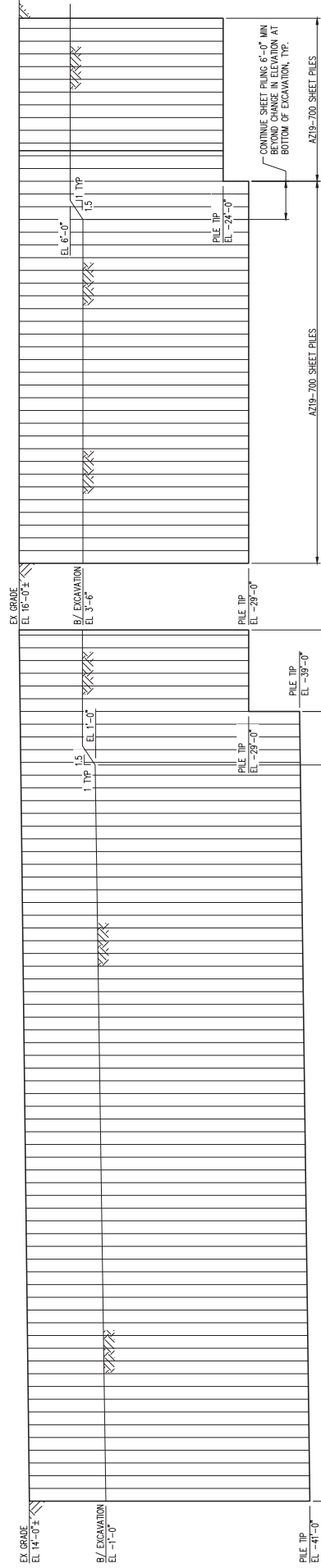


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WEST ELEVATION 1
SCALE: 1" = 10'
S-05

NORTH ELEVATION 2
SCALE: 1" = 10'
S-05



EAST ELEVATION 3
SCALE: 1" = 10'
S-05

SOUTHWEST ELEVATION 4
SCALE: 1" = 10'
S-05



1601 5th Avenue, Suite 1600
Seattle, WA 98101
206.623.3822
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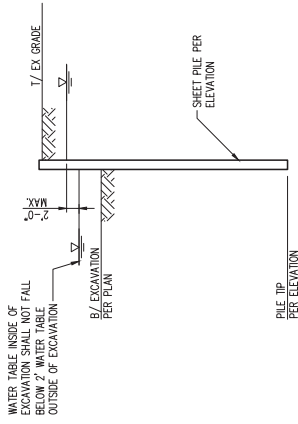


NO.	DATE	BY	REVISION

PORT OF EVERETT SHORING
EVERETT, WA

SHORING ELEVATIONS

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJC	DATE: 01-12-2024
DRAWING NO.	S-05
SHEET NO.	OF



TYPICAL SHEET PILE SECTION **A**
SCALE: 1" = 10'

PERMIT SUBMITTAL - NOT FOR CONSTRUCTION

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJC	DATE: 01-12-2024
DRAWING NO.	S-06
SHEET NO.	OF

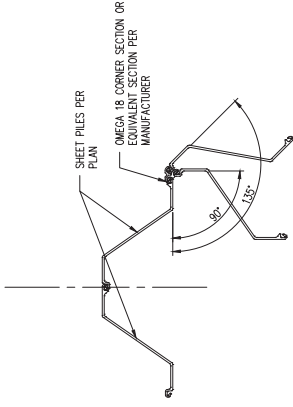
PORT OF EVERETT SHORING
EVERETT, WA

SHORING ELEVATIONS AND SECTIONS

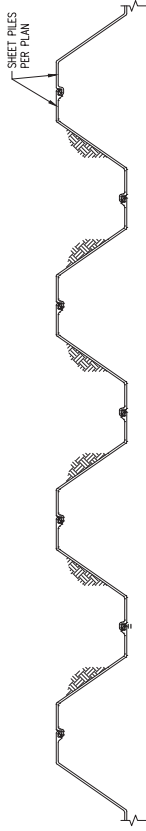
NO.	DATE	BY	REVISION



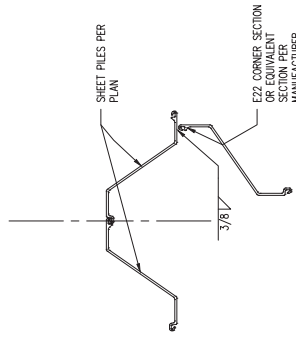
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TYPICAL 90° OR 135° CORNER
SCALE: 3/4" = 1'-0"
2
S-106



TYPICAL SHEET PILE LAYOUT
SCALE: 3/4" = 1'-0"
1
S-106



TYPICAL ECCENTRIC 90° CORNER
SCALE: 3/4" = 1'-0"
3
S-106

DRAWN: RAJ	PROJECT NO: 2300363
DESIGN: SJA	SCALE: AS SHOWN
CHECKED: BJE	DATE: 01-12-2024
DRAWING NO.	S-07
SHEET NO.	OF

PORT OF EVERETT SHORING
EVERETT, WA

SHORING DETAILS

NO.	DATE	BY	REVISION



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Seattle, WA 98101
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Port of Everett Shoring Support

Everett, WA

Updated Structural Calculations

CALCULATIONS INCLUDED:

These Calculations cover this scope:

Calculations necessary for the design of the sheet pile wall system to shore the soil outside the project site while the soil within the site is excavated and replaced. Calculations contain loading on the shoring wall which is based on the recommendations of the Geotechnical report by Stantec. Calculations for internal forces and design of the sheet pile wall itself are performed using the software program, "Shoring8" by Civiltech Software.

Design of the shoring wall has been divided into three separate design conditions, a 10 ft cantilever condition, a 12.5 ft cantilever condition, and a 15 ft cantilever condition. These conditions are used at the shoring walls as necessary. An added 2 ft of soil depth is added to the loading calculations for each design condition to account for surcharge loading at the top of the shoring wall, even though use of heavy machinery at these locations is not anticipated. Where the excavated depth is less than 10 feet, the soil will be cut back at a slope outside the excavated area instead of using a sheet pile wall to retain the soil.

Per a contractor VE suggestion, no dewatering will occur within the excavation. Shoring walls have been designed assuming that the water table inside the excavation is no less than two feet below the water table outside the excavation. Varying water table depths between the top of the excavation and the bottom of the excavation have been considered in the design.



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Seattle, WA 98101 206.622.5822

KPFF Project No. 10042300363

January 12, 2024



10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 10' deep excavation, No dewatering and water table at 0' BGS

H (ft)	50
D1 (ft)	0
D2 (ft)	40
D3 (ft)	8
H-D2 Excavation Depth (ft)	10

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

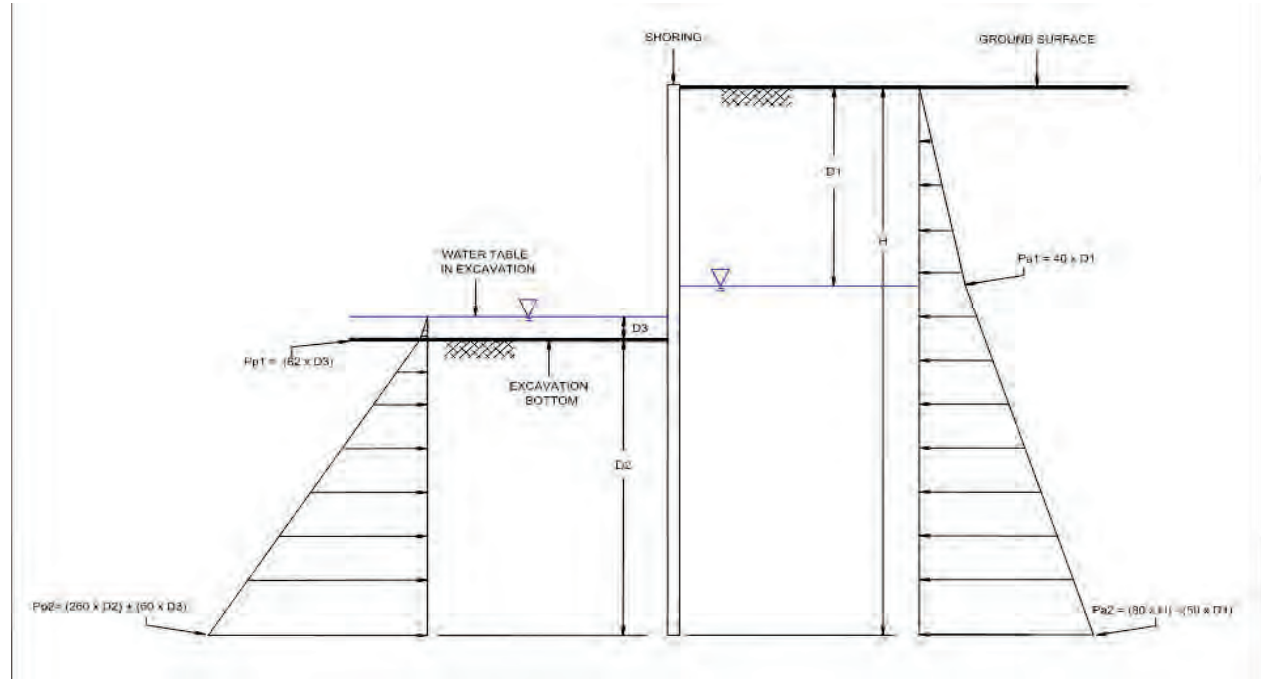
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	0	0.000
Bottom of Excavation	10	0.800
Bottom of Sheet Piling	50	4.000

Surcharge

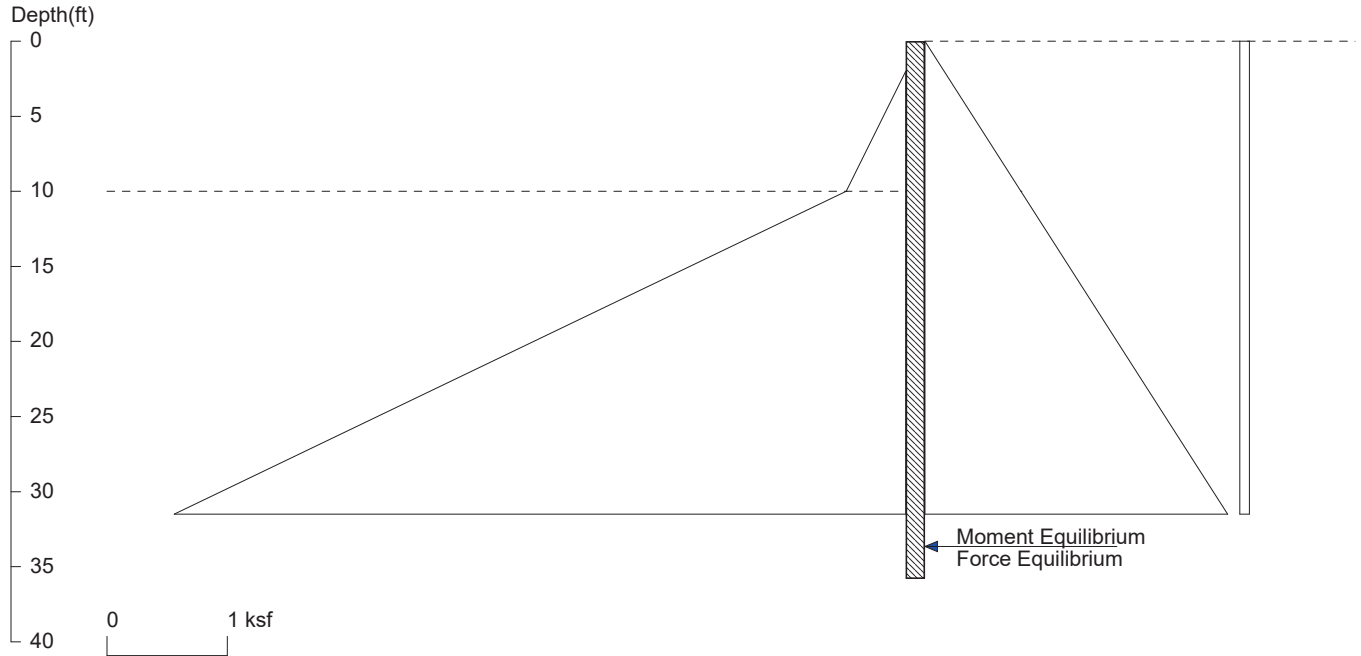
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	10	0.496
Water Table	2	0.000
Bottom of Sheet Piling	50	10.896



10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\10 ft sheet pile wall 0 ft BGS Water.sh8

Wall Height=10.0

Pile Diameter=1.0

Pile Spacing=1.0

Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=25.81 Min. Pile Length=35.81

MOMENT IN PILE: Max. Moment=54.07 per Pile Spacing=1.0 at Depth=22.64

PILE SELECTION:

Request Min. Section Modulus = 27.3 in³/ft=1468.21 cm³/m, F_y= 36 ksi = 248 MPa, F_b/F_y=0.66

AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!

Top Deflection = 1.00(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	10	.8	0.080000
10	.8	50	4	0.080000
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
2	0	10	.496	0.0620
10	.496	50	10.896	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	10.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 10' deep excavation, No dewatering and water table at 5' BGS

H (ft)	50
D1 (ft)	5
D2 (ft)	40
D3 (ft)	3
H-D2 Excavation Depth (ft)	10

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

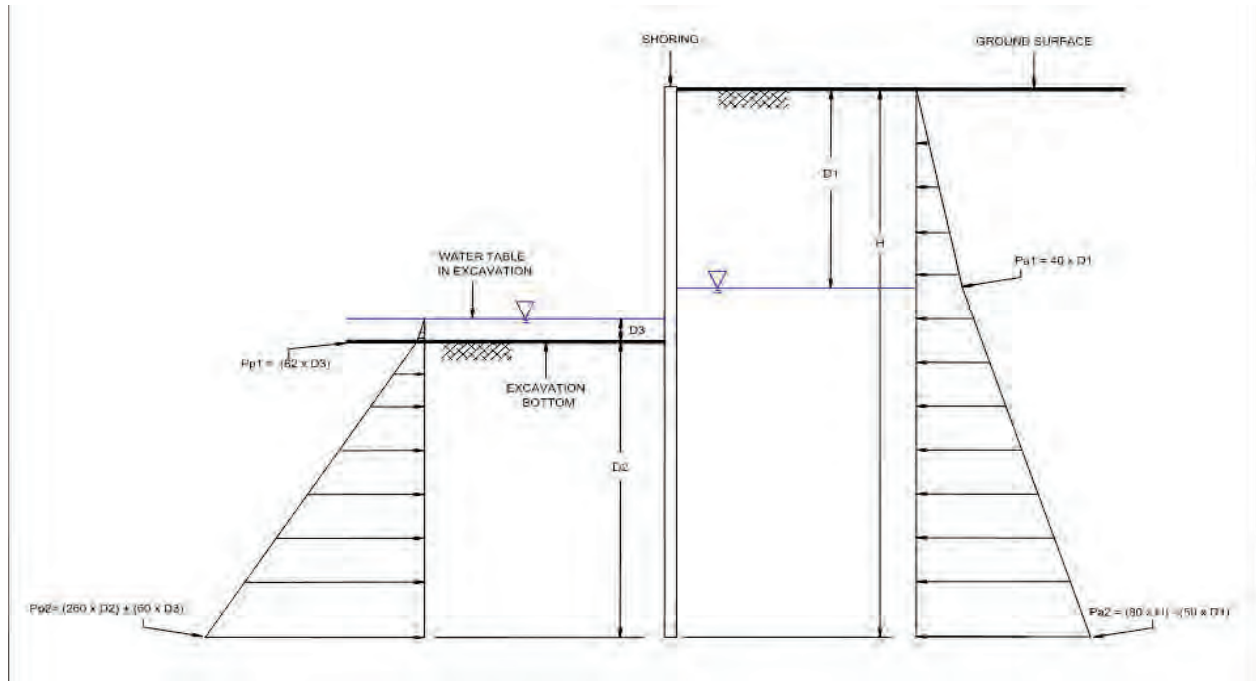
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	5	0.200
Bottom of Excavation	10	0.594
Bottom of Sheet Piling	50	3.750

Surcharge

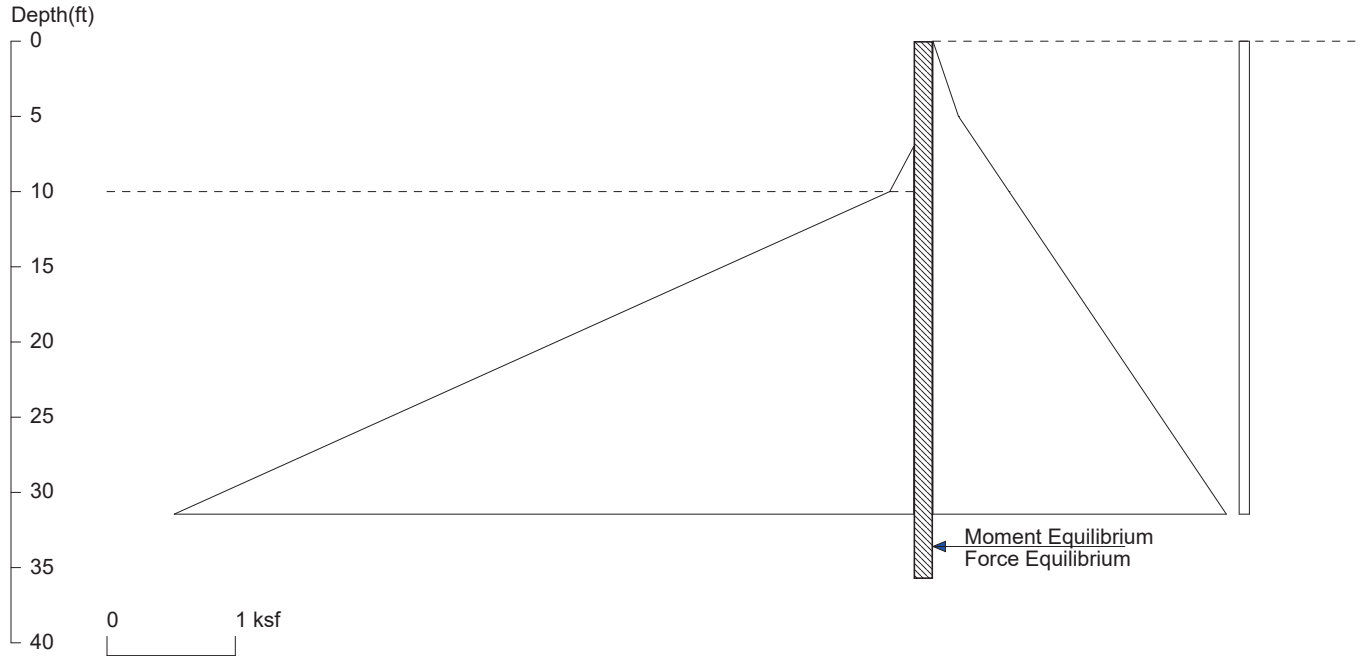
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	7	0.000
Water Table	10	0.186
Bottom of Sheet Piling	50	10.586



10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\10 ft sheet pile wall 5 ft BGS Water.sh8

Wall Height=10.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=25.75 Min. Pile Length=35.75
 MOMENT IN PILE: Max. Moment=51.73 per Pile Spacing=1.0 at Depth=22.75

PILE SELECTION:

Request Min. Section Modulus = 26.1 in³/ft=1404.51 cm³/m, F_y= 36 ksi = 248 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 0.97(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	5	.2	0.040000
5	.2	10	.594	0.078800
10	.594	50	3.75	0.078900
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
7	0	10	.186	0.0620
10	.186	50	10.586	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	10.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 10' deep excavation, No dewatering and water table at 10' BGS

H (ft)	50
D1 (ft)	10
D2 (ft)	40
D3 (ft)	0
H-D2 Excavation Depth (ft)	10

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

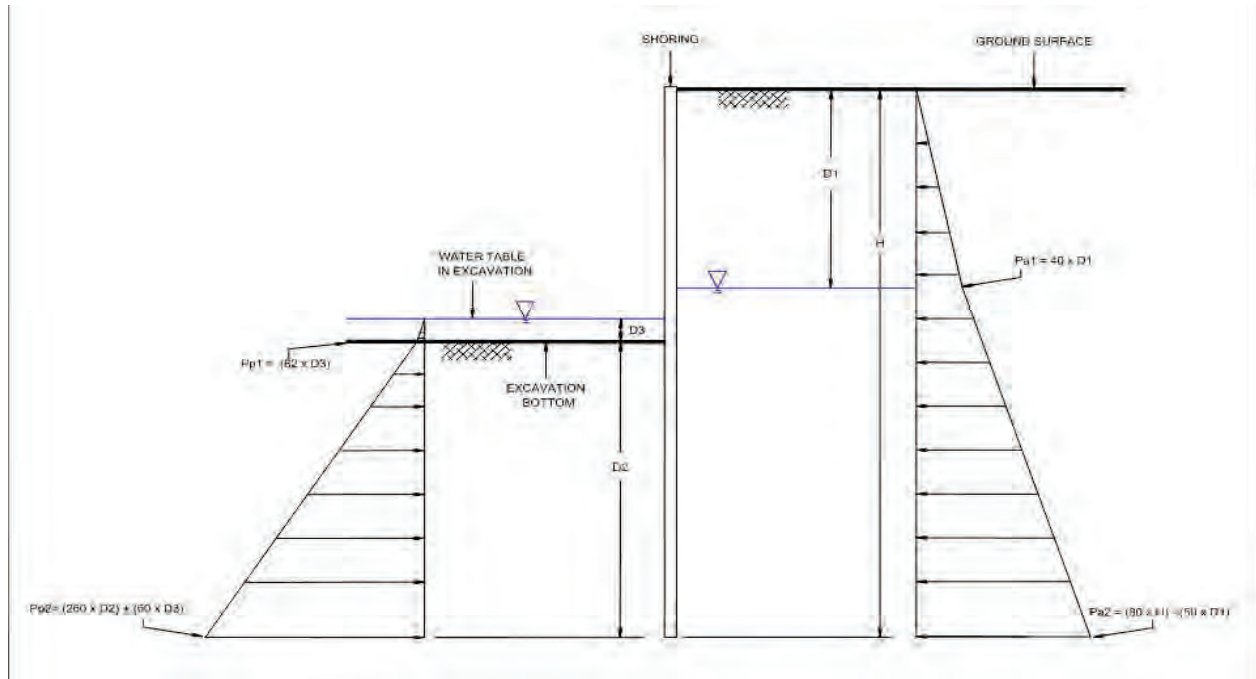
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	10	0.400
Bottom of Excavation	10	0.400
Bottom of Sheet Piling	50	3.500

Surcharge

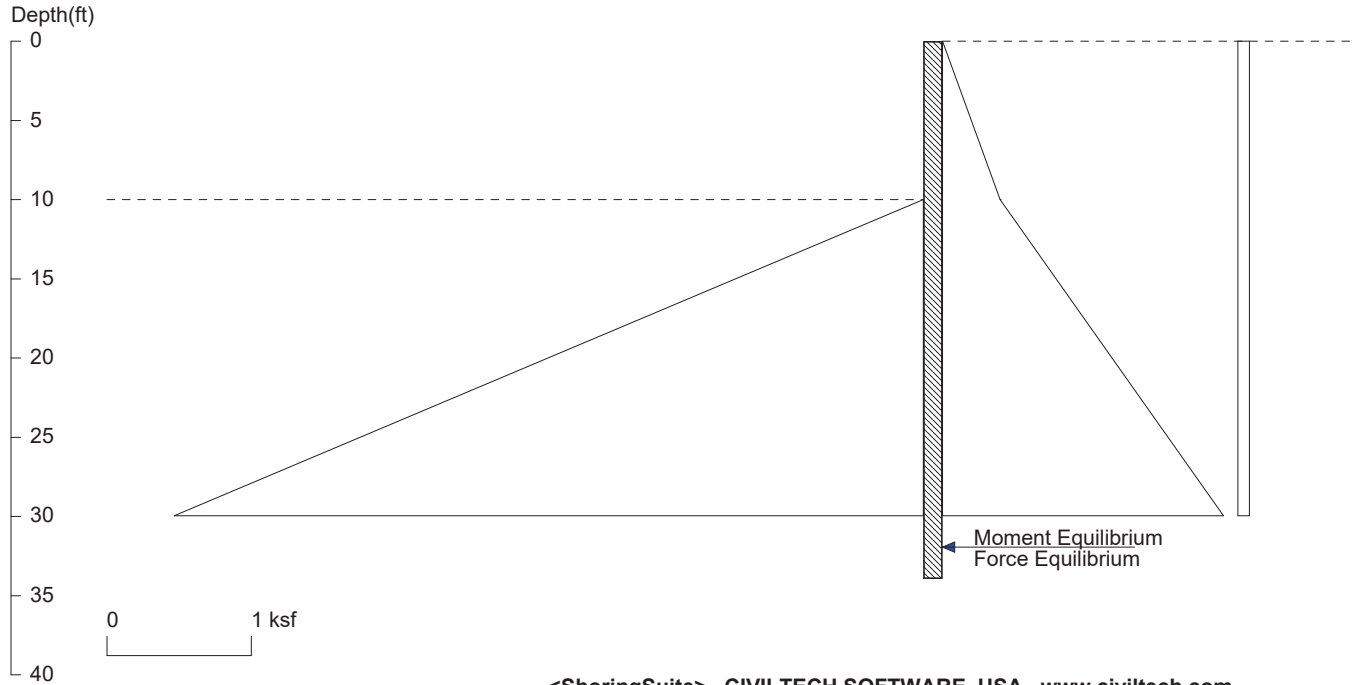
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	10	0.000
Water Table	10	0.000
Bottom of Sheet Piling	50	10.400



10' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE



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Licensed to 4324324234 3424343 Date: 12/7/2023
 File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\10 ft sheet pile wall 10 ft BGS Water.sh8
 Wall Height=10.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=23.93 Min. Pile Length=33.93
 MOMENT IN PILE: Max. Moment=43.58 per Pile Spacing=1.0 at Depth=21.72

PILE SELECTION:
 Request Min. Section Modulus = 22.0 in³/ft=1183.29 cm³/m, F_y= 36 ksi = 248 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 0.82(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	10	.4	0.040000
10	.4	50	3.50	0.077500
0	0.08	50	0.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
10	0	50	10.4	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	10.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 12.5' deep excavation, No dewatering and water table at 0' BGS

H (ft)	50
D1 (ft)	0
D2 (ft)	37.5
D3 (ft)	10.5
H-D2 Excavation Depth (ft)	12.5

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

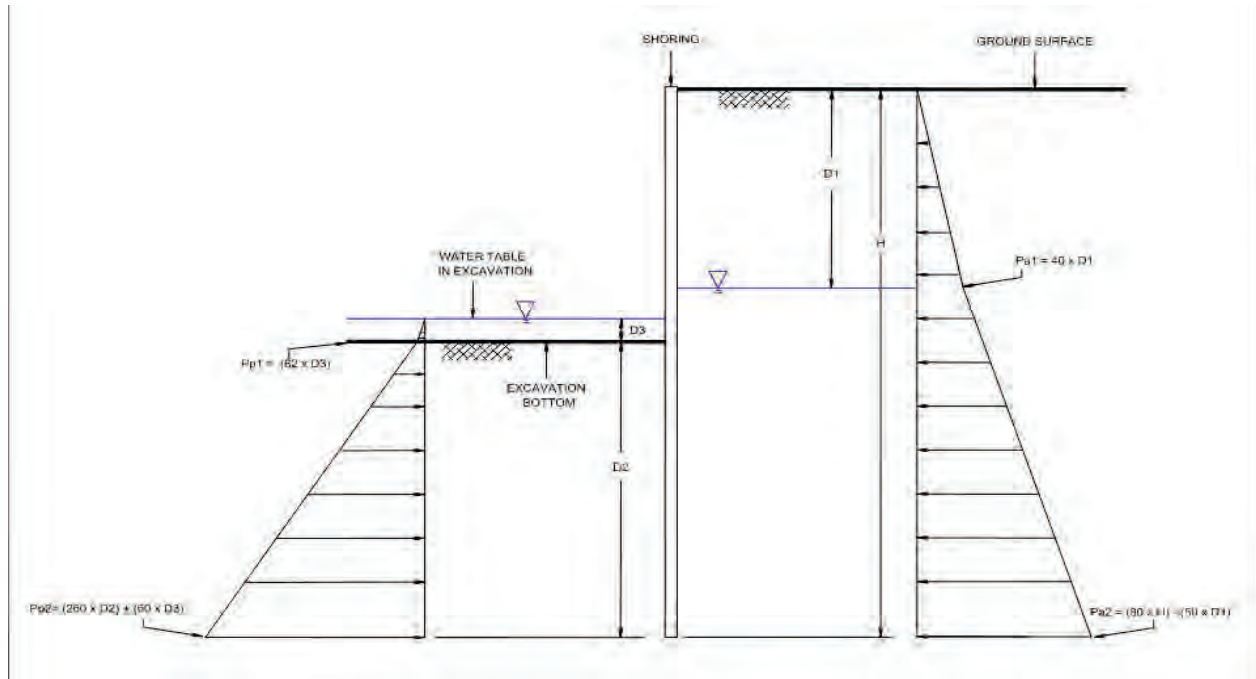
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	0	0.000
Bottom of Excavation	12.5	1.000
Bottom of Sheet Piling	50	4.000

Surcharge

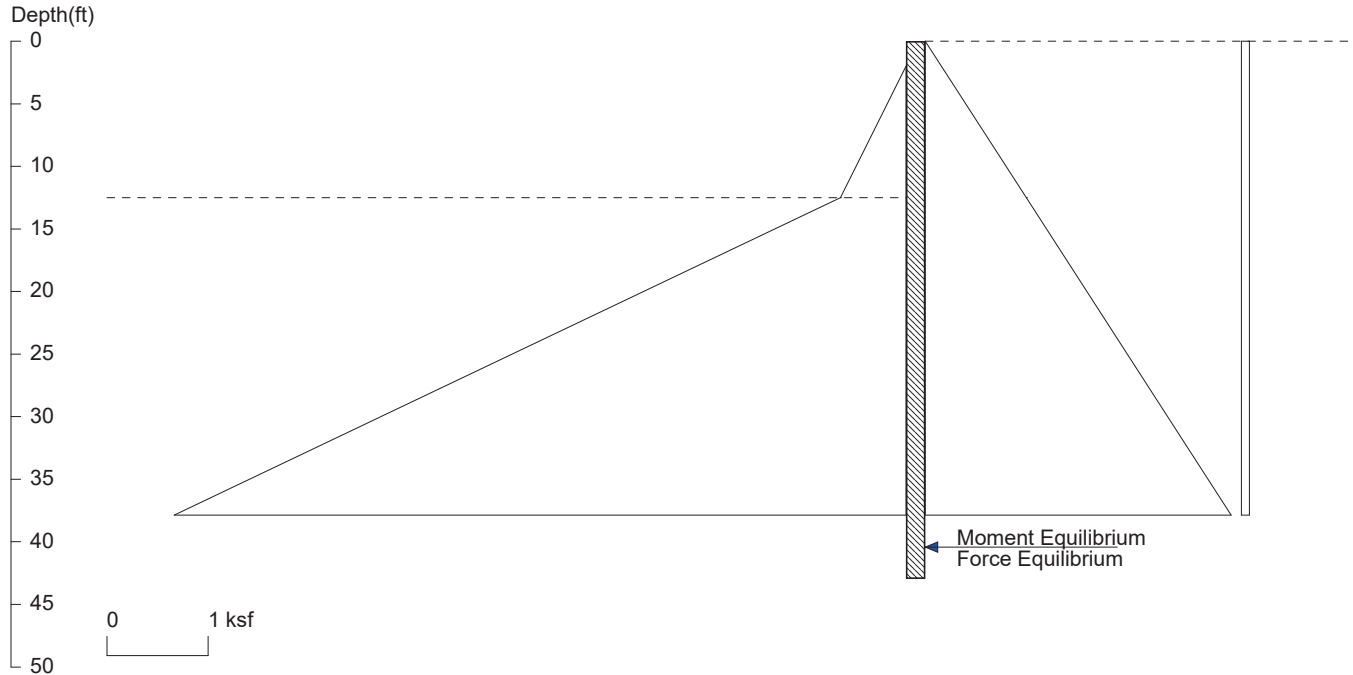
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	12.5	0.651
Water Table	2	0.000
Bottom of Sheet Piling	50	10.401



12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\12p5 ft sheet pile wall 0 ft BGS Water.sh8

Wall Height=12.5 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=30.45 Min. Pile Length=42.95
 MOMENT IN PILE: Max. Moment=90.08 per Pile Spacing=1.0 at Depth=27.35

PILE SELECTION:

Request Min. Section Modulus = 32.8 in³/ft=1761.04 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 2.09(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	12.5	1	0.080000
12.5	1	50	4	0.080000
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
2	0	12.5	.651	0.0620
12.5	.651	50	10.40	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	12.50	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 12.5' deep excavation, No dewatering and water table at 5' BGS

H (ft)	50
D1 (ft)	5
D2 (ft)	37.5
D3 (ft)	5.5
H-D2 Excavation Depth (ft)	12.5

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

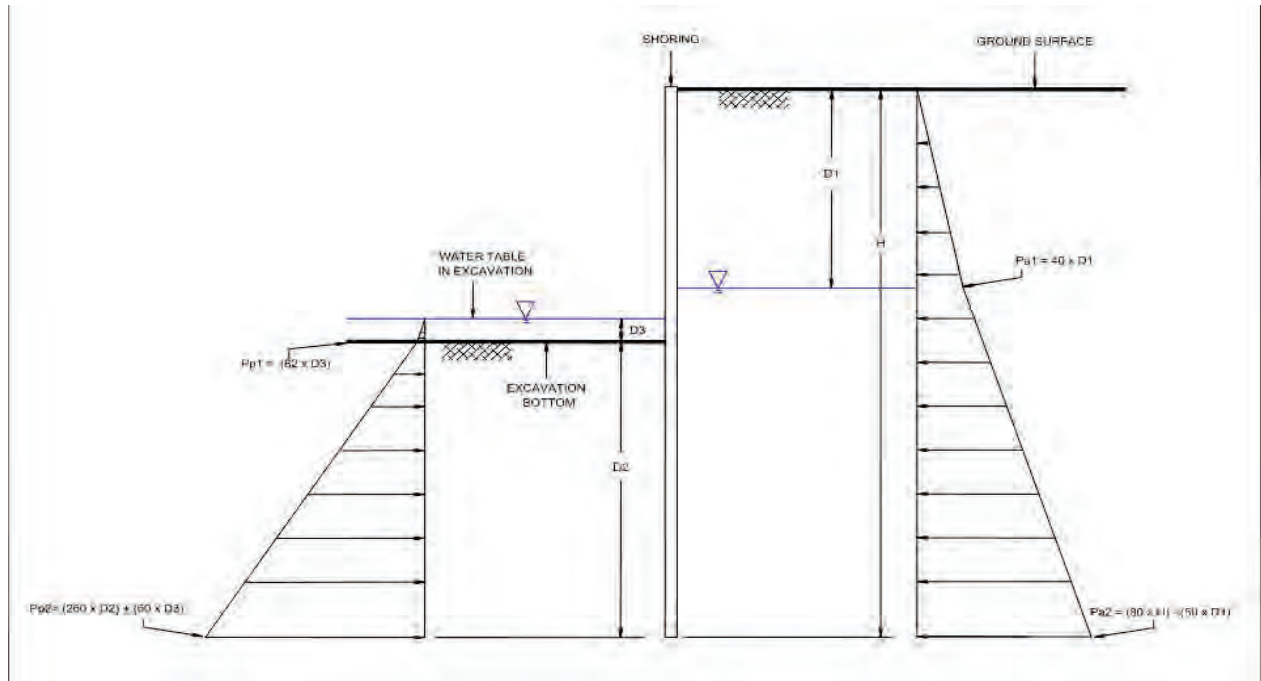
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	5	0.200
Bottom of Excavation	12.5	0.792
Bottom of Sheet Piling	50	3.750

Surcharge

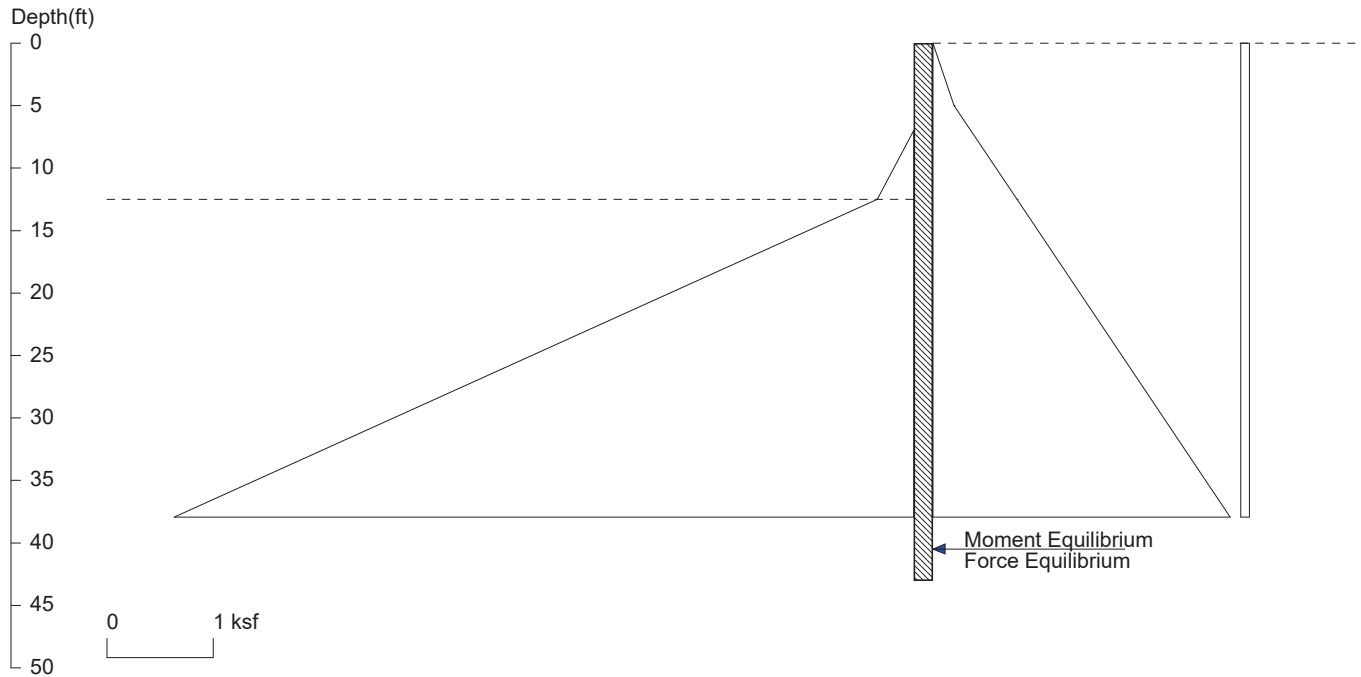
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	7	0.000
Water Table	12.5	0.341
Bottom of Sheet Piling	50	10.091



12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\12p5 ft sheet pile wall 5 ft BGS Water.sh8

Wall Height=12.5 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=30.53 Min. Pile Length=43.03
 MOMENT IN PILE: Max. Moment=88.63 per Pile Spacing=1.0 at Depth=27.52

PILE SELECTION:

Request Min. Section Modulus = 32.2 in³/ft=1732.56 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 2.04(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	5	.2	0.040000
5	.2	12.5	.792	0.078933
12.5	.792	50	3.75	0.078880
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
7	0	12.5	.341	0.0620
12.5	.341	50	10.091	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	12.50	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 12.5' deep excavation, No dewatering and water table at 10' BGS

H (ft)	50
D1 (ft)	10
D2 (ft)	37.5
D3 (ft)	0.5
H-D2 Excavation Depth (ft)	12.5

Active Pressure + Water

Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	10	0.400
Bottom of Excavation	12.5	0.594
Bottom of Sheet Piling	50	3.500

Surcharge

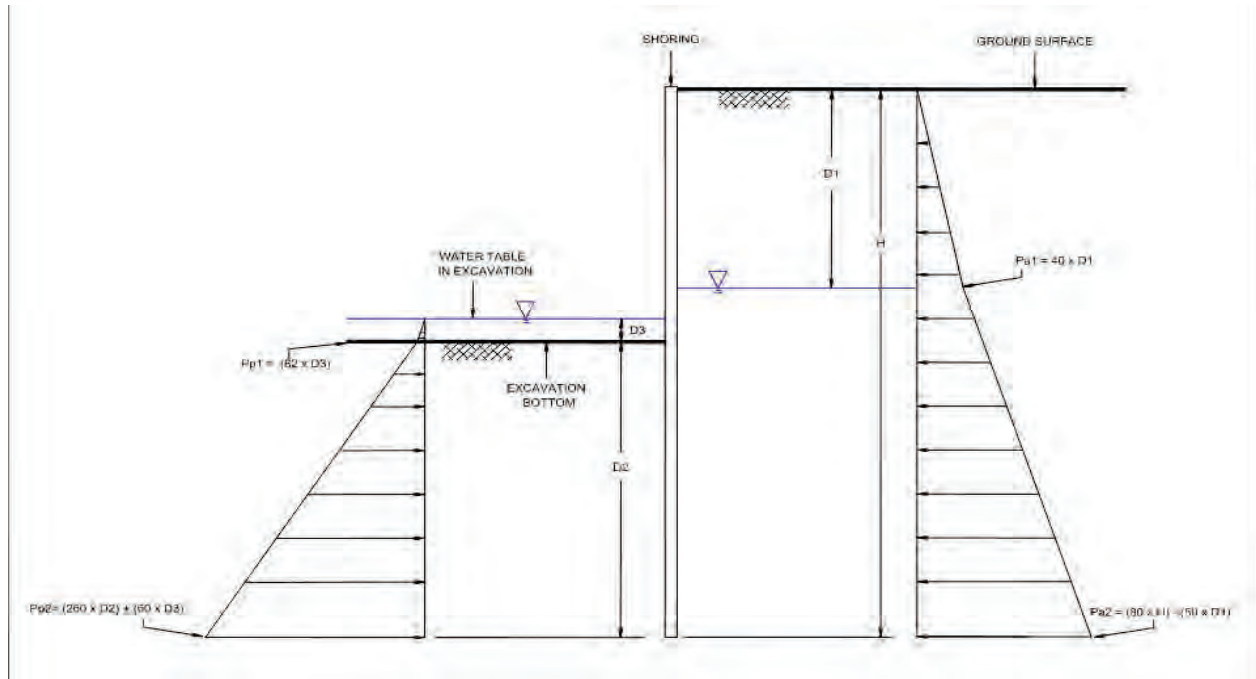
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

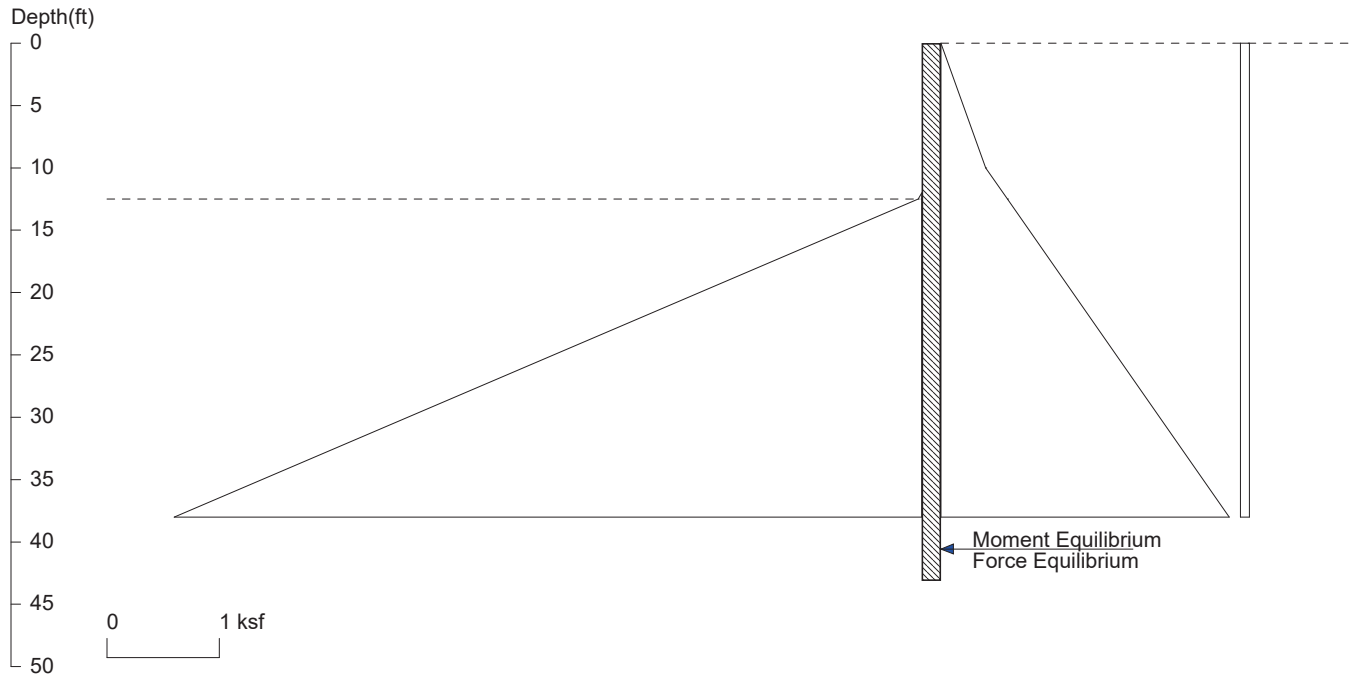
Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	12	0.000
Water Table	12.5	0.031
Bottom of Sheet Piling	50	9.781



12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\12p5 ft sheet pile wall 10 ft BGS Water.sh8

Wall Height=12.5 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=30.61 Min. Pile Length=43.11
 MOMENT IN PILE: Max. Moment=87.17 per Pile Spacing=1.0 at Depth=27.66

PILE SELECTION:

Request Min. Section Modulus = 31.7 in³/ft=1704.01 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 2.00(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	10	.4	0.040000
10	.4	12.5	.594	0.077600
12.5	.594	50	3.50	0.077493
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
12	0	12.5	.031	0.0620
12.5	.031	50	9.781	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	12.50	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 12.5' BELOW GROUND SURFACE

Port of Everett Shoring

Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 12.5' deep excavation, No dewatering and water table at 12.5' BGS

H (ft)	50
D1 (ft)	12.5
D2 (ft)	37.5
D3 (ft)	0
H-D2 Excavation Depth (ft)	12.5

Active Pressure + Water

Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	12.5	0.500
Bottom of Excavation	12.5	0.500
Bottom of Sheet Piling	50	3.375

Surcharge

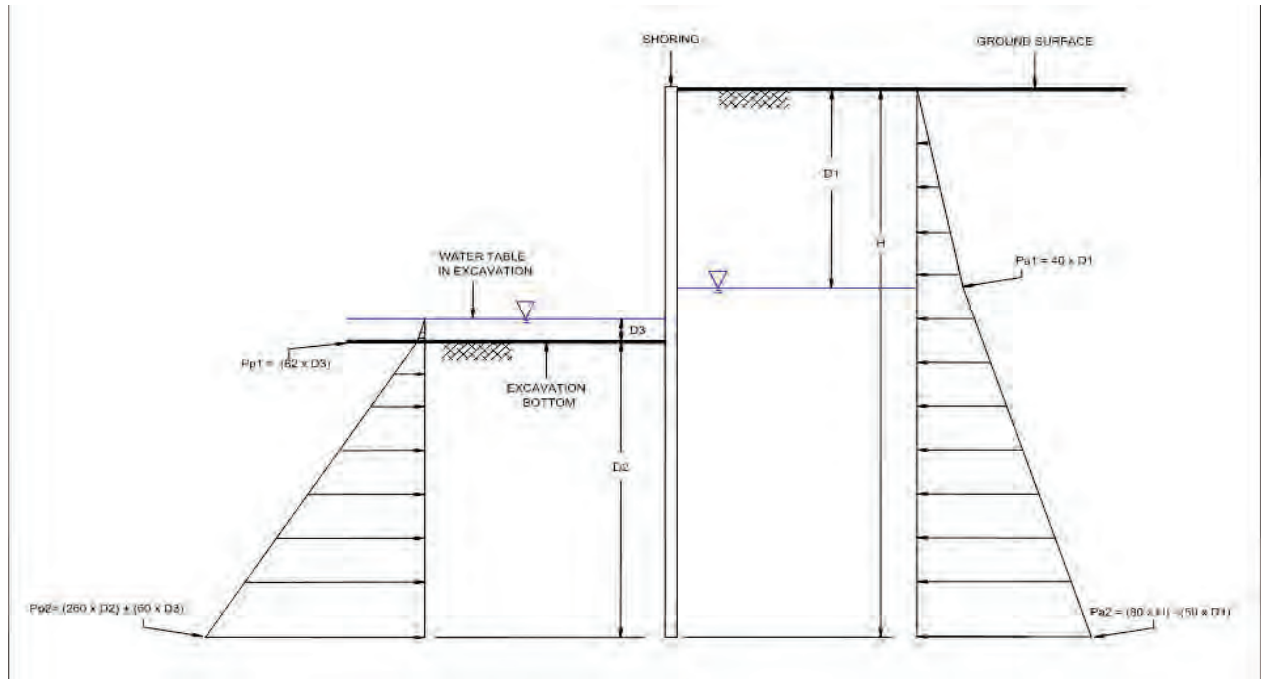
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	50	0.080

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

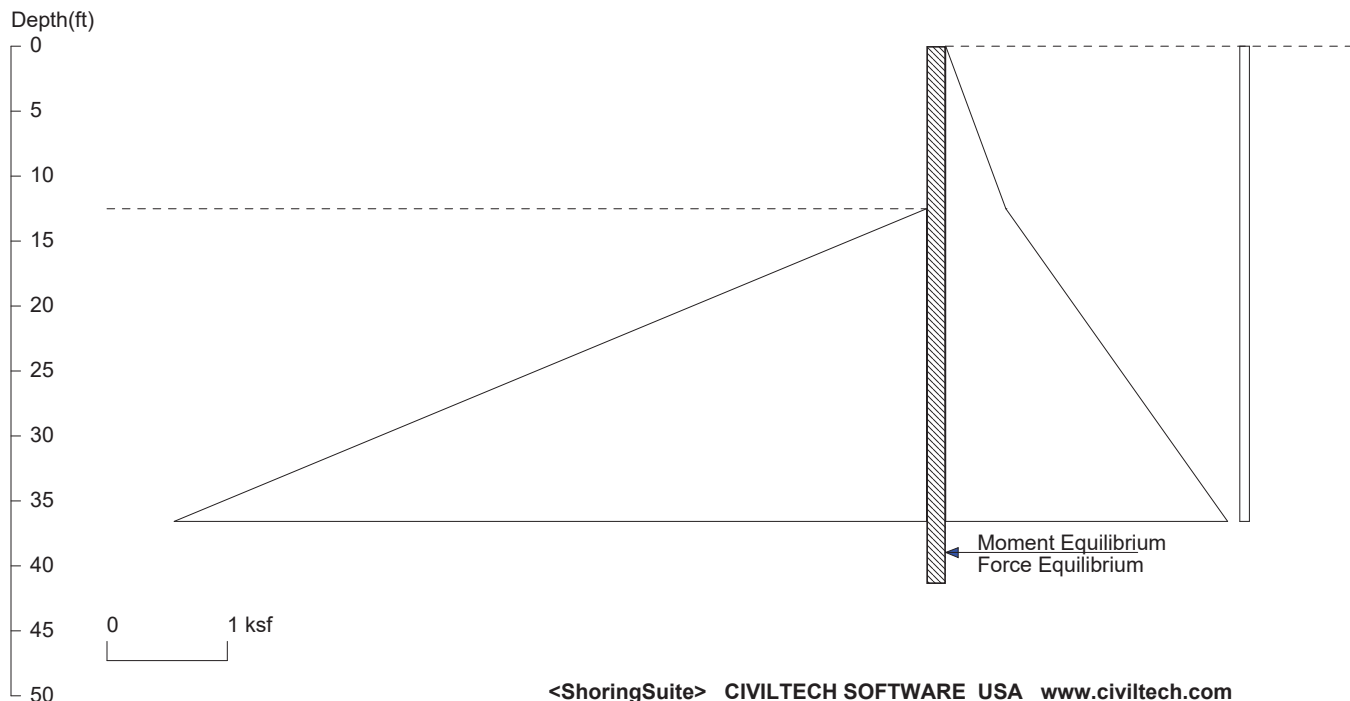
Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	12.5	0.000
Water Table	12.5	0.000
Bottom of Sheet Piling	50	9.750



12.5' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 12.5' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\12p5 ft sheet pile wall 12p5 ft BGS Water.sh8

Wall Height=12.5 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=28.88 Min. Pile Length=41.38
 MOMENT IN PILE: Max. Moment=77.47 per Pile Spacing=1.0 at Depth=26.65

PILE SELECTION:

Request Min. Section Modulus = 28.2 in³/ft=1514.42 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.66
 AZ19 has Section Modulus = 36.1 in³/ft=1940.74 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 1.76(in) based on E (ksi)=29000.00 and I (in⁴)/foot=270.8

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	12.5	.5	0.040000
12.5	.5	50	3.375	0.076667
0	.08	50	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
12.5	0	50	9.75	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	12.50	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width, Spacing, Diameter, Length, and Depth - ft; Force - kip; Moment - kip-ft
 Friction, Bearing, and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 15' deep excavation, No dewatering and water table at 0' BGS

H (ft)	60
D1 (ft)	0
D2 (ft)	45
D3 (ft)	13
H-D2 Excavation Depth (ft)	15

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

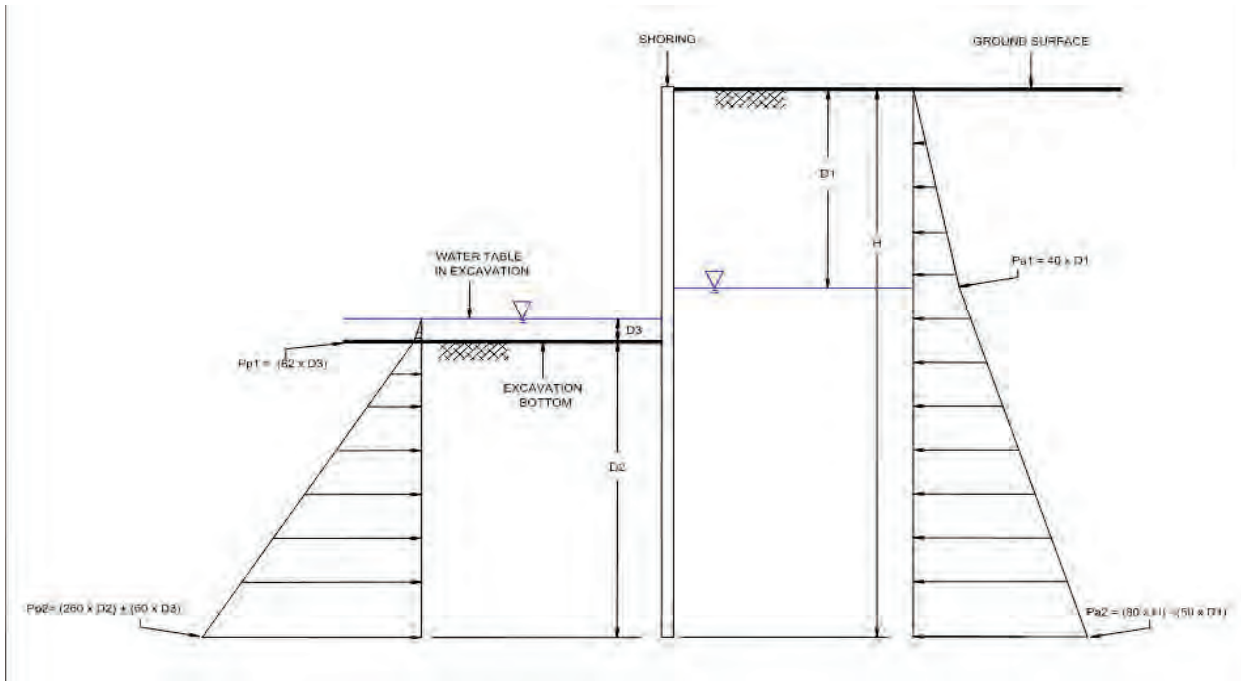
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	0	0.000
Bottom of Excavation	15	1.200
Bottom of Sheet Piling	60	4.800

Surcharge

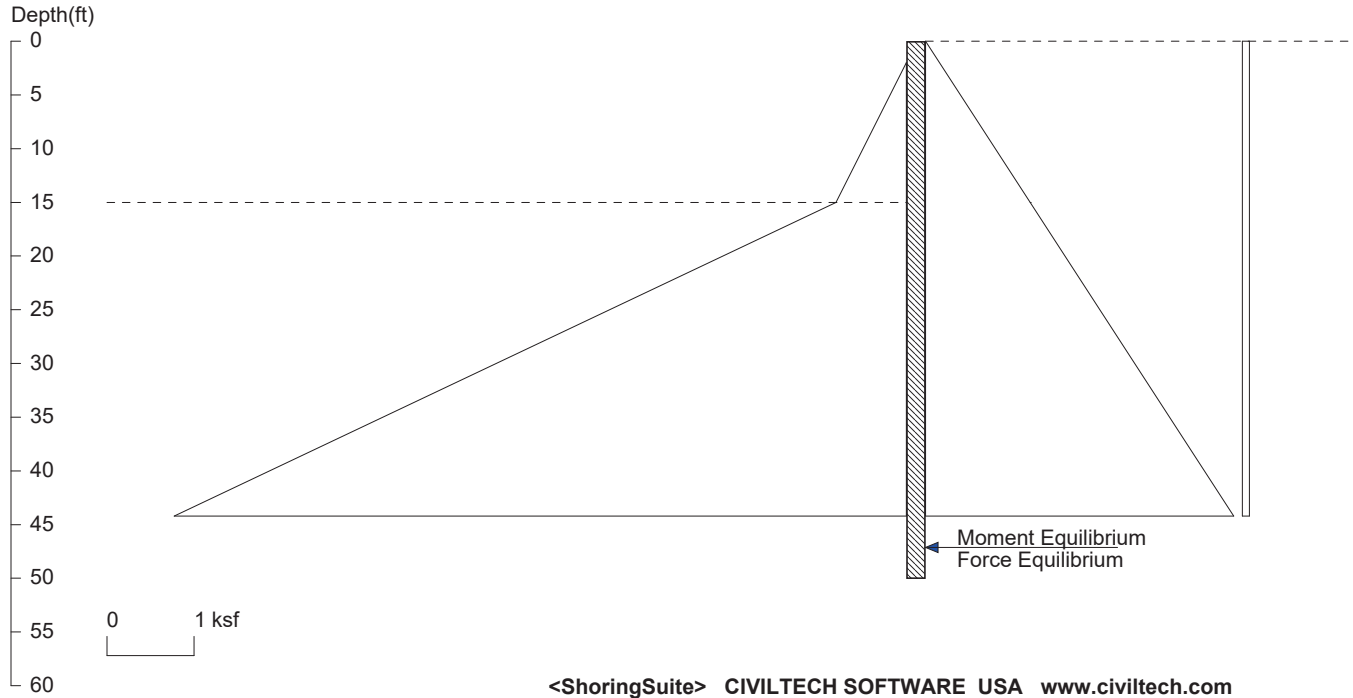
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	60	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	15	0.806
Water Table	2	0.000
Bottom of Sheet Piling	60	12.506



15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 0' BELOW GROUND SURFACE



Licensed to 4324324234 3424343 Date: 12/7/2023
 File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\15 ft sheet pile wall 0 BGS Water.sh8
 Wall Height=15.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=35.05 Min. Pile Length=50.05
 MOMENT IN PILE: Max. Moment=138.54 per Pile Spacing=1.0 at Depth=32.01

PILE SELECTION:
 Request Min. Section Modulus = 49.6 in³/ft=2667.85 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.67
 AZ34 has Section Modulus = 63.8 in³/ft=3429.89 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 1.96(in) based on E (ksi)=29000.00 and I (in⁴)/foot=576.3

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	15	1.2	0.080000
15	1.2	60	4.8	0.080000
0	.08	60	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
2	0	15	.806	0.0620
15	.806	60	12.506	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 15' deep excavation, No dewatering and water table at 5' BGS

H (ft)	60
D1 (ft)	5
D2 (ft)	45
D3 (ft)	8
H-D2 Excavation Depth (ft)	15

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

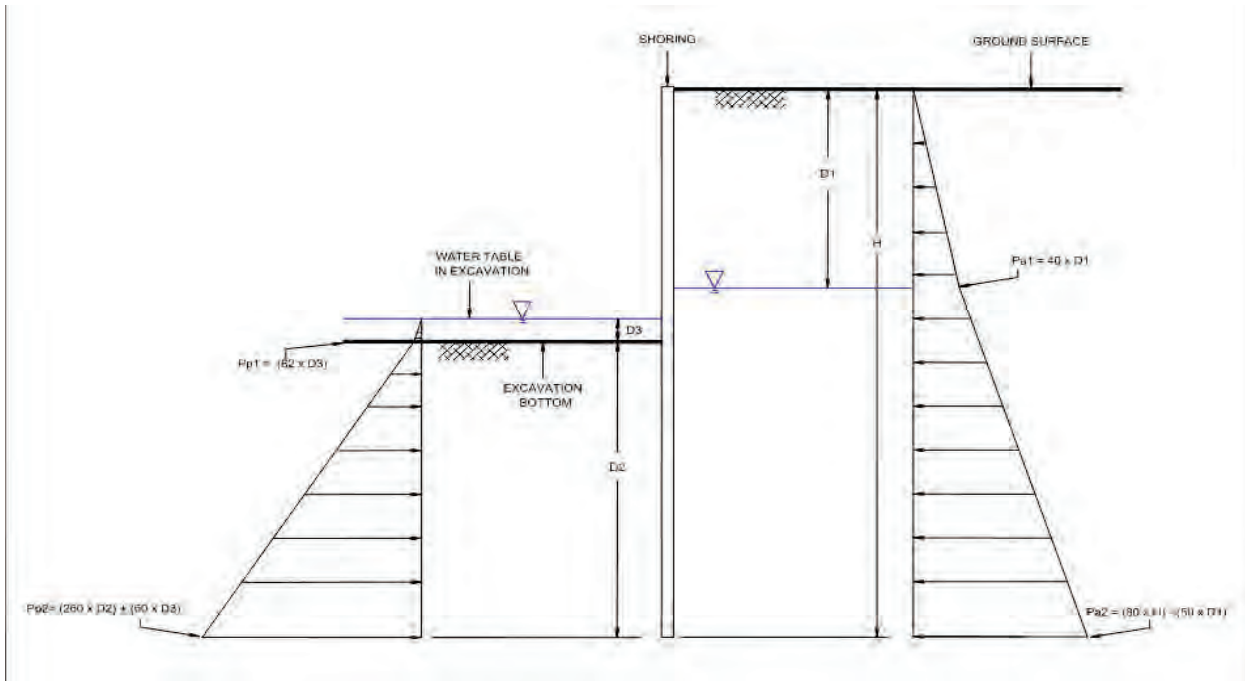
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	5	0.200
Bottom of Excavation	15	0.991
Bottom of Sheet Piling	60	4.550

Surcharge

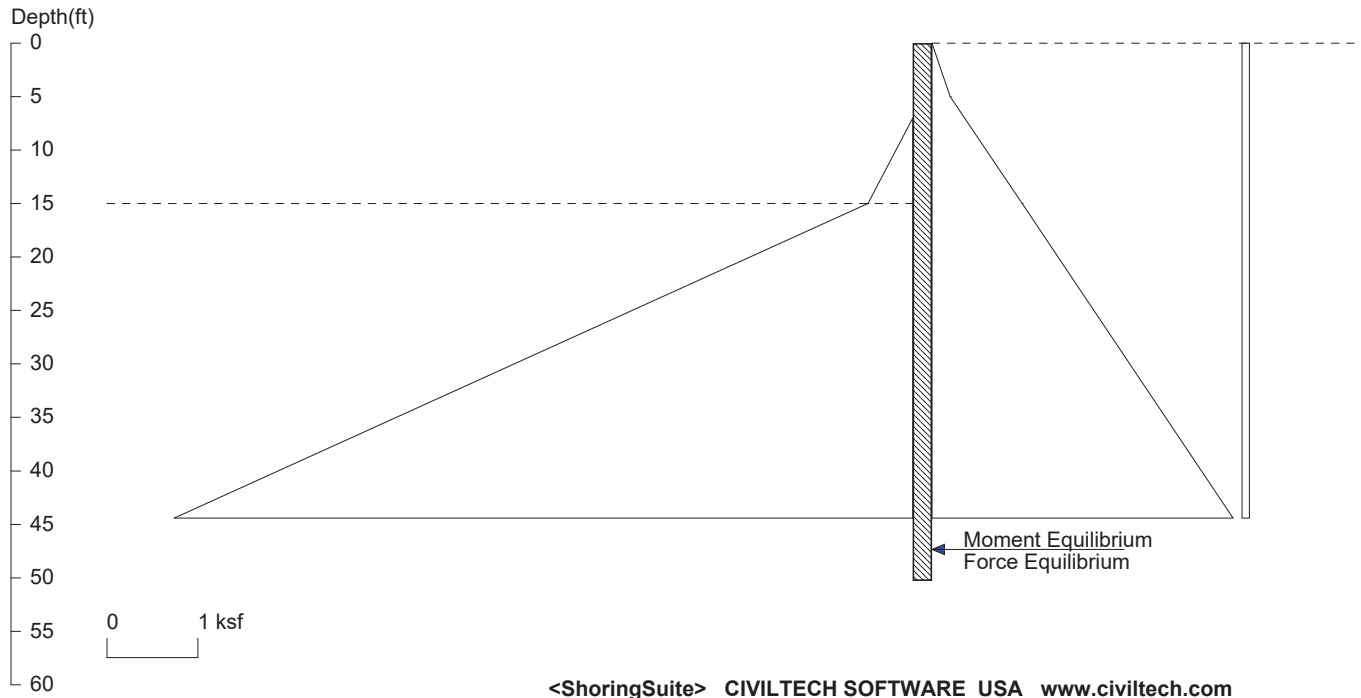
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	60	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	15	0.496
Water Table	7	0.000
Bottom of Sheet Piling	60	12.196



15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 5' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\15 ft sheet pile wall 5 BGS Water.sh8

Wall Height=15.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=35.28 Min. Pile Length=50.28
 MOMENT IN PILE: Max. Moment=138.81 per Pile Spacing=1.0 at Depth=32.25

PILE SELECTION:

Request Min. Section Modulus = 49.7 in³/ft=2673.11 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.67
 AZ34 has Section Modulus = 63.8 in³/ft=3429.89 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 1.94(in) based on E (ksi)=29000.00 and I (in⁴)/foot=576.3

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	5	.2	0.040000
5	.2	15	.991	0.079100
15	.991	60	4.550	0.079089
0	.08	60	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
7	0	15	.496	0.0620
15	.496	60	12.196	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 15' deep excavation, No dewatering and water table at 10' BGS

H (ft)	60
D1 (ft)	10
D2 (ft)	45
D3 (ft)	3
H-D2 Excavation Depth (ft)	15

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

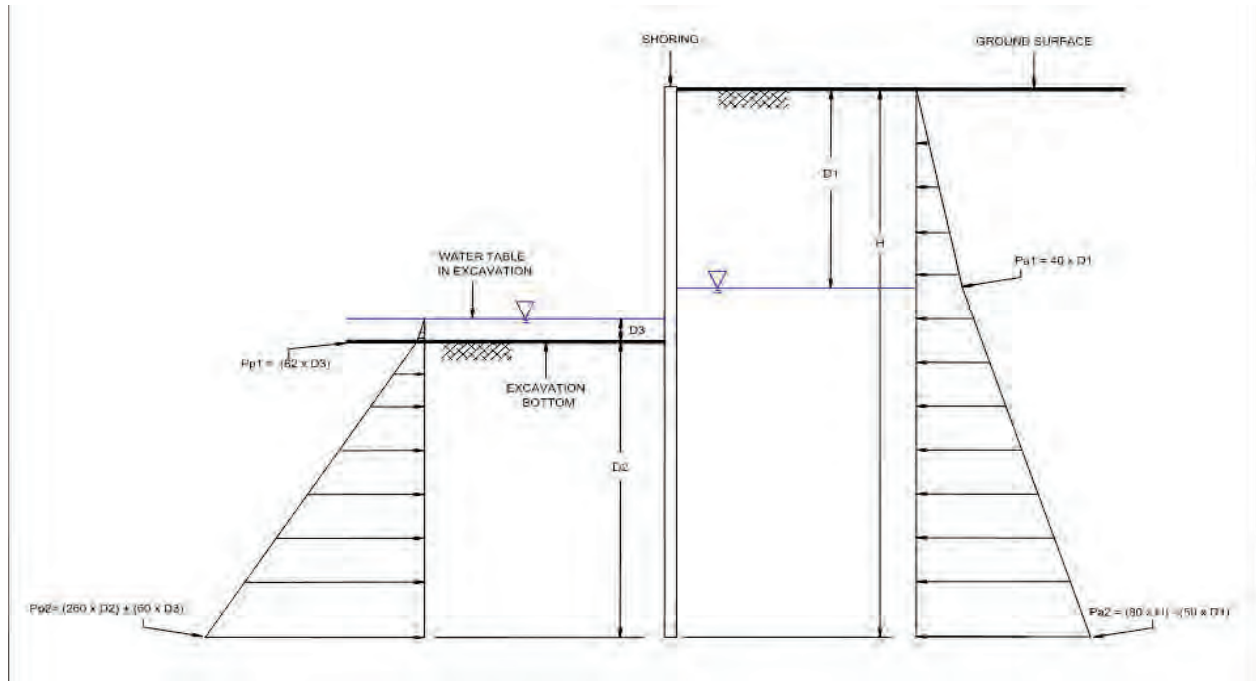
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	10	0.400
Bottom of Excavation	15	0.790
Bottom of Sheet Piling	60	4.300

Surcharge

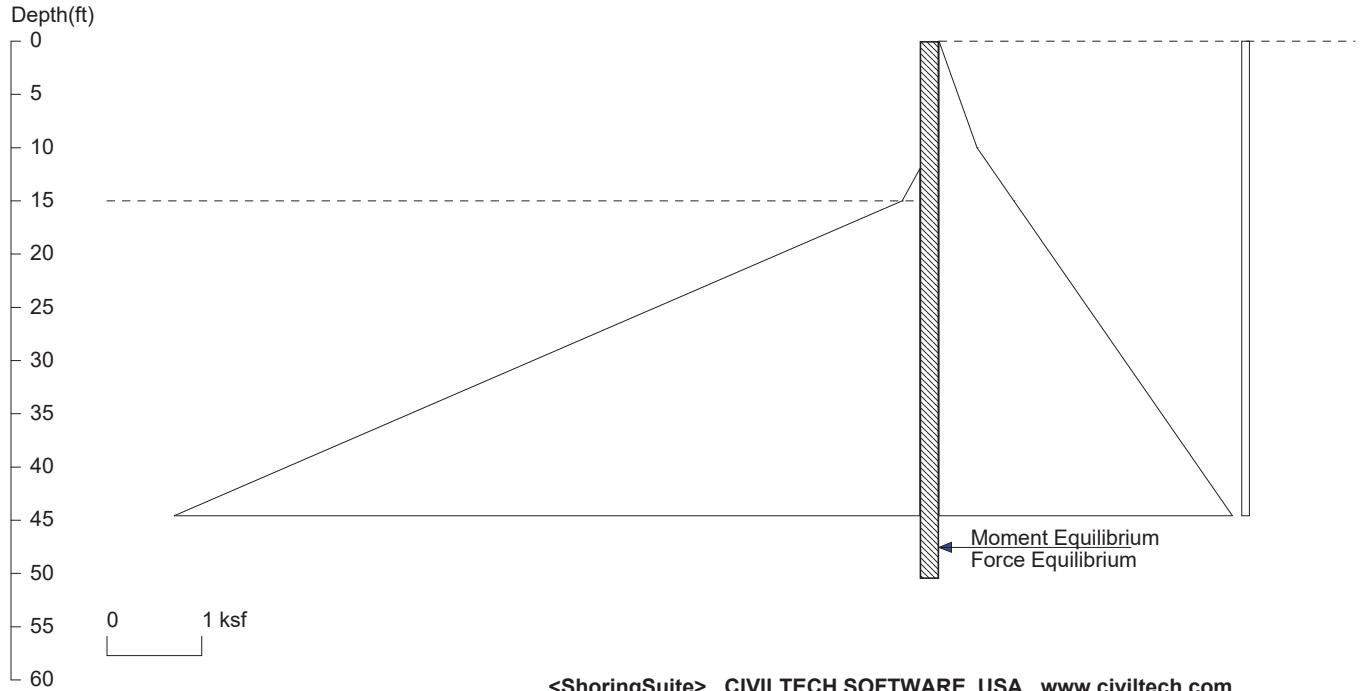
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	60	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	15	0.000
Water Table	12	0.186
Bottom of Sheet Piling	60	11.886



15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 10' BELOW GROUND SURFACE



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 File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\15 ft sheet pile wall 10 BGS Water.sh8
 Wall Height=15.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=35.50 Min. Pile Length=50.50
 MOMENT IN PILE: Max. Moment=138.72 per Pile Spacing=1.0 at Depth=32.49

PILE SELECTION:
 Request Min. Section Modulus = 49.7 in³/ft=2671.37 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.67
 AZ34 has Section Modulus = 63.8 in³/ft=3429.89 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 1.91(in) based on E (ksi)=29000.00 and I (in⁴)/foot=576.3

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	10	.4	0.040000
10	.4	15	.790	0.078000
15	.790	60	4.300	0.078000
0	.08	60	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
12	0	15	.186	0.0620
15	.186	60	11.886	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in

15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 15' BELOW GROUND SURFACE

Port of Everett Shoring
 Calculation of soil pressures for use in shoring wall design

Section Location Sheet pile loading at 15' deep excavation, No dewatering and water table at 15' BGS

H (ft)	60
D1 (ft)	15
D2 (ft)	45
D3 (ft)	0
H-D2 Excavation Depth (ft)	15

Calculations assume that the water table inside excavation is 2' lower than outside excavation, except for the condition where the groundwater is at the bottom of excavation elevation.

Surcharge pressure equivalent to an additional 2' of soil weight is added to loading

Active Pressure + Water

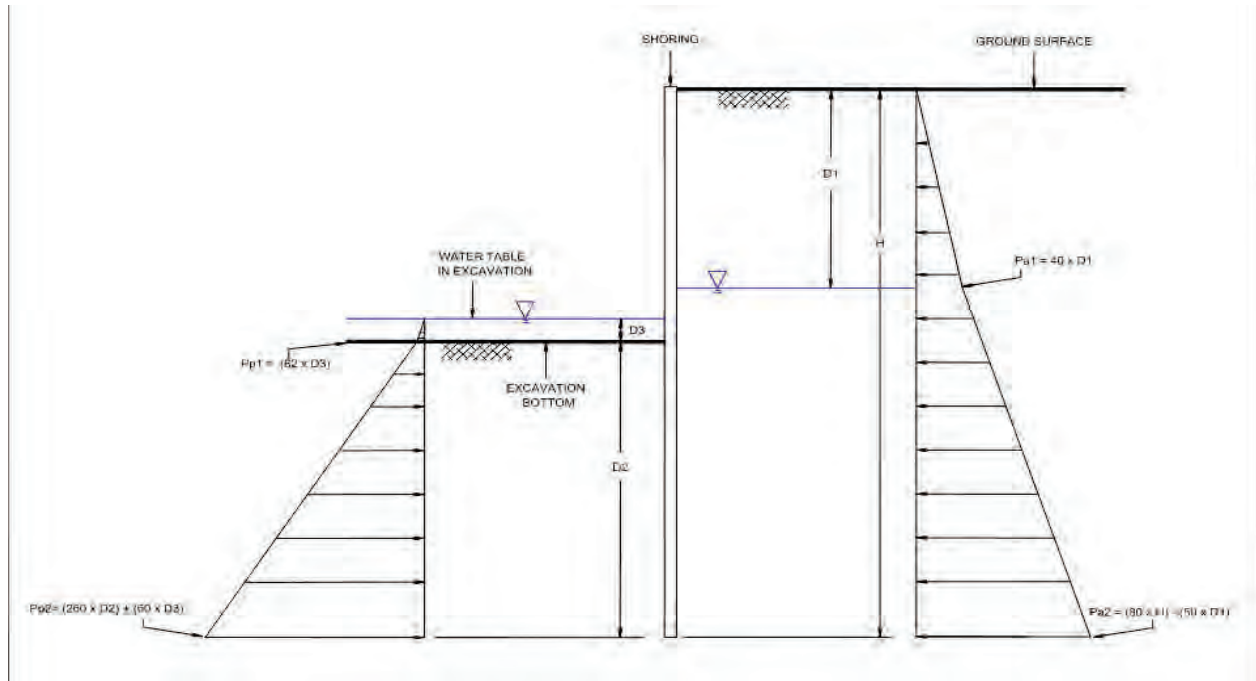
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.000
Groundwater Surface Outside Excavation	15	0.600
Bottom of Excavation	15	0.600
Bottom of Sheet Piling	60	4.050

Surcharge

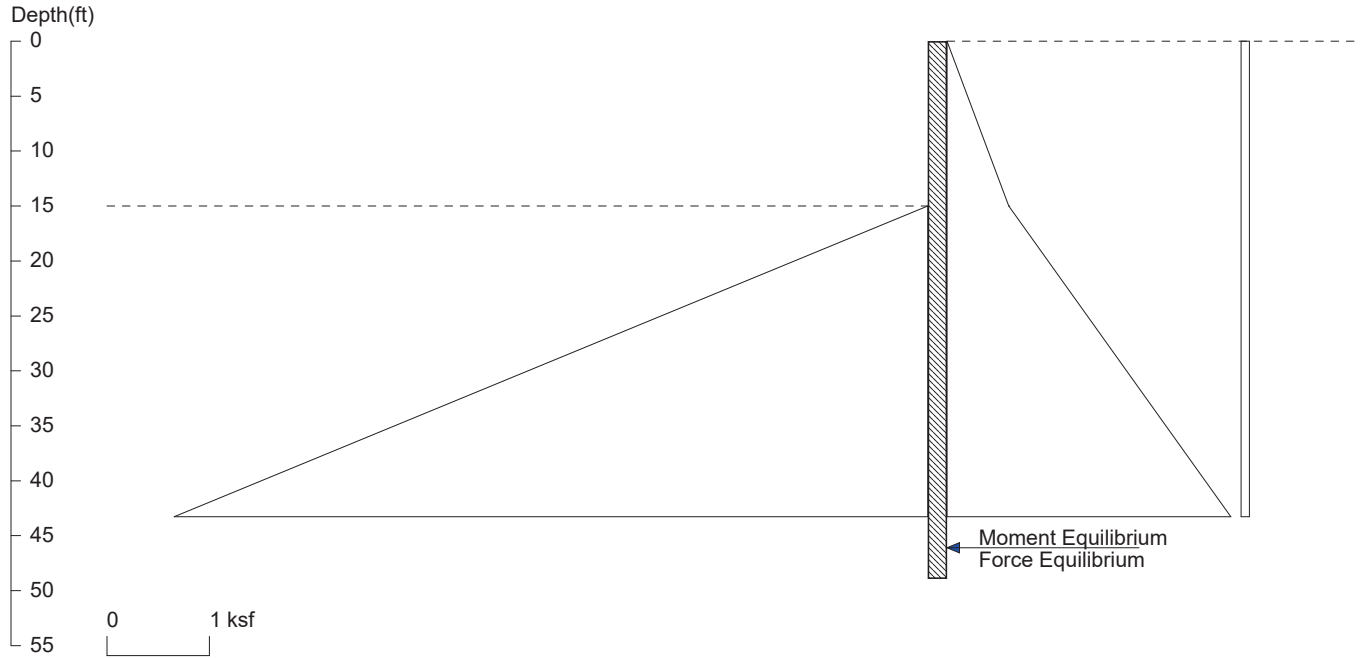
Location	Depth BGS (ft)	Active Pressure (ksf)
Top of Excavation	0	0.080
Bottom of Sheet Piling	60	0.080

Passive Pressure

Location	Depth BGS (ft)	Passive Pressure (ksf)
Bottom of Excavation	15	0.000
Water Table	15	0.000
Bottom of Sheet Piling	60	11.700



15' EXCAVATION WITH NO DEWATERING AND WATER TABLE AT 15' BELOW GROUND SURFACE



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Date: 12/7/2023

File: D:\Projects (Use Network Drive)\Port of Everett Sheet Piling\Shoring 8\15 ft sheet pile wall 15 BGS Water.sh8

Wall Height=15.0 Pile Diameter=1.0 Pile Spacing=1.0 Wall Type: 1. Sheet Pile

PILE LENGTH: Min. Embedment=33.92 Min. Pile Length=48.92
 MOMENT IN PILE: Max. Moment=125.78 per Pile Spacing=1.0 at Depth=31.58

PILE SELECTION:

Request Min. Section Modulus = 45.1 in³/ft=2422.25 cm³/m, F_y= 50 ksi = 345 MPa, F_b/F_y=0.67
 AZ34 has Section Modulus = 63.8 in³/ft=3429.89 cm³/m. It is greater than Min. Requirements!
 Top Deflection = 1.71(in) based on E (ksi)=29000.00 and I (in⁴)/foot=576.3

DRIVING PRESSURES (ACTIVE, WATER, & SURCHARGE):

Z1	P1	Z2	P2	Slope
0	0	15	.6	0.040000
15	.6	60	4.05	0.076667
0	.08	60	.08	0.000000

PASSIVE PRESSURES: Pressures below will be divided by a Factor of Safety =1.3

Z1	P1	Z2	P2	Slope
15	0	60	11.7	0.2600

ACTIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00
2	15.00	1.00

PASSIVE SPACING:

No.	Z depth	Spacing
1	0.00	1.00

UNITS: Width,Spacing,Diameter,Length,and Depth - ft; Force - kip; Moment - kip-ft
 Friction,Bearing,and Pressure - ksf; Pres. Slope - kip/ft³; Deflection - in



Geotechnical Investigation Report

ExxonMobil ADC
2717/2731 Federal Avenue
Everett, Washington 98201
Ecology Site ID 2728

June 6, 2023

Prepared for:

ExxonMobil Environmental and Property
Solutions Company and American
Distributing Company

Prepared by:

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Approved by _____
(signature)

Bobby Thompson, Project Manager

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Abbreviations

2010 Order	Agreed Order DE 6184
AASHTO	American Association of State Highway and Transportation Officials
AC	Asphalt concrete
ADC	American Distributing Company
amsl	above mean sea level
AST	Aboveground storage tank
AUUL	Advanced Underground Utility Locating
bgs	Below ground surface
BNSF	Burlington Northern Santa Fe
Contractor	Stantec's selected prime contractor for the Project
Ecology	Washington State Department of Ecology
ExxonMobil	ExxonMobil Oil Company
GW	Fine to medium gravel
HASP	Health and safety plan
HMA	Hot mix asphalt
JD & S	JD & S Testing
KC	Kimberly-Clark Corporation
LNAPL	Light non-aqueous phase liquid
ML	Silt
NAVD88	North American Vertical Datum of 1988
N-value	Standard penetration resistance using an SPT sampler
OSHA	Occupational Safety and Health Administration
PHCO	Petroleum hydrocarbon odors
Plans	Constructions drawings
Project	Remedial excavation of the ExxonMobil ADC Property and immediate surrounding areas
Project Manager	Stantec Project Manager
Property	ExxonMobil and ADC-owned parcels located at 2717 and 2731 Federal Avenue, in Everett, Washington
psf/ft	Pounds per square foot per foot
psi	Pounds per square inch
SC	Clayey sand
Site	ExxonMobil and ADC Property and the surrounding parcels where hydrocarbons have migrated
SM	Silty sand
SP	Poorly-graded sand
SPT	Standard Penetration Test (a specific soil sampling tool and method)



Standard Specifications	Washington State Department of Transportation's <i>Standard Specifications for Road, Bridge, and Municipal Construction 2023</i>
Stantec	Stantec Consulting Services Inc.
SW	Well-graded sand
USCS	Unified Soil Classification System
USGS	United States Geological Survey
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
WSP	WSP USA Environmental & Infrastructure, Inc. (successor to Wood Environment & Infrastructure Solutions, Inc.)



INTRODUCTION

1.0 INTRODUCTION

This *Geotechnical Investigation Report* was prepared for the ExxonMobil ADC Site (Site) located at 2717/2731 Federal Avenue, Everett, Snohomish County, Washington (Property), adjacent to Port Gardner Bay as shown on **Figures 1 and 2**. The Property consists of three tax parcels including 00437161900101, 00437161900100, and 00437161901000, occupying approximately 0.86 acre of land as shown on **Figure 3**. The two northern parcels at 2717 Federal Avenue are owned by American Distributing Company (ADC) and cover approximately two-thirds (0.65 acre) of the Property. The southern parcel at 2731 Federal Avenue is owned by ExxonMobil Oil Corporation (ExxonMobil), covering the remaining approximate one-third (0.21 acre) of the Property. Two City of Everett rights-of-way are located immediately east and south of the Property boundary.

1.1 HISTORICAL OPERATIONS AND INADVERTENT RELEASES/SPILLS AT THE PROPERTY

Historical ExxonMobil and ADC operations at the Property (early 1920s through early 1990s) included bulk petroleum storage, transfer, and distribution. Aboveground storage tanks (ASTs), loading racks (for marine, truck, and rail loading/off-loading), warehouses, pump houses, piping, drum storage areas, and offices formerly occupied the Property. Petroleum products primarily included the following: fuel oils, stove oil, Bunker C fuel oil, diesel, and gasoline with smaller amounts of synthetic blends and petroleum-based fluids. By the late 1990s, all ExxonMobil and ADC facilities were removed and, currently, the Property is an asphalt-paved parking lot.

Historical releases of petroleum products occurred with evidence of surface spills at the loading/unloading racks, drum storage areas, and around the bases of the ASTs observed during a preliminary environmental assessment in 1985. Subsequent assessments (soil borings and groundwater monitoring wells) have revealed heavy-range petroleum hydrocarbons and LNAPL (light non-aqueous phase liquid) floating on shallow groundwater beneath the Property.

1.2 AGREED ORDER WITH THE WASHINGTON STATE DEPARTMENT OF ECOLOGY

Due to these historical releases, an Agreed Order (AO) DE 6184 (2010 Order) was agreed upon between the Washington State Department of Ecology (Ecology), ExxonMobil, and ADC in March 2010. The Property is identified in Ecology's databases with Facility Site ID 2728 and Cleanup Site ID 5182. Recent and current environmental work is being conducted in accordance with AO DE 6184 with the most-recent document submitted to Ecology being Stantec's *Draft Site Characterization/Focused Feasibility Study Addendum* (Stantec, 2023a) and *ExxonMobil ADC Draft Cleanup Action Plan* (Stantec, 2023b) in which remedial alternatives were presented for the Site with a recommendation for excavation to optimally remediate the heavy-range petroleum impacts in subsurface Site soil/fill.



SITE LOCATION AND BRIEF SITE DESCRIPTION

1.3 PROPOSED REMEDIAL EXCAVATION WORK

On behalf of ExxonMobil and ADC, ExxonMobil Environmental and Property Solutions intends to conduct a remedial excavation of hydrocarbon-impacted soil within the ExxonMobil ADC Property and immediate surrounding areas. Stantec Consulting Services Inc. (Stantec) is the environmental engineering consultant and project coordinator for management of this project for ExxonMobil Environmental and Property Solutions.

The remedial excavation (Project) includes:

- Utility protection, rerouting, and reconnection.
- Installation of approximately 600 linear feet of sheet pile shoring.
- Excavation of hydrocarbon impacted soil to pre-determined depths above and below the water table (approximately 17,500 cubic yards total).
- Dewatering or amendment of wet soil as required for disposal facility acceptance.
- Transport of excavated soil to a specified disposal facility.
- Backfill with specified materials at various depths.
- Restoration of surface grade.

Toward this goal, Stantec conducted a geotechnical investigation to supplement a shoring design for the remedial excavation. As detailed in this report, the investigation consisted of drilling and sampling five (5) geotechnical soil borings (GB-5 through GB-9; **Figure 3**).

2.0 SITE LOCATION AND BRIEF SITE DESCRIPTION

The Property is located east of Federal Avenue and west of the overpass for Terminal Avenue, in the northwest portion of Everett, Snohomish County, Washington (**Figures 1 and 2**). Immediately north of the Property is the former Kimberly-Clark Corporation (KC) parcel and former Everett Avenue. Immediately east of the Property is Burlington Northern Santa Fe (BNSF) railroad land. As noted in **Section 1**, the Property is currently an asphalt-paved parking lot.

It should be noted that the Terminal Avenue overpass is founded on a deep foundation system and the projected load from the footings does not intercept the proposed remedial excavation shoring system. That said, surcharge loading from the over pass should not need to be incorporated into the remedial excavation shoring design.

The surrounding area consists of roadways and industrial buildings surrounded by parking and storage areas. The City of Everett's Land Use Designation for the Property and surrounding parcels is "Industrial." The City's Zoning District Map goes further and shows the Property and surrounding parcels as "H1," defined as "Heavy Industrial" (City of Everett, 2020a and 2020b).

As defined in the 2010 Order, the Site is defined as the property owned by ExxonMobil and ADC, plus those portions of neighboring properties where releases of hazardous substances due to ExxonMobil or ADC operations may have migrated or otherwise come to be located. In addition to historical operations by



PHYSICAL SETTING

ExxonMobil and ADC, another source of contamination at the Site includes releases from former train car loading racks located east of the Property, under the current overpass for Terminal Avenue.

3.0 PHYSICAL SETTING

3.1 TOPOGRAPHY

The Property is located in the southwest quarter of Section 19, Township 29 North, Range 5 East, Willamette Meridian. The nearest surface water is an inlet from Port Gardner Bay at Dunlap Towing, located approximately 300 feet northwest of the Property. The coastline is approximately 500 to 600 feet to the west of the Property.

Ground surface at the Property and immediate vicinity is relatively flat, with an elevation of approximately 12 to 15 feet above mean sea level (amsl) (North American Vertical Datum of 1988 [(NAVD88])). Surface topography in the area slopes gently down to the west, toward Port Gardner Bay. Higher elevations, up to 150 feet amsl, exist east of the Property.

3.2 GEOLOGY AND HYDROGEOLOGY

As documented in WSP USA Environment & Infrastructure Inc.'s (WSP) *SC-FFS*, extensive explorations have been conducted on the Site and in the nearby vicinity which characterize subsurface conditions. These explorations have included soil borings, monitoring wells, test pits, and limited subsurface excavations (the latter for the purpose of interim remedial actions or for the area's subsurface infrastructure installation, upgrades, or repairs).

For ease of review, locations of historical explorations conducted through August 2019 are presented on the Site Plan in **Appendix A**. Lithologic logs collected from these explorations were used to construct representative stratigraphic cross sections of the Property and immediate vicinity. The locations of these cross sections (labeled A-A' through E-E') are shown on the Site Plan in **Appendix A**, and the cross-sections themselves are also provided in **Appendix A**. The Site Plan and cross sections were prepared by Wood Environment & Infrastructure Solutions, Inc (Wood), WSP's predecessor environmental firm. Additional soil investigations post-dating Wood's preparation of the cross sections were performed by Cardno (now Stantec) in 2020 and 2021; as such, Cardno's subsurface data are not reflected on the cross sections.

Based on the 1914 Sanborn map, the Site consisted of low-lying mudflats shown as marshy areas, and the areas near these marshy areas were used by settlers for small residences and dwellings. The marshy areas were likely developed on top of the native near-surface geologic deposits. Settlers likely used the marsh for waste disposal.

Near-surface geology in the area surrounding the Property is characterized by Vashon advance outwash deposits (Qva) and transitional beds (Qtb) (Minard, 1985). The outwash deposits are primarily granular and represent higher energy deposits that were deposited ahead of the Vashon glacier as the glacier melted.



PHYSICAL SETTING

The transitional beds are composed of interbedded clayey, silty fine to medium sand, and the marsh was developed on top of these beds, so it is difficult to distinguish between fill and marsh deposits. The peat deposits noted in the cross sections likely represent the former marsh. The transitional beds are older than the advance outwash deposits and are the primary geologic unit mapped on the Property (Minard, 1985). The contact between the marsh deposits and the transitional beds occurs between 12 and 27 feet below ground surface (bgs).

As documented by WSP and based on subsurface investigations conducted at the Property and surrounding vicinity, the near-surface soils at the Property consist of a heterogeneous mixture of fill materials. The fill materials consist of very loose to medium dense, brown, brownish gray, and gray silty sand and sand with areas of wood and brick debris extending to depths of approximately 5 to 10 feet bgs (corresponding to approximately 5 to 15 feet amsl, NAVD88).

Beginning in the late 1910s/early 1920s, the shoreline at Federal Avenue was gradually extended to the west as the Bay was infilled with sands and silty sands west of the Property and Federal Avenue. Infilling continued until 1976 with today's shoreline present by 1976. Among these typical shoreline silts and sands, significant quantities of organic substances are documented to be present, including wood waste and peat. The high organic content of native soil and fill materials present on the Property and in the immediate vicinity reduces mobility of the weathered petroleum hydrocarbons remaining in the subsurface from historical releases of diesel and oil.

Gray silty sand and silt and dark-brown to black peat mixed with wood debris are encountered beneath the shallow fill and extend up to 20 to 27 feet bgs. The transitional beds are dense, moist, brown, medium grained sand with various amounts of silt and discontinuous stiff, brown, organic-rich, clayey silt with some fine-grained sand. The transitional beds were mapped at the land surface to the east of the Site (WSP, 2023).

Shallow unconfined groundwater occurs at the Site from near-surface to depths of 12 feet bgs. Shallower groundwater on the east side of the Site near the overpass for Terminal Avenue and deeper groundwater near the current shoreline. Groundwater is frequently observed to discharge from the base of the overpass and to the surface at the northeast corner of the Site on the former KC property near former Everett Avenue (WSP, 2023).

Contour maps based on groundwater elevations measured during semiannual monitoring events reveal that groundwater beneath the Property and immediate area flows generally toward the west and northwest. Groundwater levels vary seasonally by approximately 2 to 3 feet. Groundwater wells located closer to the current shoreline (west of the Property) show larger response to tidal variations as compared to the much smaller responses in wells located at the Property. Wells MW-A1, MW-A2, and MW-A3 (located west of the Property) have showed the greatest tidal response of 1.1 feet, compared to an 8- to 9-foot tidal range in surface water of Port Gardner Bay measured at the Everett Pier.



GEOTECHNICAL INVESTIGATION – MAY 2023

3.3 SURFACE WATER HYDROLOGY

Due to the pavement across the Property and surrounding area, surface water drainage is controlled largely by surface topography and engineered drainage structures. Surface water runoff at the Property follows existing topography. Stormwater generally flows to the west and northwest, following the surface slope, toward catch basins located on the Property and on Federal Avenue directly west of the Property.

According to WSP, storm sewers serving the Property and vicinity discharge to Port Gardner Bay via the storm sewer discharge located near the northwest corner of the Port of Everett property leased by Dunlap Towing. The combined stormwater and sanitary sewer line services the area. Sewage is pumped to and treated at the City of Everett sewage treatment plant except during periods of heavy rainfall, when overflow is routed directly to Port Gardner Bay.

There are four catch basins located on the Property along a north/south-oriented line and all are approximately 70 feet east of the western Property boundary. The catch basins on the Property are connected via underground conveyances (AMEC Earth & Environmental, 2007) and discharge via a lateral that extends toward Federal Avenue.

Some surface water may flow north from the Property toward the former KC property and south from the Property to the City of Everett parcel. Surface water may also flow onto the Property from the easterly-adjacent BNSF property (WSP, 2023).

4.0 GEOTECHNICAL INVESTIGATION – MAY 2023

Stantec's geotechnical investigation is intended to support the shoring design and backfill recommendations for the proposed Project. The investigation consisted of drilling and sampling five soil borings (GB-5 through GB-9) at the Property. **Figure 3** shows the locations of the five geotechnical borings and the approximate location of the proposed sheet pile shoring wall. Stantec contracted with Holt Drilling (Edgewood, Washington) who provided a truck-mounted CME-85 drill rig and who performed the drilling under Stantec's supervision. The CME-85 rig is capable of hollow stem auger and mud rotary drilling methods, both of which were used during this investigation.

Borings GB-5 through GB-9 were drilled and sampled to depths ranging from 46.5 to 51.5 feet bgs. Field work was conducted on May 1 through May 3, 2023. Additional details of the geotechnical investigation are provided below.

4.1 PRE-FIELD AND PRELIMINARY FIELD ACTIVITIES

Prior to field activities, the site-specific health and safety plan (HASP) was updated to include the hollow stem auger and mud rotary geotechnical drilling and sampling work. The HASP identified potential physical, biological, and chemical hazards associated with the planned field activities and established personal protection standards and mandatory safety practices. The HASP included a list of monitoring equipment, protective clothing and equipment, map and directions to the nearest hospital, and a list of emergency



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telephone numbers. The HASP was available onsite during the field activities. Stantec personnel and subcontractors working on the Site were required to review, sign, and comply with the provisions set forth in the HASP.

Prior to drilling, Stantec contacted One Call, a municipal underground utility location service to identify subsurface municipal utilities located in the vicinity of the Property (Tickets #23148495 and 23148496). Additionally, Stantec contracted Advanced Underground Utility Locating (AUUL; a private underground utility location service based in Bellevue, Washington) to clear the proposed soil boring locations; AUUL performed their non-invasive field work on May 1, 2023. During clearance work for GB-6, the first two locations were not able to be cleared so the final location for GB-6 (as shown on **Figure 3**) was the third “step-out” location.

4.2 DRILLING, SOIL SAMPLING, AND LITHOLOGIC LOGGING

4.2.1 Hollow Stem Auger and Mud Rotary Drilling

The five soil borings (51.5-foot-deep borings GB-5 through GB-8 and the 46.5-foot-deep boring GB-9) were drilled and sampled on May 1 through May 3, 2023. Borings GB-5 and GB-6 were located along the west side of the Property; GB-7 was located in the northeast corner of the Property; GB-8 was located along the east side of the Property; and GB-9 was located near the east to south-central along the east side of the Property (**Figure 3**).

Due to heaving sand conditions and as needed, the drilling method switched between hollow stem auger and mud rotary. The boring logs for GB-5 through GB-9 in **Appendix B** indicate the drilling method at each soil boring. Drilling was supervised by a Washington-licensed Stantec field geologist.

4.2.2 Soil Sampling and Lithologic Logging

During drilling, disturbed soil samples were obtained at approximate 5-foot intervals throughout the entire length of each boring using an 18-inch-long, 1.5-inch-inner-diameter (2-inch-outer-diameter), split-spoon sampler driven using a 140-pound hammer free falling a vertical distance of 30 inches. This sampling procedure is a Standard Penetration Test (SPT). The summation of hammer-blows required to drive the sampler the final 12-inches of an 18-inch sample interval is defined as the Standard Penetration Resistance, or N-value. Alternating with SPT was sample collection using a California Modified split-spoon sampler lined with brass rings. All successfully retained soil samples were retained for possible physical testing.

Soils were visually inspected and logged in the field during drilling and described in accordance with the Unified Soil Classification System (USCS; ASTM D 2487). Copies of the GB-5 through GB-9 boring logs are provided in **Appendix B**.

Following all drilling and soil sampling, each boring was completely filled with bentonite chips (hydrated in place) and sealed at the surface with concrete (dyed gray) to match the surrounding pavement. For borings GB-7 and GB-8 drilled in the soil/gravel along the east side of the Property, soil/gravel was placed on top of the surficial concrete seal.



GEOTECHNICAL INVESTIGATION – MAY 2023

Soil cuttings, drilling mud, and decontamination water generated during drilling and equipment decontamination activities were placed in labeled 55-gallon Department of Transportation-approved drums and temporarily stored along the east side of the Property near boring GB-8.



SOIL AND GROUNDWATER CONDITIONS – MAY 2023

4.3 GEOTECHNICAL LABORATORY TESTING

The following laboratory tests were performed in general accordance with ASTM procedures:

Table 1. Summary of Laboratory Tests

Type of Test	ASTM Designation	Number Performed
Sieve Analysis	ASTM D422	5
Direct Shear	ASTM D3080	4

Six soil samples (GB-5-25'; GB-6-21'; GB-7-31'; GB-8-20'; GB-8-30'; and GB-9-26') were transported to JD & S Testing (JD & S; a construction-materials testing laboratory in Grantsville, Utah) for analysis of one or both of the following physical tests: sieve analysis/grain size using ASTM D422, and direct shear using ASTM D3080. Copies of JD & S' laboratory test results are provided in **Appendix C**.

5.0 SOIL AND GROUNDWATER CONDITIONS – MAY 2023

5.1 SITE SOIL CONDITIONS

Details of the soil conditions encountered during this field program are presented on the GB-5 through GB-9 boring logs in **Appendix B**. Generalized descriptions of the subsurface conditions encountered at the borings are provided below and are consistent with the lithologic data from previous Site investigations: artificial fill, marsh deposits, and the transitional beds (Qtb). Not unexpectedly, heavy-range petroleum hydrocarbons (evidenced by dark staining, slightly to very strong petroleum hydrocarbon odors [PHCO], and/or sheen) were observed in the approximate upper 20 feet of each boring.

Artificial fill (the upper-most unit encountered) beneath the Property ranged in thickness from approximately 8 to 18 feet bgs. Artificial fill consisted of very loose to loose, slightly moist to saturated, gravel-sand-sandy silt soil mixed with wood and metal debris that contained strong to very strong levels of PHCO.

The marsh deposits consisted of loose to medium-dense/medium stiff to stiff, wet to saturated, poorly-graded sand (SP), silty sand (SM), and/or silt (ML) with varying amounts of natural organics (peat). Odors were periodically present: low levels of PHCO and/or naturally-decaying/bog-like odors.

The transitional beds consisted of dense/very stiff, wet to saturated, fine to medium gravel (GW), poorly-graded sand (SP), well-graded sand (SW), clayey sand (SC), and silt (ML). A distinctive, approximate 5-foot-thick, marker bed of dark grey/olive grey/dark olive grey silt was encountered at depths of approximately 31 to 36 feet bgs in each of the five soil borings.

5.2 SITE GROUNDWATER CONDITIONS

Groundwater was encountered at depths of approximately 5 to 10 feet bgs in each of the five borings, consistent with prior Site drilling and with static groundwater levels in the Site monitoring wells. Not



GENERAL DISCUSSION AND RECOMMENDATIONS

unexpectedly, shallow groundwater beneath the Site was found to be impacted with petroleum hydrocarbons (evidenced by slight to very strong PHCO levels and/or sheen).

6.0 GENERAL DISCUSSION AND RECOMMENDATIONS

Geotechnical borings GB-5 through GB-9 were drilled and sampled to depths ranging from 46.5 to 51.5 feet bgs. Subsurface conditions encountered at the borings consisted of artificial fill, marsh deposits, and the transitional beds (Qtb).

Artificial fill (the upper-most unit encountered) beneath the Property ranged in thickness from approximately 8 to 18 feet bgs. Artificial fill consisted of very loose to loose, slightly moist to saturated, gravel-sand-sandy silt soil mixed with wood and metal debris that contained strong to very strong levels of PHCO.

The marsh deposits consisted of loose to medium-dense/medium stiff to stiff, wet to saturated, poorly-graded sand (SP), silty sand (SM), and/or silt (ML) with varying amounts of natural organics (peat). Odors were periodically present: low levels of PHCO and/or naturally-decaying/bog-like odors.

The transitional beds consisted of dense/very stiff, wet to saturated, fine to medium gravel (GW), poorly-graded sand (SP), well-graded sand (SW), clayey sand (SC), and silt (ML). A distinctive, approximate 5-foot-thick, marker bed of dark grey/olive grey/dark olive grey silt was encountered at depths of approximately 31 to 36 feet bgs in each of the five soil borings.

As noted in Section 1 and as shown on **Figure 3**, the remedial excavation includes installation of approximately 600 linear feet of shoring, excavation and removal of approximately 17,500 cubic yards of petroleum impacted soil, backfilling the remedial excavation, and restoration of the ground surface.

Areas where excavations to a depth of 20-feet will occur will be stabilized prior to the remedial excavation by advancing direct push borings on a roughly 20-feet by 20-feet grid and injecting Portland cement between a depth of 15 and 20 feet below the ground surface. Shoring installation and remedial excavation activities will occur upon completion of this soil stabilization effort.

6.1 TEMPORARY EXCAVATIONS

Based on our understanding of the project, we anticipate that the remedial excavation work will include removal of petroleum impacted soil to a maximum depth of approximately 20 feet bgs.

The existing native soils can be considered Type C for excavation in accordance with Occupational Safety and Health Administration (OSHA) requirements. Temporary excavations should be shored or excavated with a slope not steeper than 1.5:1 (horizontal to vertical) in accordance with OSHA requirements.

All temporary excavations should be in accordance with the Washington Administrative Code (WAC) 296-155 Construction Work, *Part N – Excavation, Trenching, and Shoring* (296-155-650, -655, -657, and -664), Snohomish County requirements, and/or City of Everett requirements. Temporary slopes should be visually inspected daily during construction activities and the inspections should be documented in daily reports.



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The contractor is responsible for maintaining the stability of the temporary cut slopes and reducing slope erosion during construction.

Any near-surface temporary cut slopes should be covered with visqueen to help reduce erosion during wet weather with berms placed around the top of the excavation to minimize surface water runoff onto the excavation slopes, and the slopes should be closely monitored. Soil should not be stockpiled, materials should not be stored, and equipment should not be operated within 10 feet of the top of any temporary cut slope.

The project geotechnical engineer should be notified if other surcharge loads are anticipated so that lateral load criteria can be developed for the specific situation. If temporary slopes are to be maintained during the rainy season, berms are recommended near the tops of slopes to prevent runoff water from entering the excavation and eroding the slope faces.

The Contractor (Stantec's selected prime contractor for the Project) and/or the project structural engineer are responsible for developing and designing temporary shoring systems, as needed.

6.2 TEMPORARY CANTILEVER SHORING

Temporary excavations to depths up to approximately 20 feet bgs are anticipated. Where sheet pile shoring is used in lieu of sloping the temporary excavation sidewalls, lateral forces for structural design of shoring system for resistance of lateral forces may be based upon the following:

Active: $40D_1$ pounds per square foot per foot (psf/ft) (to a depth of D_1 at the phreatic surface behind the wall),
 $80H - 50D_1$ psf/ft (includes hydrostatic forces below the water table),

where D_1 is the depth to groundwater from the surface and H is the total length of the sheet pile below the ground surface behind the UST cavity.

Passive: $60D_3$ psf/ft (hydrostatic pressure above the bottom of the excavation),
 $260D_2 + 60D_3$ psf/ft (earth and hydrostatic pressure below bottom of excavation),

where D_2 is the embedment depth of the shoring from the bottom of the excavation to the bottom of the shoring, and D_3 is the depth of water above the bottom of the excavation (note: if water is removed to bottom of excavation, $D_3 = 0$) as shown on Figure 4. These equivalent fluid pressures should be applied as a triangular pressure distribution behind the wall and assume level backfill behind and in front of the shoring. The earth pressures indicated above do not include a safety factor; therefore, the shoring design should include an appropriate safety factor for the overall performance of the system.

If water level is pumped and removed below the bottom of the planned excavation bottom, these pressures should be reevaluated.

6.3 BRACED SHORING SYSTEM

For braced shoring above the groundwater level, a uniform rectangular pressure distribution should be used from top to bottom of the shoring equivalent to the following:



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Bracing: 25H psf/ft

where H is the depth of the excavation, in feet.

These pressures are based on level ground conditions in front and behind the wall with no surcharge loads within 10 feet of the excavation. The earth pressures indicated above do not include a safety factor; therefore, the shoring design should include an appropriate safety factor for the overall performance of the system.

6.4 GEOTECHNICAL FILTER FABRIC

Subsequent to excavation activities outlined in Section 6.5 and prior to placement backfill as described in Section 6.5.2, the Contractor shall furnish and install geotechnical filter fabric that consists of a woven material composed of a strong, rot-proof polymeric yarn or fiber orientated into a stable network that retains its relative structure during handling, placement, and long-term service. It shall have complete resistance to deterioration from ambient temperatures, acid, and alkaline conditions, and shall be indestructible to micro-organisms and insects. The material shall be resistant to short-term (until placement) deterioration by ultraviolet light or protected until placement as recommended by the manufacturer such that no deterioration occurs. The filter fabric shall conform to the following minimum average roll values specified on the following table:

Table 2. Geotextile Minimum Average Roll Values

Property	Specification	Test Method
U. S. Standard Sieve	No. 30 (max)	ASTM D 4751
Permittivity	0.02 sec ⁻¹ (min)	ASTM D 4491
Grab Tensile Strength	250 pounds (min)	ASTM D 4632
Grab Tensile Elongation	<50%	ASTM D 4632
Trapezoid Tear Strength	80 pounds (min)	ASTM D 4533
Puncture Strength	495 pounds (min)	ASTM D 6241

The Contractor shall submit its proposed geotextile filter fabric for review and approval by the Stantec Project Manager (Project Manager) prior to delivery of the material to the Project site. One geotextile material conforming to these specifications is Mirafi FW300. Upon delivery to the Project site, filter fabric rolls shall be stored in a manner that protects them from the elements, specifically UV radiation.

As indicated on the construction drawings (hereinafter referred to as the Plans), the filter fabric shall be placed along the sidewalls of the excavation and over the surface of the backfill placed below the water table. The filter fabric shall be joined by either overlapping or sewing using a double-seam-sewn joint. Details and procedures for forming double-seam joints shall be subject to the Project Manager's approval. Overlapping joints shall have a minimum overlap of at least one (1) foot. Other aspects of the filter fabric installation shall be in accordance with Section 9-33.1 of the Washington State Department of



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Transportation's (WSDOT) *Standard Specifications for Road, Bridge, and Municipal Construction 2022* (Standard Specifications; WSDOT, 2022). The fabric placement shall be inspected and approved by the Project Manager prior to placement of backfill.

6.5 EXCAVATION RESTORATION – BACKFILL

The Contractor shall furnish and place backfill as directed in the following paragraphs, with Contractor responsible to check and maintain lines and grades for backfill operations. The Contractor shall source and use only clean backfill material. Contractor shall submit a supplier's certificate documenting compliance of each type of backfill material for approval by the Project Manager prior to importing material to the Site.

6.5.1 Backfill Below the Water Table

Backfill shall meet the graduation specification of Section 9-03.12(4) of the Standard Specifications (WSDOT, 2022), AASHTO (American Association of State Highway and Transportation Officials) No. 57, or a comparable material approved by the Project Manager. Contractor shall submit a supplier's certificate documenting compliance of the backfill material for approval by the Project Manager prior to importing material to the Site. Contractor shall place the backfill in conformance with the lines, grades and dimensions shown on the Plans. The backfill shall be deposited and spread evenly and placed in loose lifts not to exceed 12 inches in thickness. At the water table surface the backfill shall be compacted by tamping, and additional backfill deposited until tamping no longer pushes backfill below the water table surface.

6.5.2 Backfill Above the Water Table (Subbase)

The subbase backfill shall meet the graduation specification of Section 9-03.18 of the Standard Specifications for Foundation Material Class C (WSDOT, 2022). Contractor shall submit a supplier's certificate documenting compliance of the backfill material for approval by the Project Manager prior to importing material to the Site. Contractor shall place the backfill in conformance with the lines, grades and dimensions shown on the Plans (i.e., from the water table surface to minus 24 inches below surface grade), and in accordance with the applicable provisions of the Standard Specifications (WSDOT, 2022), except as specified below. The subbase backfill shall be placed in uniform lifts not exceeding twelve (12) inches in uncompacted thickness, deposited and spread without segregation of aggregate, with each layer free from pockets of coarse or fine materials. Any such pockets shall be reworked to give a uniform layer. Each lift of subbase backfill shall be compacted to a minimum density of 92 percent of the maximum dry density as determined by WSDOT Standard Operating Procedure 615.

Prior to placement of any subbase backfill for the Project, Contractor shall submit the laboratory test results for the maximum dry density of a proctor sample according to WSDOT T606 for approval by the Project Manager. During placement of the subbase backfill, testing for minimum density shall be performed at a minimum of one test per 200 square feet of placed material, with a minimum of four tests per lift per excavation location. Any area tested to not meet the minimum density requirement shall be reworked until testing indicates such area meets the requirement.



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6.5.3 Aggregate Base

The aggregate base shall conform to the requirements of Section 9-03.10 of the Standard Specifications (WSDOT, 2022). Contractor shall submit a supplier's certificate documenting compliance of the aggregate material for approval by the Project Manager prior to importing material to the Site. Contractor shall place the backfill in conformance with the lines, grades and dimensions shown on the Plans (i.e., from minus 24 to minus 6 inches below surface grade), and in accordance with the applicable provisions of the Standard Specifications, except as specified below. The aggregate base shall be placed in uniform lifts not exceeding nine (9) inches in uncompacted thickness, deposited and spread without segregation of aggregate, with each layer free from pockets of coarse or fine materials. Any such pockets shall be reworked to give a uniform layer. Each lift of aggregate base shall be compacted to a minimum density of 95 percent of the maximum dry density as determined by WSDOT SOP 615.

Prior to placement of any aggregate base for the project, Contractor shall submit the laboratory test results for the maximum dry density of a proctor sample according to WSDOT T606 for approval by the Project Manager. During placement of the aggregate base, testing for minimum density shall be performed at a minimum of one test per 200 square feet of placed material, with a minimum of four tests per lift per excavation location. Any area tested to not meet the minimum density requirement shall be reworked until testing indicates such area meets the requirement.

6.6 SURFACE RESTORATION – ASPHALT CONCRETE (AC) PAVING

Contractor shall furnish, place, and compact hot mix asphalt concrete paving (HMA) over the aggregate base as shown on the Plans (i.e., from minus 6 inches to surface grade). The HMA aggregate, binder, and other materials shall meet the requirements of Sections 5-04, 9-02, and 9-03 of the Standard Specifications for ¾-inch Class HMA (WSDOT, 2022).

A tack coat shall be applied to vertical and horizontal surfaces against which asphalt concrete (AC) will be placed as required by Section 5-04.3(4) of the Standard Specifications (WSDOT, 2022). Beneath the overlay or between lifts the tack coat shall be applied at a rate of 0.05 to 0.10 gallon of tack coat emulsion per square yard.

The AC shall be placed in lifts not to exceed four (4) inches and not less than two (2) inches thick (compacted thickness), except leveling course, which may be thinner. Leveling courses covering large areas less than two (2) inches thick will not be allowed. Each lift shall be uniform in thickness.

Steps shall be taken to ensure that a clean, dirt-free surface exists between lifts and beneath overlays. Areas to receive an asphalt overlay shall be cleaned of all dust, dirt, and other grinding debris by brooming or blowing with compressed air as necessary immediately before tack coat is applied. At locations where the dirt cannot be washed or broomed off the surface, a tack coat shall be broomed into the remaining particles. The condition of the surface must be approved by the Project Manager prior to paving. If the surface between lifts becomes dirty, it shall be tacked even if both lifts are placed the same day. Lifts placed more than eight (8) hours apart shall be tacked.



GENERAL DISCUSSION AND RECOMMENDATIONS

Longitudinal and transverse joints in asphalt concrete shall be staggered between lifts. The edge of the joint of the lower lift shall be at least one (1) foot from the edge of the joint of the overlying lift. Longitudinal and transverse joints shall be trimmed vertically if the exposed joint surface is not dense and uniform and, in the opinion of the Project Manager, is in such condition that the quality of the completed joint will be affected. Joints older than three (3) hours shall be cut back. Vertical surface joints shall be dense, uniform, and well bonded. In the formation of joints, provisions shall be made for proper bonding with the adjacent lift for the entire depth of the lift. A tack coat shall be applied to such joints and the fresh mixture raked against the joint and thoroughly tamped and rolled. Rolled or rounded edges are not acceptable as vertical surfaces for joints.

Each lift of AC pavement shall be tested for density for a minimum average of 92 percent of the theoretical maximum density. Testing shall be performed at two locations chosen by the Project Manager within each lift. The density tests shall be performed by means of a nuclear device in accordance with the Sections 5-04.3(10) and 5-04.3(10)A of the Standard Specifications (WSDOT, 2022). The results of each test shall be immediately available to the Contractor. If an individual test result is below 90 percent of the maximum theoretical density, the Contractor shall further compact that area represented by the test. After further compaction, a new density test shall be run at the original location and one other location within the recompacted area. The average of the two tests shall be included in the mean density for the section. The original test shall not be included in the mean. AC that fails to meet minimum density requirements shall be removed and replaced at the direction of the Project Manager.

The finished AC surface shall conform to the smoothness tolerance stipulated in Section 5-04.3(13) of the Standard Specifications (WSDOT, 2022), except the surface shall not have depressions greater than $\frac{1}{8}$ inch when tested with a 12-foot straightedge laid transverse to, or in the direction of paving, and no portion of the pavement shall retain ponded water. Edges of leveling coverages shall be feathered. The larger aggregates shall be raked and removed, leaving a dense well graded edge. In addition, Contractor shall perform flood testing to demonstrate positive drainage to the satisfaction of the Project Manager.

6.7 YIELDING SUBGRADE CONDITIONS

The soil encountered at the bottom of the remedial grading excavations can exhibit “pumping” or yielding if they become saturated in response to periods of significant precipitation, such as during the winter rainy season. If this occurs, corrective measures should be performed with oversight from the Geotechnical Engineer.

In order to help stabilize the yielding subgrade soils within the bottom of the removal areas, the contractor can consider the placement of stabilization fabric or geo-grid over the yielding areas, depending on the relative severity of the yielding.

Mirafi 600X (or approved equivalent) stabilization fabric may be used for areas with low to moderate yielding conditions. Geo-grid such as Tensar TX-5 may be used for areas with moderate to severe yielding conditions. Uniform sized, $\frac{3}{4}$ - to 2-inch crushed rock should be placed over the stabilization fabric or geo-grid. A 6- to 12-inch thick section of crushed rock will typically be necessary to stabilize yielding ground.



GENERAL DISCUSSION AND RECOMMENDATIONS

If significant voids are present in the crushed gravel, a filter fabric should be placed over the crushed gravel to prevent migration of fines into the gravel and thus potential settlement of the overlying fill. Fill soils, which should be placed and compacted in accordance with the recommendations presented herein, should then be placed over the fabric or geo-grid until design grades are reached. The crushed gravel and stabilization fabric or geo-grid should extend at least 5 feet laterally beyond the limits of the yielding areas.

6.8 DEWATERING

Groundwater was encountered during the geotechnical investigation at depths ranging from approximately 5 to 10 feet bgs. Dewatering may be required for prior to or during remedial excavation activities. Dewatering may be facilitated with the use of well points. Lowering the groundwater can cause increased effective stresses and consolidation. Compressible soils may be present beneath the streets and private properties beyond the Project boundaries. Conventional dewatering would require that perimeter wells lower the groundwater to a level at least several feet below the bottom of the planned excavations to achieve a stable surface for construction and excavations. This may cause increased effective stress, and subsequent settlement of soils in the surrounding area. Consideration should be given to the potential impacts the dewatering system may have on the surrounding properties.

6.9 EXPANSIVE SOIL

The near-surface soils (approximately upper 10 feet) have a low expansion potential. Our soil classifications and laboratory test results show that the near surface (upper 10 feet) samples tested are granular with low-plasticity fines. Accordingly, mitigation for expansive soils is not considered necessary at this Site. The grading and foundation recommendations presented in this report reflect a low expansion potential.

6.10 IMPORTED MATERIAL

Imported materials, if used for fill, should be predominately granular, contain no rocks or lumps greater than 3 inches in maximum dimension, and have an Expansion Index less than 20, and a Plasticity Index less than 15. Imported materials should be reviewed and approved by the Geotechnical Engineer before being brought to the Site.

6.11 SITE EXCAVATION CHARACTERISTICS

During the recent geotechnical investigation, the soil boreholes were drilled using a truck-mounted, hollow stem auger drill rig. As the drilling was completed with moderate effort, conventional earth moving equipment should be capable of performing the excavations required for the remedial excavation.

6.12 OVERSIZED MATERIAL

Excavations may generate oversized material. Oversized material is defined as rocks or cemented clasts greater than 3 inches in largest dimension. Oversized material should be broken down to no greater than 3 inches in largest dimension for use in fill or be removed from the Site.



CLOSURE

7.0 CLOSURE

This report was prepared for the exclusive use of ExxonMobil, ADC, and their appointed representatives. Any use of this report or the material contained herein by third parties, or for other than the intended purpose, should first be approved by Stantec. The statements within this report are based on assumed continuity of soils with those of our test holes.

The purpose of the soil investigation was to evaluate Site subsurface conditions prior to remedial excavation activities.



REFERENCES

8.0 REFERENCES

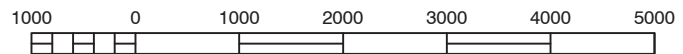
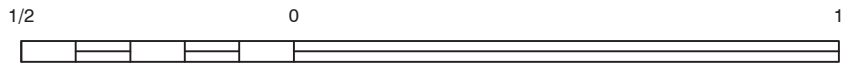
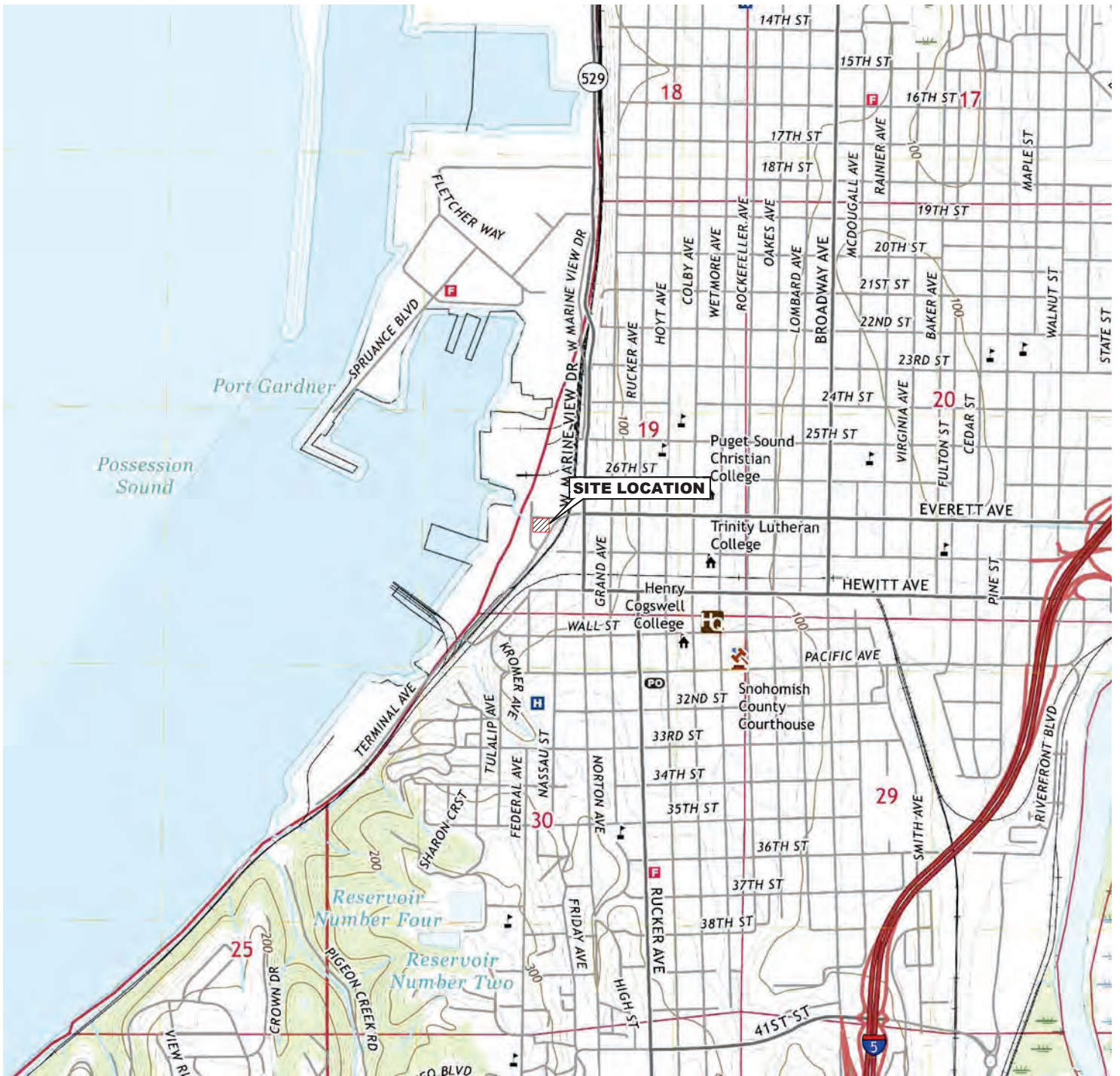
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FIGURES

FIGURES





REFERENCE: USGS 7.5 MINUTE QUADRANGLE, EVERETT, WASHINGTON



1687 114TH AVENUE SE, SUITE 100
 BELLEVUE, WASHINGTON
 PHONE: (425) 289-7300 FAX: (425) 869-1190

FOR:
 EXXONMOBIL ADC
 2717/2731 FEDERAL AVENUE
 EVERETT, WASHINGTON 98201

SITE LOCATION MAP

FIGURE:

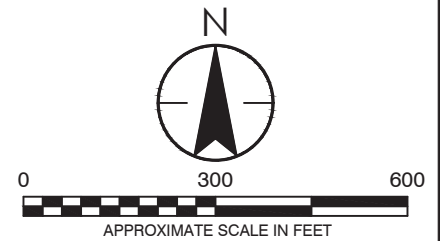
1

JOB NUMBER: 203722923	DRAWN BY: CRJ	CHECKED BY: CS	APPROVED BY: PF	DATE: JUNE 2023
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LEGEND

— — — — — SUBJECT PROPERTY LINE BOUNDARY



1687 114TH AVENUE SE, SUITE 100
 BELLEVUE, WASHINGTON
 PHONE: (425) 289-7300 FAX: (425) 869-1190

FOR:
 EXXONMOBIL ADC
 2717/2731 FEDERAL AVENUE
 EVERETT, WASHINGTON 98201

SITE VICINITY MAP

FIGURE:

2

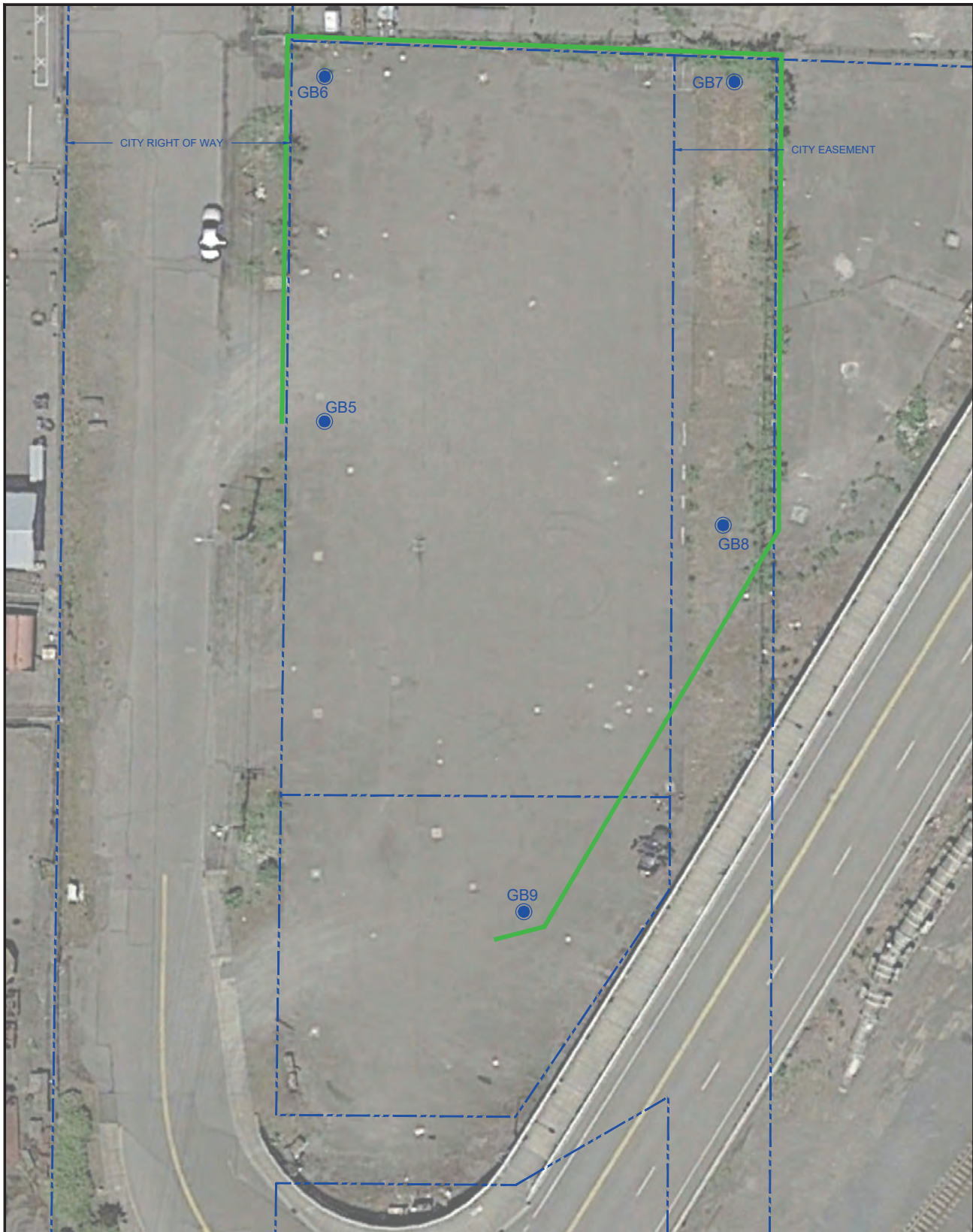
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 203722923

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CHECKED BY:
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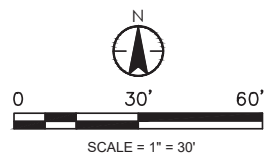
APPROVED BY:
 PF


DATE:
 JUNE 2023



LEGEND

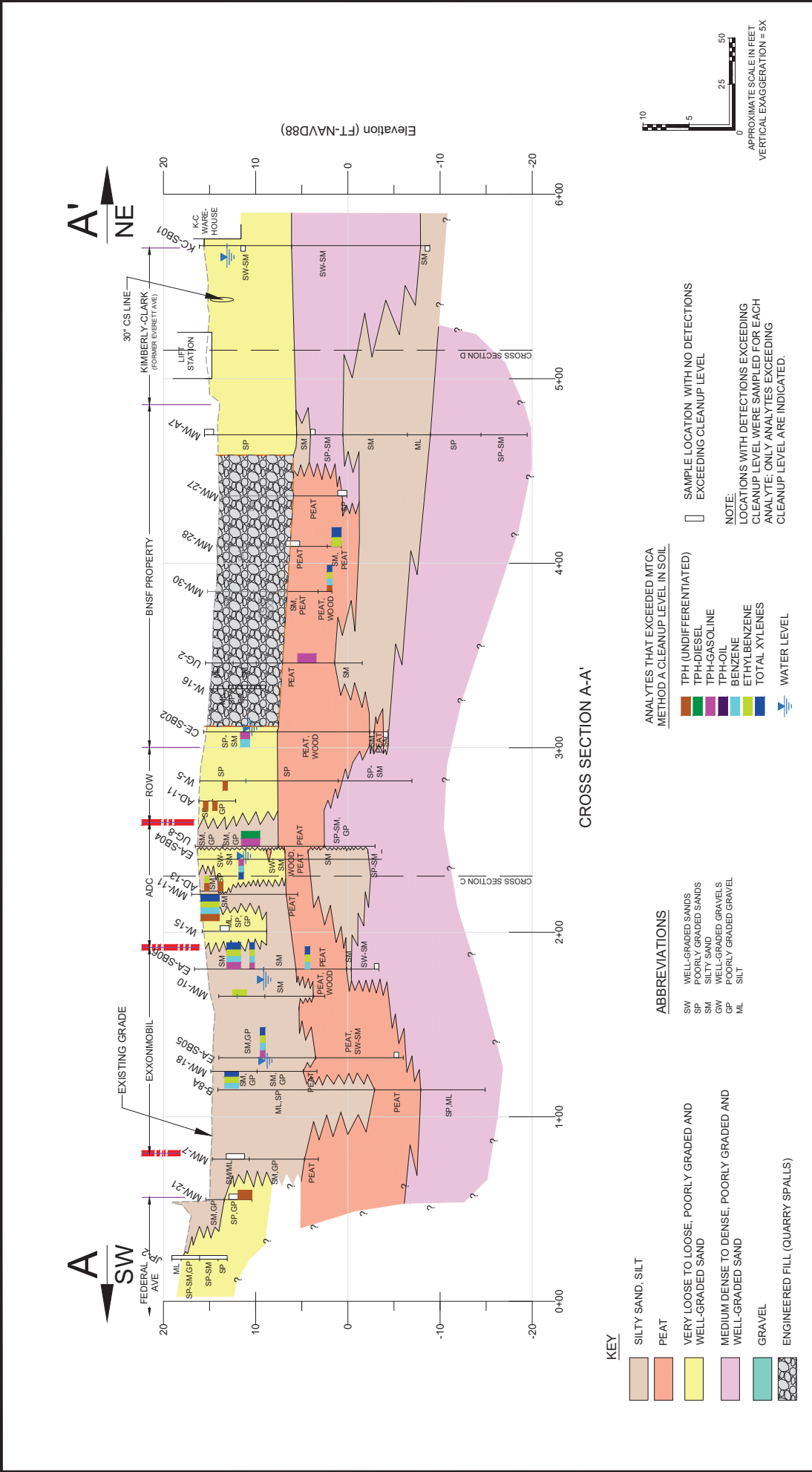
- - - APPROXIMATE PARCEL BOUNDARIES
- GEOTECHNICAL SOIL BORING
- PROPOSED SHORING WALL



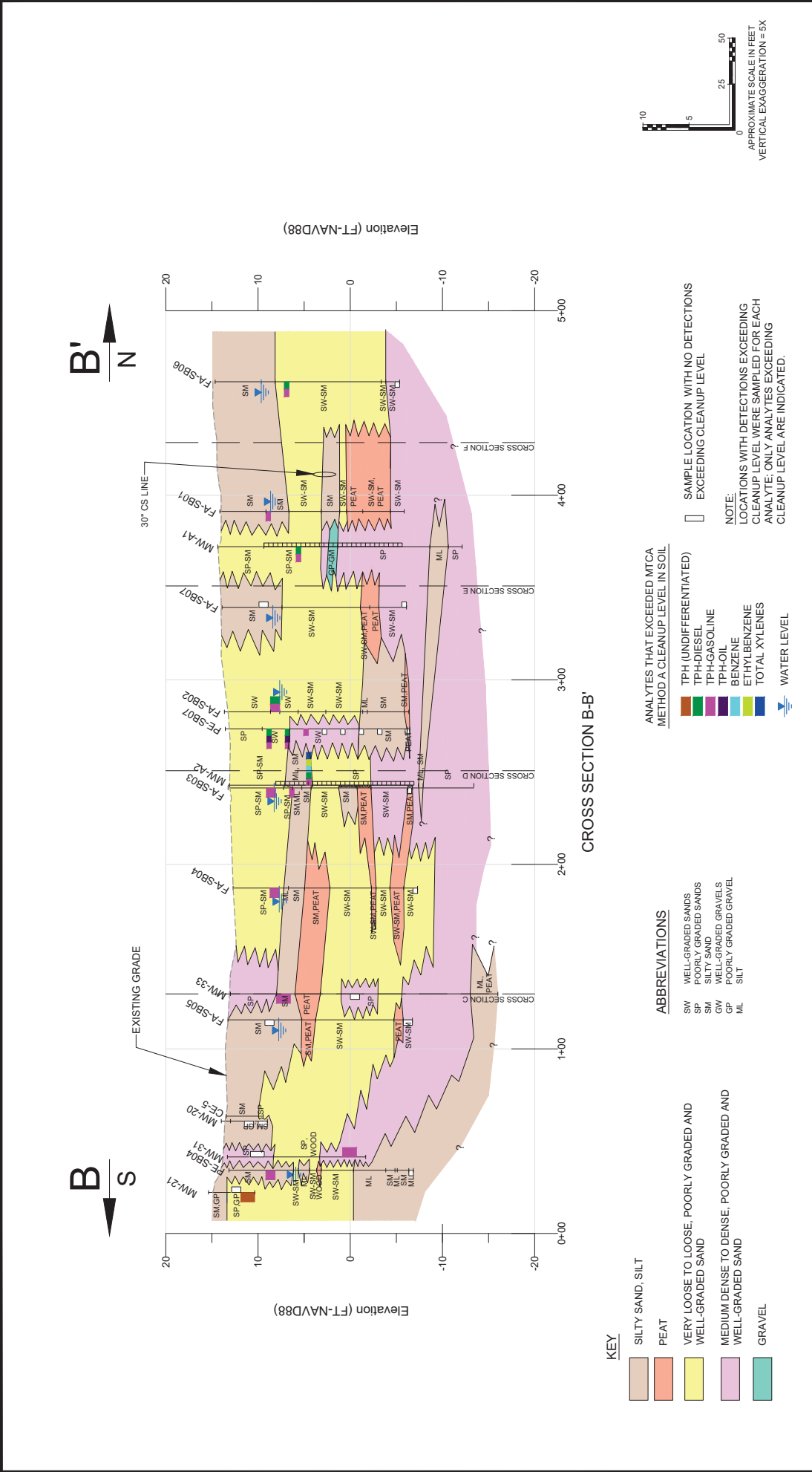
 1687 114TH AVENUE SE, SUITE 100 BELLEVUE, WASHINGTON PHONE: (425) 289-7300 FAX: (425) 869-1190	FOR: EXXONMOBIL ADC 2717/2731 FEDERAL AVENUE EVERETT, WASHINGTON 98201		SITE PLAN WITH SOIL BORING LOCATIONS		FIGURE: 3
	JOB NUMBER: 203722923	DRAWN BY: CRJ	CHECKED BY: CS	APPROVED BY: PF	DATE: JUNE 2023

APPENDIX A

Pre-August 2019 Geologic Cross-Sections (by Wood/WSP)



wood. AMERICAN DISTRIBUTING CO. Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101	CLIENT:	EXXONMOBIL AMERICAN DISTRIBUTING CO.	PROJECT:	EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728	DATE: SEPTEMBER, 2018
	DWN BY:	APS	CHKD BY:	LV	PROJECT NO: 6103180009
SCALE:	WASP	DATUM:	NAD 83 N FT	TITLE:	REVISION: FIGURE NO.:
AS SHOWN	CROSS SECTION A-A'	CROSS SECTION A-A'	CROSS SECTION A-A'	CROSS SECTION A-A'	FIGURE NO.: 2-8



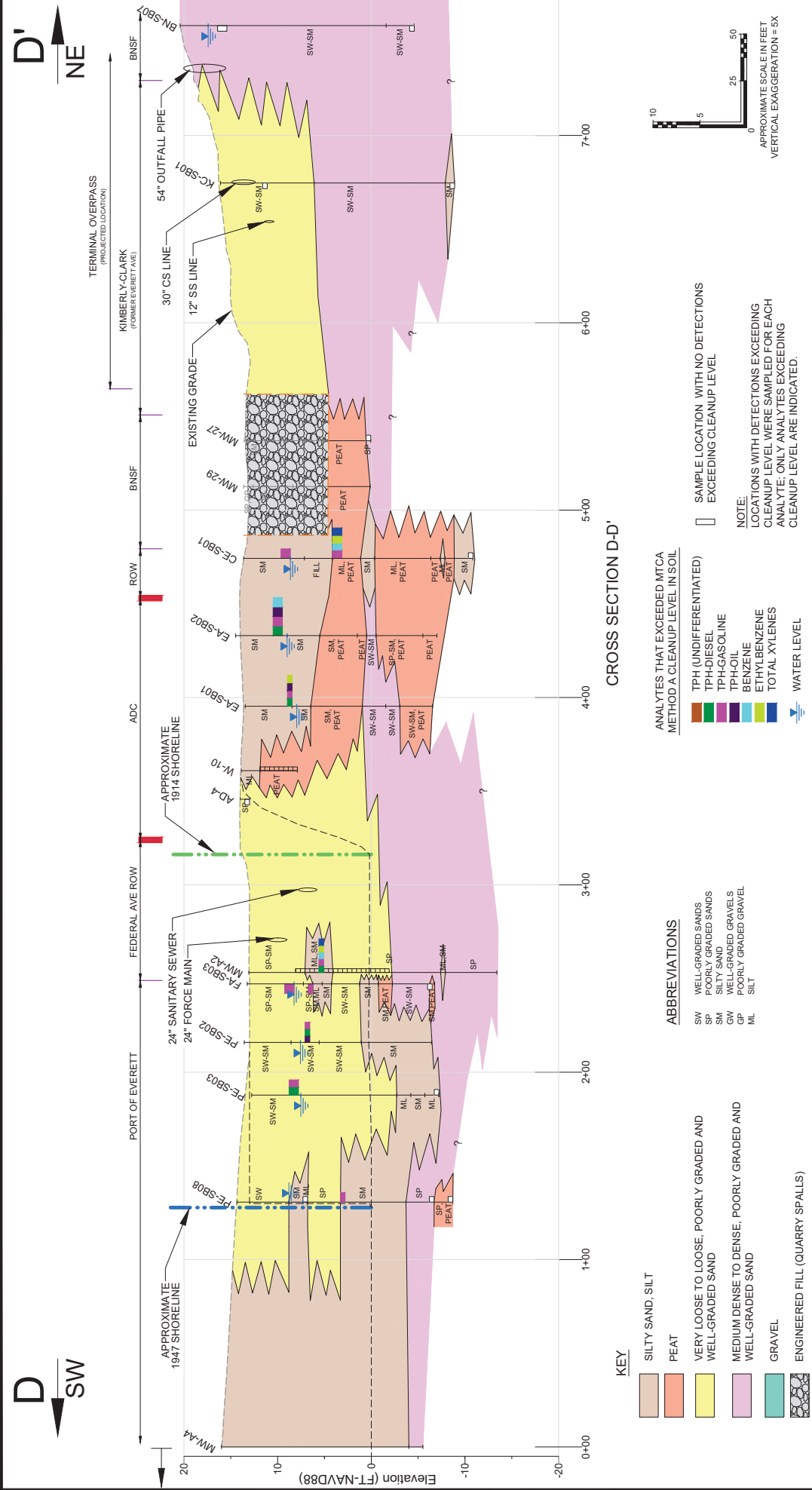
- KEY**
- SILTY SAND, SILT
 - PEAT
 - VERY LOOSE TO LOOSE, POORLY GRADED AND WELL-GRADED SAND
 - MEDIUM DENSE TO DENSE, POORLY GRADED AND WELL-GRADED SAND
 - GRAVEL

- ABBREVIATIONS**
- SW WELL-GRADED SANDS
 - SP POORLY GRADED SANDS
 - SM SILTY SAND
 - GW WELL-GRADED GRAVELS
 - GP POORLY GRADED GRAVEL
 - ML SILT

- ANALYTES THAT EXCEEDED MTCA METHOD A CLEANUP LEVEL IN SOIL**
- TPH (UNDIFFERENTIATED)
 - TPH-DIESEL
 - TPH-GASOLINE
 - TPH-OIL
 - BENZENE
 - ETHYL BENZENE
 - TOTAL XYLENES
 - WATER LEVEL

NOTE:
 SAMPLE LOCATION WITH NO DETECTIONS EXCEEDING CLEANUP LEVEL
 LOCATIONS WITH DETECTIONS EXCEEDING CLEANUP LEVEL WERE SAMPLED FOR EACH ANALYTE; ONLY ANALYTES EXCEEDING CLEANUP LEVEL ARE INDICATED.

	wood.	AMERICAN DISTRIBUTING CO. Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101
CLIENT:		PROJECT: EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728
DATE: SEPTEMBER, 2018 PROJECT NO: 6103180009		TITLE: CROSS SECTION B-B'
DWN BY: APS CHK'D BY: LV DATUM: NAD 83 N FT PROJECTION: WASP SCALE: AS SHOWN		REV. NO.: FIGURE NO: 2-9



- KEY**
- SILTY SAND, SILT
 - PEAT
 - VERY LOOSE TO LOOSE, POORLY GRADED AND WELL-GRADED SAND
 - MEDIUM DENSE TO DENSE, POORLY GRADED AND WELL-GRADED SAND
 - GRAVEL
 - ENGINEERED FILL (QUARRY SPALLS)

- ABBREVIATIONS**
- SW WELL-GRADED SANDS
 - SP POORLY GRADED SANDS
 - SM SILTY SAND
 - GW WELL-GRADED GRAVELS
 - GP POORLY GRADED GRAVEL
 - ML SILT

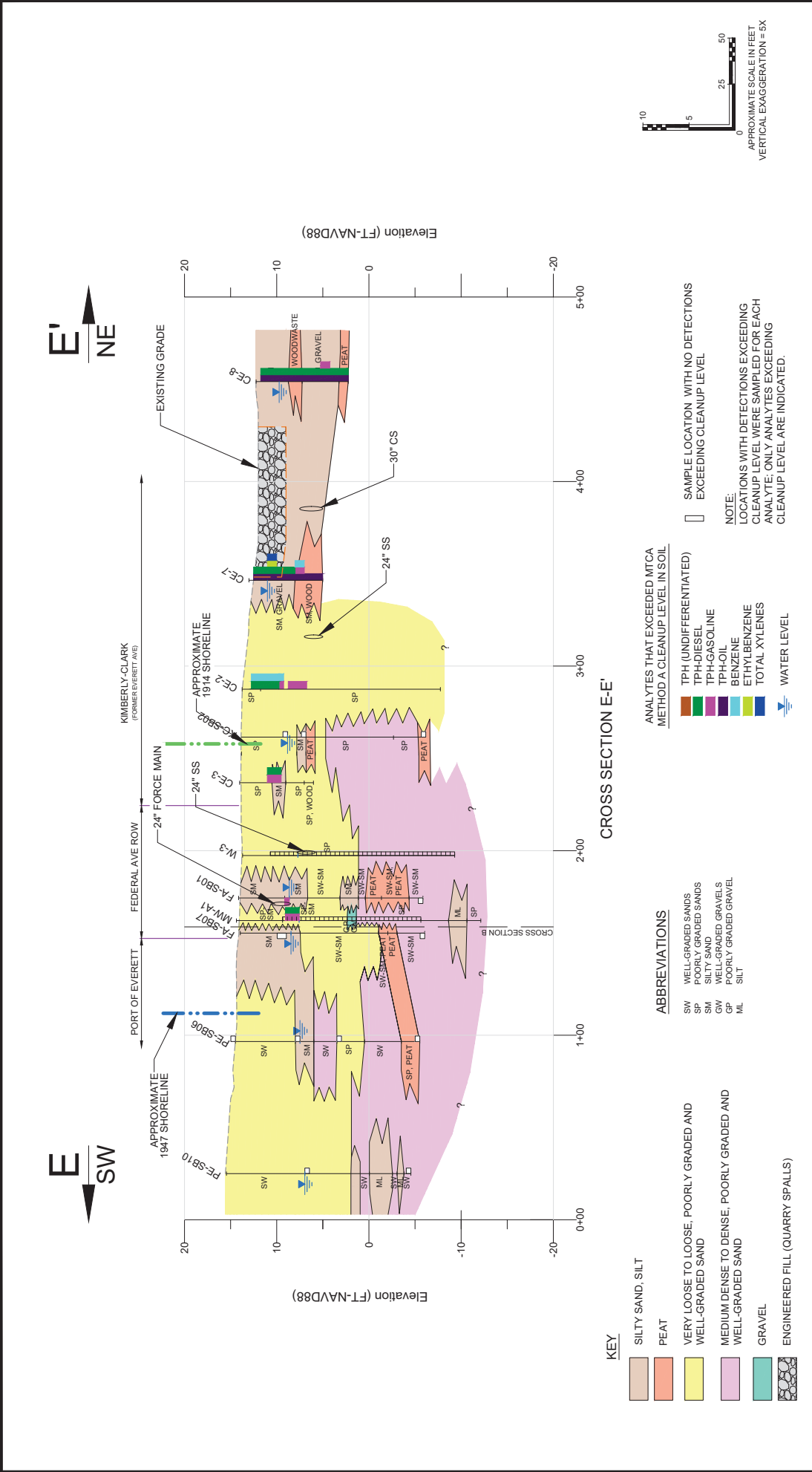
- ANALYTES THAT EXCEEDED MTCA METHOD A CLEANUP LEVEL IN SOIL**
- TPH (UNDIFFERENTIATED)
 - TPH-DIESEL
 - TPH-GASOLINE
 - TPH-OIL
 - BENZENE
 - ETHYL BENZENE
 - TOTAL XYLENES
 - WATER LEVEL

NOTE:
 LOCATIONS WITH NO DETECTIONS EXCEEDING CLEANUP LEVEL WERE SAMPLED FOR EACH ANALYTE. ONLY ANALYTES EXCEEDING CLEANUP LEVEL ARE INDICATED.

NOTE:
 SAMPLE LOCATION WITH NO DETECTIONS EXCEEDING CLEANUP LEVEL

SCALE:
 APPROXIMATE SCALE IN FEET
 VERTICAL EXAGGERATION = 5X

	AMERICAN MOBIL DISTRIBUTING CO. Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101	EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728 CROSS SECTION D-D'
CLIENT:	PROJECT:	DATE:
DWN BY:	AFS	SEPTEMBER, 2018
CHK'D BY:	LV	PROJECT NO:
DATUM:	NAD 83 N FT	6103180009
PROJECTION:	WASP	REV. NO.:
SCALE:	AS SHOWN	FIGURE NO:
		2-11



- KEY**
- SILTY SAND, SILT
 - PEAT
 - VERY LOOSE TO LOOSE, POORLY GRADED SAND
 - WELL-GRADED SAND
 - MEDIUM DENSE TO DENSE, POORLY GRADED AND WELL-GRADED SAND
 - GRAVEL
 - ENGINEERED FILL (QUARRY SPALLS)

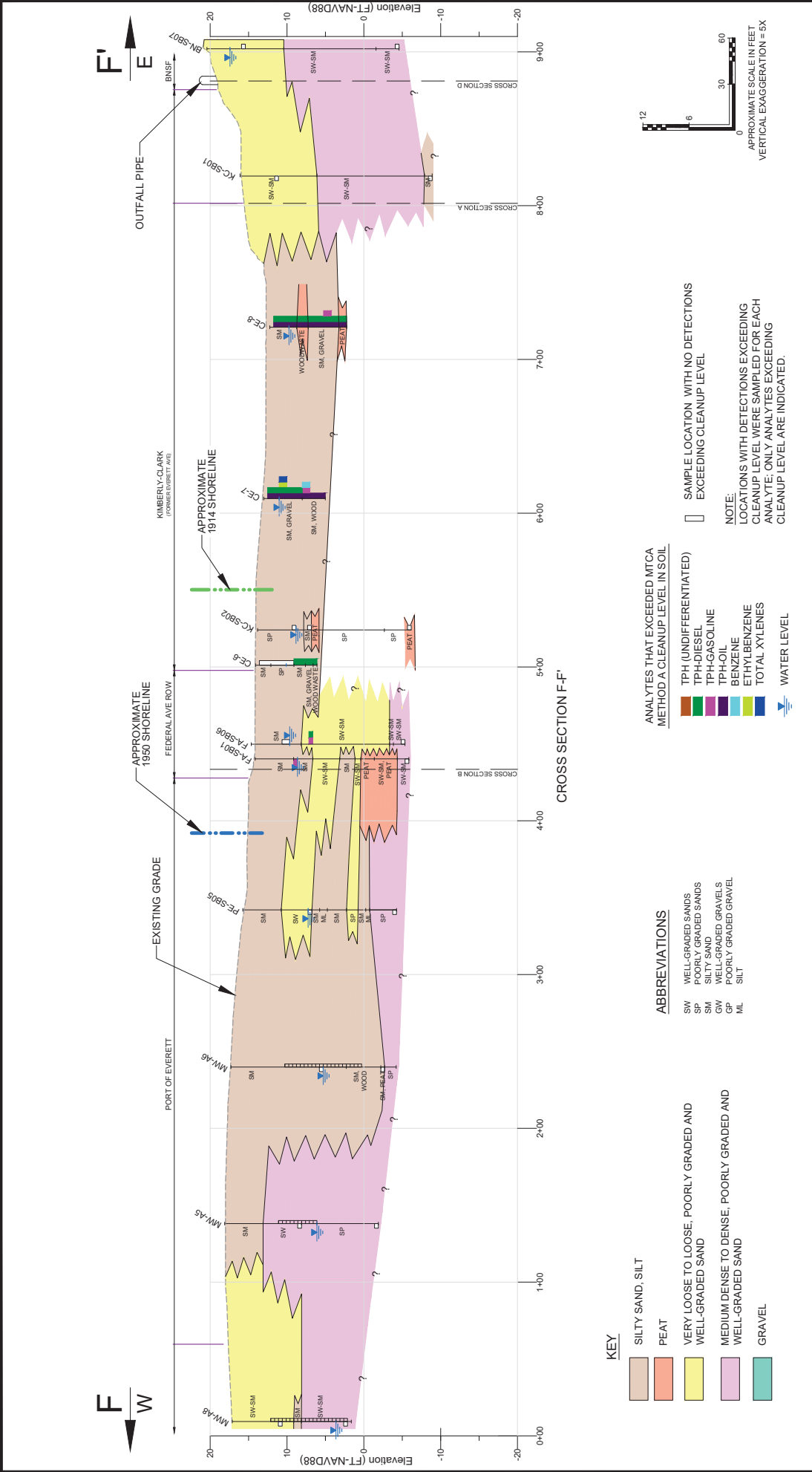
- ABBREVIATIONS**
- SW WELL-GRADED SANDS
 - SP POORLY GRADED SANDS
 - SM SILTY SAND
 - GW WELL-GRADED GRAVELS
 - GP POORLY GRADED GRAVEL
 - ML SILT

- ANALYTES THAT EXCEEDED MTCA METHOD A CLEANUP LEVEL IN SOIL**
- TPH (UNDIFFERENTIATED)
 - TPH-DIESEL
 - TPH-GASOLINE
 - TPH-OIL
 - BENZENE
 - ETHYL BENZENE
 - TOTAL XYLENES
 - WATER LEVEL

- NOTE:**
- LOCATIONS WITH DETECTIONS EXCEEDING CLEANUP LEVEL WERE SAMPLED FOR EACH ANALYTE; ONLY ANALYTES EXCEEDING CLEANUP LEVEL ARE INDICATED.



	CLIENT: AMERICAN MOBIL DISTRIBUTING CO. Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101		PROJECT: EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728	DATE: SEPTEMBER, 2018 PROJECT NO.: 6103180009	FIGURE NO.: 2-12
	CROSS SECTION E-E'		TITLE: CROSS SECTION E-E'		

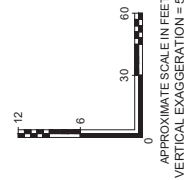


- KEY**
- SILTY SAND, SILT
 - PEAT
 - VERY LOOSE TO LOOSE, POORLY GRADED AND WELL-GRADED SAND
 - MEDIUM DENSE TO DENSE, POORLY GRADED AND WELL-GRADED SAND
 - GRAVEL

- ABBREVIATIONS**
- SW WELL-GRADED SANDS
 - SP POORLY GRADED SANDS
 - SM SILTY SAND
 - GW WELL-GRADED GRAVELS
 - GP POORLY GRADED GRAVEL
 - ML SILT

- ANALYTES THAT EXCEEDED MTCA METHOD A CLEANUP LEVEL IN SOIL**
- TPH (UNDIFFERENTIATED)
 - TPH-DIESEL
 - TPH-GASOLINE
 - TPH-OIL
 - BENZENE
 - ETHYL BENZENE
 - TOTAL XYLENES
 - WATER LEVEL

- SAMPLE LOCATION WITH NO DETECTIONS EXCEEDING CLEANUP LEVEL
- NOTE:**
 LOCATIONS WITH DETECTIONS EXCEEDING CLEANUP LEVEL WERE SAMPLED FOR EACH ANALYTE. ONLY ANALYTES EXCEEDING CLEANUP LEVEL ARE INDICATED.



wood.	AMERICAN DISTRIBUTING CO. Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101	EXXONMOBIL EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728	PROJECT EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728
	CLIENT:	DATE: SEPTEMBER 2018 PROJECT NO: 6103180009 REV. NO.: FIGURE NO: 2-13	TITLE CROSS SECTION F-F'

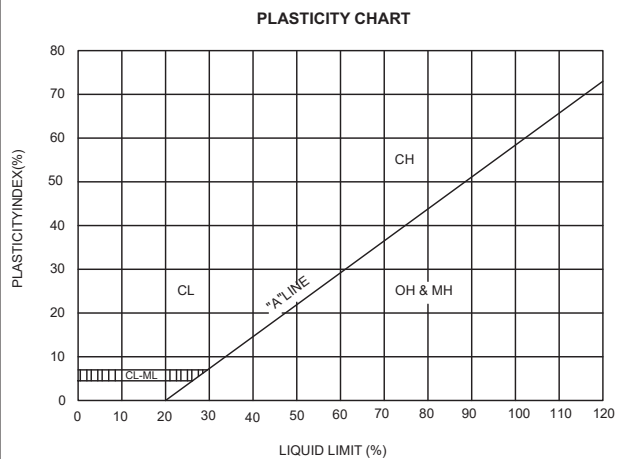
APPENDIX B

Site Boring Logs – Current Geotechnical Investigation

UNIFIED SOIL CLASSIFICATION (ASTM D-2487)

MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES			GROUP SYMBOL	SOIL GROUP NAMES & LEGEND
COARSE-GRAINED SOILS >50% RETAINED ON NO. 200 SIEVE	GRAVELS >50% OF COARSE FRACTION RETAINED ON NO. 4. SIEVE	*CLEAN GRAVELS <5% FINES	$Cu > 4$ AND $1 < Cc < 3$	GW	WELL-GRADED GRAVEL
		*GRAVELS WITH FINES >12% FINES	$Cu > 4$ AND $1 > Cc > 3$	GP	POORLY-GRADED GRAVEL
		FINES CLASSIFY AS ML OR CL		GM	SILTY GRAVEL
		FINES CLASSIFY AS CL OR CH		GC	CLAYEY GRAVEL
	SANDS >50% OF COARSE FRACTION PASSES ON NO. 4. SIEVE	*CLEAN SANDS <5% FINES	$Cu > 6$ AND $1 < Cc < 3$	SW	WELL-GRADED SAND
		*SANDS AND FINES >12% FINES	$Cu > 6$ AND $1 > Cc > 3$	SP	POORLY-GRADED SAND
		FINES CLASSIFY AS ML OR CL		SM	SILTY SAND
		FINES CLASSIFY AS CL OR CH		SC	CLAYEY SAND
FINE-GRAINED SOILS >50% PASSES NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT <50	INORGANIC	$Pl > 7$ AND PLOTS >"A" LINE	CL	LEAN CLAY
		ORGANIC	$Pl > 4$ AND PLOTS <"A" LINE	ML	SILT
	SILTS AND CLAYS LIQUID LIMIT >50	INORGANIC	LL (oven dried)/ LL (not dried) <0.75	OL	ORGANIC CLAY OR SILT
		INORGANIC	PI PLOTS >"A" LINE	CH	FAT CLAY
		ORGANIC	PI PLOTS <"A" LINE	MH	ELASTIC SILT
		ORGANIC	LL (oven dried)/ LL (not dried) <0.75	OH	ORGANIC CLAY OR SILT
HIGHLY ORGANIC SOILS		PRIMARYLY ORGANIC MATTER, DARK IN COLOR, AND ORGANIC ODOR	PT	PEAT	

* Dual symbols required for fines content between 5% and 12%



SAMPLER TYPES

	SPT		Shelby Tube
	Modified California (2.5" I.D.)		No Recovery
	Rock Core		Grab Sample

ADDITIONAL TESTS

COR - CHEMICAL ANALYSIS (CORROSIVITY)	PI - PLASTICITY INDEX
CD - CONSOLIDATED DRAINED TRIAXIAL	EI - EXPANSION INDEX
CN - CONSOLIDATION	TC - CYCLIC TRIAXIAL
CU - CONSOLIDATED UNDRAINED TRIAXIAL	TV - TORVANE SHEAR
DS - DIRECT SHEAR	UC - UNCONFINED COMPRESSION
PP - POCKET PENETROMETER (TSF)	(1.5) - (WITH SHEAR STRENGTH IN KSF)
#200 - Percent Passing #200 SIEVE	UU - UNCONSOLIDATED UNDRAINED TRIAXIAL
RV - R-VALUE	
SA - SIEVE ANALYSIS: % PASSING	
- WATER LEVEL	

PENETRATION RESISTANCE (RECORDED AS BLOWS / FOOT)				
SAND & GRAVEL		SILT & CLAY		
RELATIVE DENSITY	BLOWS/FOOT*	CONSISTENCY	BLOWS/FOOT*	STRENGTH** (KSF)
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 0.25
LOOSE	4 - 10	SOFT	2 - 4	0.25 - 0.5
MEDIUM DENSE	10 - 30	MEDIUM STIFF	4 - 8	0.5-1.0
DENSE	30 - 50	STIFF	8 - 15	1.0 - 2.0
VERY DENSE	OVER 50	VERY STIFF	15 - 30	2.0 - 4.0
		HARD	OVER 30	OVER 4.0

* NUMBER OF BLOWS OF 140 LB HAMMER FALLING 30 INCHES TO DRIVE A 2 INCH O.D. (1-3/8 INCH I.D.) SPLIT-BARREL SAMPLER THE LAST 12 INCHES OF AN 18-INCH DRIVE (ASTM-1586 STANDARD PENETRATION TEST).

** UNDRAINED SHEAR STRENGTH IN KIPS/SQ. FT. AS DETERMINED BY LABORATORY TESTING OR APPROXIMATED BY THE STANDARD PENETRATION TEST, POCKET PENETROMETER, TORVANE, OR VISUAL OBSERVATION.

LEGEND TO BORING LOGS AND SOIL DESCRIPTIONS



PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB5 PAGE 1 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/3/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shesteg**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			GRAVEL ; 4' gravel base						
			ARTIFICIAL FILL (af)						
		SM	SILTY SAND WITH GRAVEL ; SM; slightly moist; strong petroleum hydrocarbon odor (PHCO)						
5									
		SM	SILTY SAND ; SM; fine grained sand; loose; moderate PHCO; wood chunks				6 10 13		
					GB5-7.5'				
10		SP	SAND ; SP; 2.5Y (3/2) very dark grayish brown; fine grained sand; very loose; some PHCO (NATIVE)						
		ML	SILT TRACE SAND TRACE ORGANICS ; ML; 10YR (3/3) dark brown; fine grained sand; very soft; some PHCO				0 1 2		
					GB5-10'				
15		SP	SAND ; SP; 5Y (2.5/3) black; fine grained sand; medium dense; saturated; rounded; very light PHCO				4 9 15		
					BG5-15'				
20									
							8 10 14		
					BG5-21'				

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB5 PAGE 2 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/3/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
25		SP-SM	POORLY GRADED SAND WITH SILT ; SP-SM; 10YR (3/2) very dark grayish brown; 4% fine gravel; 89% fine to coarse grained sand; 7% fines; wet; loose; no PHCO		GB5-25'	DS, SA	3 4 7		25
30			Medium dense; trace wood pieces; no PHCO				2 6 10		30
35		ML	SILT ; ML; 10YR (3/2) very dark grayish brown; medium stiff; no PHCO (NATIVE)		GB5-30'		14 18 23		35
40		SW	SAND TRACE GRAVEL ; SW; 5Y (4/3) olive; fine to coarse grained sand; subrounded; dense; No PHCO		GB5-35'		10 14 17		40
		SW	SAND ; SW; 2.5Y (4/4) olive brown; grading into fine sand; no PHCO		GB5-40'				
		SP	SAND ; SP; fine grained sand; wet; dense; no PHCO						

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB5 PAGE 3 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 TOC ELEV (ft): GROUND ELEV (ft): ---
 INITIAL DTW (ft): **10 5/3/23** BOREHOLE DEPTH (ft): **51.5**
 STATIC DTW (ft): **NA 5/3/23** WELL DEPTH (ft): ---
 WELL CASING DIAMETER (in): --- BOREHOLE DIAMETER (in): **8**
 LOGGED BY: **C. Shesteg** CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
45		SP	SAND ; SP; 5Y (4/4) olive; very fine grained sand; medium dense; trace iron oxide staining; no PHCO		GB5-45'		5 10 11		45
		CL	SILTY CLAY ; CL; 5Y (4/1) dark gray; low plasticity; medium stiff; slightly moist; no PHCO; grades into silt with clay						
50		ML	SILT WITH CLAY ; ML; 5Y (4/1) dark gray; low plasticity; medium stiff; massive; slightly moist; No PHCO		GB5-50'		3 7 10		50
			Hole terminated at 51.5 feet.						
55									55
60									60
65									65

GEO FORM 304 EXXON_EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB6 PAGE 1 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **5 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shesteg**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
		GP	ARTIFICIAL FILL (af) COARSE GRAVEL ; GP; fill material						
5		GW	GRAVEL WITH SAND ; GW; black; fill material; saturated; loose; no PHCO				3 3 3		5
10		SW	SAND ; SW; 5Y (3/2) dark olive gray; fine to medium grained sand; wet; medium dense; moderate PHCO (NATIVE)		GB6-11'		7 10 17		10
15		ML	SILTY SAND ; ML; 2.5Y (3/2) dark grayish brown; very fine grained sand; soft; moist; no PHCO		GB6-15'		0 2 5		15
		SP	SAND ; SP; 5Y (3/2) dark olive gray; fine grained sand; loose; wet; moderate PHCO						
20		SW	SAND ; SW; 5Y (3/2) dark olive gray; fine to medium grained sand; wet; medium dense; moderate PHCO		GB6-21'	DS	5 10 17		20

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB6 PAGE 2 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **5 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
25		SP	SAND ; SP; 10YR (3/2) very dark grayish brown; fine grained sand; wet; medium dense; strong PHCO 2" of silt		GB6-25'		2 9 12		25
30		SM	SILTY SAND ; SM; 10YR (3/2) very dark grayish brown; fine to medium grained sand; loose; grading into silt; moderate PHCO		GB6-31'		3 4 7		30
35			7.5YR (3/2) dark brown; medium dense; 3 inch silt lense; no PHCO Wood fragment at 36'				2 3 10		35
40		SP	SAND ; SP; 5Y (3/2) dark olive gray; fine grained sand; wet; medium dense; no PHCO		GB6-41'		4 10 15		40

GEO FORM 304 EXXON_EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB6 PAGE 3 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **5 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
45		SM	SAND ; SM; 10YR (3/3) dark brown; fine grained sand; grades to silty fine sand, 2.5Y (5/4) light olive brown; saturated; medium dense; no PHCO		GB6-45'		10 12 12		45
50		ML	SILT ; ML; 5Y (3/2) dark olive gray Grades to 3" fine sand with clay; wet; hard Grades back to silt		GB6-50'		10 15 20		50
Hole terminated at 51.5 feet.									
55									55
60									60
65									65

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB7 PAGE 1 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shesteg**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
5			ARTIFICIAL FILL (af)						
5		SW	SAND WITH GRAVEL ; SW; 5Y (4/3) olive brown; coarse to fine grained sand; loose; dry; no PHCO				42 2 7		5
10		SW	SAND WITH GRAVEL ; SW; 5Y (2.5/2) black; very loose; fill material; wood and metal fragments; very strong PCHO with sheen				0 1 0		10
15		SP	SAND ; SP; 5Y (3/1) very dark gray; fine to medium grained sand; wet; loose; very strong PHCO; wood fragments (NATIVE)		GB7-15'		5 7 7		15
20			No recovery				0 2 2		20

GEO FORM 304 EXXON_EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB7 PAGE 2 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
25		SW	SAND ; SW; 5Y (3/2) dark olive gray; fine to coarse grained sand; medium dense; moderate PHCO		GB7-26'		2 10 14		25
30		SP-SM	POORLY GRADED SAND WITH SILT ; SP-SM; 2.5Y (4/4) olive brown; 13% gravel; 80% sand; 7% fines; wet; medium dense; subrounded; no PHCO		GB7-31'	SA	6 10 13		30
35		ML	SILT TRACE CLAY ; ML; 5Y (5/2) olive gray; massive; moist; medium stiff; medium plasticity; no PHCO		GB7-35'		4 7 14		35
40		SC	CLAYEY SAND ; SC; 2.5Y (4/4) olive brown; fine grained sand; moist; very dense; no PHCO		GB7-41'		23 50/6"		40

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:








GB7 PAGE 3 OF 3

DRILLING: STARTED **5/2/23** COMPLETED: **5/2/23**
 INSTALLATION: STARTED **5/2/23** COMPLETED: **5/2/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/2/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **8**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
45							18 29 33		45
		SP	SAND ; SP; fine grained sand; iron oxide staining; no PHCO		GB7-45'				
50			No recovery; medium dense (likely sand based on cuttings)				3 5 6		50
			Hole terminated at 51.5 feet.						
55									55
60									60
65									65

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB8 PAGE 1 OF 3

DRILLING: STARTED **5/1/23** COMPLETED: **5/1/23**
 INSTALLATION: STARTED **5/1/23** COMPLETED: **5/1/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Mud Rotary**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **5 5/1/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestak**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **3.9**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
5			2' asphalt ARTIFICIAL FILL (af) Rock fragments and bentonite				7 5 9		5
		SP	SAND ; SP; 2.5Y (2.5/1) black; fine grained sand; rounded; wet; medium dense				5 5 5		
10			No recovery from 10' to 11.5' ; soil cuttings consist of dark reddish brown fine sand with gravel; loose				3 3 4		
			No recovery from 12' to 13.5' ; soil cuttings consist of dark reddish brown fine sand with gravel				50/5"		
15			No recovery 15' to 16.5' ; wood fragment and gravel blocking sampler; very dense				12 12 12		
		SP	SAND ; SP; 5Y (3/2) dark olive gray; minimal recovery 17' to 18.5' ; fine grained sand; wet; medium dense; rounded (NATIVE)				20 30 41		
20		SP	POORLY GRADED SAND WITH GRAVEL ; SP; 2.5Y (4/4) olive brown; 16% fine gravel; 81% fine to coarse grained sand; 3% fines; wet; dense		GB8-20'	SA			20

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB8 PAGE 2 OF 3

DRILLING: STARTED **5/1/23** COMPLETED: **5/1/23**
 INSTALLATION: STARTED **5/1/23** COMPLETED: **5/1/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Mud Rotary**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft): EASTING (ft):
 LATITUDE: LONGITUDE:
 TOC ELEV (ft): GROUND ELEV (ft): ---
 INITIAL DTW (ft): **5 5/1/23** BOREHOLE DEPTH (ft): **51.5**
 STATIC DTW (ft): **NA 5/3/23** WELL DEPTH (ft): ---
 WELL CASING DIAMETER (in): --- BOREHOLE DIAMETER (in): **3.9**
 LOGGED BY: **C. Shestag** CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
25		SW	SAND WITH GRAVEL ; SW; 10YR (4/3) brown; some medium to fine gravel; fine to coarse grained sand; wet; dense; round to subrounded		GB8-25'		12 19 16		25
30		SP-SM	POORLY GRADED SAND WITH SILT ; SP-SM; 2.5Y (5/4) light olive brown; 14% fine gravel; 79% fine to coarse grained sand; 7% fines; wet; very dense		GB8-30'	DS, SA	20 29 34		30
35		SC	CLAYEY SAND ; SC; 2.5Y (5/4) light olive brown; very fine grained sand; wet; loose				11 6 3		35
40		ML	SILT TRACE CLAY ; ML; 5Y (3/1) very dark gray; massive; moist; medium plasticity; medium stiff		GB8-40'		3 4 11		40

GEO FORM 304 EXXON_EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB8 PAGE 3 OF 3

DRILLING: STARTED **5/1/23** COMPLETED: **5/1/23**
 INSTALLATION: STARTED **5/1/23** COMPLETED: **5/1/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Mud Rotary**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **5 5/1/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **51.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **3.9**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
45		SW	SAND TRACE FINE GRAVEL ; SW; 2.5Y (5/4) light olive brown; fine to medium grained sand; wet; dense; subrounded		GB8-45'		7 23 25		45
			2" layer of fine gravel and silt at 47'; dry						
50		SW	SAND ; SW; 5Y (4/3) olive; fine to medium grained sand; wet; very dense; rounded to subrounded		GB8-51		21 27 38		50
			Hole terminated at 51.5 feet.						
55									55
60									60
65									65

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB9 PAGE 1 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/3/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shesteg**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **46.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **3.9**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
			ARTIFICIAL FILL (af)						
5			5YR (3/2) dark reddish brown; reworked gravels, sands, and silts; moist; loose; moderate PHCO		GB9-6'		1 1 4		5
10			Black; poor recovery; gravels and sands				1 2 5		10
15			Reworked gravels, sands, and silts with wood and metal fragments; moist; moderate PHCO		GB9-16'		3 5 6		15
20		SW	SAND ; SW; 5Y (3/2) dark olive gray; fine to medium grained sand; trace silt; medium dense; no PHCO (NATIVE)		GB9-21'		8 9 10		20

GEO FORM 304 EXXON EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB9 PAGE 2 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/3/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shestag**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **46.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **3.9**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
25		SP	POORLY GRADED SAND ; SP; 5Y (4/3) olive; 3% fine gravel; 92% fine to coarse grained sand; 5% fines; rounded to subrounded; wet; dense; no PHCO		GB9-26'	DS, SA	30 38		25
30		SP	SAND ; SP; 5Y (4/3) olive; fine to coarse grained sand; trace silt; wet; medium dense; no PHCO		GB9-31'		8 10 16		30
35			SILTY SAND ; 2.5Y (5/2) grayish brown; fine grained sand; moist; medium stiff; iron oxide staining; no PHCO		GB9-36'		3 4 7		35
40		SP	SAND ; SP; 2.5Y (5/4) light olive; fine grained; wet; very dense		GB9-41'		11 24 45		40

GEO FORM 304 EXXON_EVERETT_LOGS_20230515.GPJ SECOR INTL_GDT 6/6/23

PROJECT: **Everett Bulk Plant**
 LOCATION: **2717 Federal Ave, Everett, WA**
 PROJECT NUMBER: **203722941**

WELL / PROBEHOLE / BOREHOLE NO:



GB9 PAGE 3 OF 3

DRILLING: STARTED **5/3/23** COMPLETED: **5/3/23**
 INSTALLATION: STARTED **5/3/23** COMPLETED: **5/3/23**
 DRILLING COMPANY: **Holt Drilling**
 DRILLING EQUIPMENT: **CME 85**
 DRILLING METHOD: **Hollow Stem Auger**
 SAMPLING EQUIPMENT: **SPT and California Modified (CM)**

NORTHING (ft):
 LATITUDE:
 TOC ELEV (ft):
 INITIAL DTW (ft): **10 5/3/23**
 STATIC DTW (ft): **NA 5/3/23**
 WELL CASING DIAMETER (in): ---
 LOGGED BY: **C. Shesteg**

EASTING (ft):
 LONGITUDE:
 GROUND ELEV (ft): ---
 BOREHOLE DEPTH (ft): **46.5**
 WELL DEPTH (ft): ---
 BOREHOLE DIAMETER (in): **3.9**
 CHECKED BY: **J. Fischer**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Geotechnical Lab Testing	Blow Count	PID Reading (ppmv)	Depth (feet)
45		SP	SAND ; SP; 2.5Y (4/2) dark grayish brown; medium to fine grained sand; rounded; very fine sand laminations; iron oxide staining		GB9-46'		10 35 50/5"		45
50			Terminate borehole due to heaving sands and potentially locking up augers Hole terminated at 46.5 feet.						50
55									55
60									60
65									65

APPENDIX C

Laboratory Testing Reports – Physical Soil Characteristics

Project Name Everett Bulk Plant
 Source CM

Project Number 203722941
 Lab ID GB8-20'
 Date Received 05-11-2023
 Preparation Date 05-12-2023
 Test Date 05-12-2023

Preparation Method ASTM D 1140 Method A
 Particle Shape _____
 Particle Hardness _____
 Sample Dry Mass (g) 342.40
 Moisture Content (%) 21.1

Analysis based on total sample.

Sieve Size	Grams Retained	% Retained	% Passing
1"	42.80	12.5	87.5
3/4"	0.00	0.0	87.5
1/2"	0.00	0.0	87.5
3/8"	6.40	1.9	85.6
No. 4	6.10	1.8	83.8
No. 8	7.20	2.1	81.7
No. 16	19.80	5.8	76.0
No. 30	50.90	14.9	61.1
No. 50	113.70	33.2	27.9
No. 100	70.10	20.5	7.4
No. 200	17.60	5.1	2.3
Pan	7.80	2.3	---

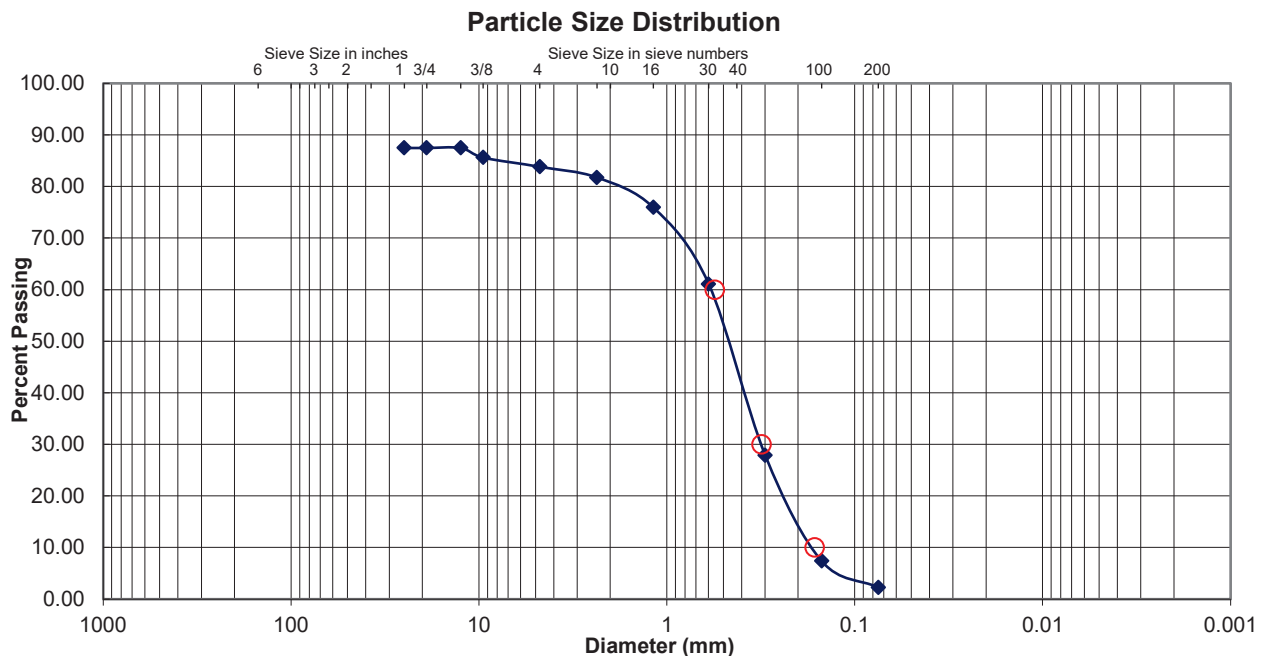
% Gravel 16.2
 % Sand 81.6
 % Fines 2.3
 Fines Classification ML

 D₁₀ (mm) 0.1637
 D₃₀ (mm) 0.3135
 D₆₀ (mm) 0.5564

 Cu 3.40
 Cc 1.08

Classification
Poorly Graded Sand (SP) with Gravel

Classification determined by ASTM D 2487. -200 material classification determined by visual assessment, ASTM D 2488.



Comments _____

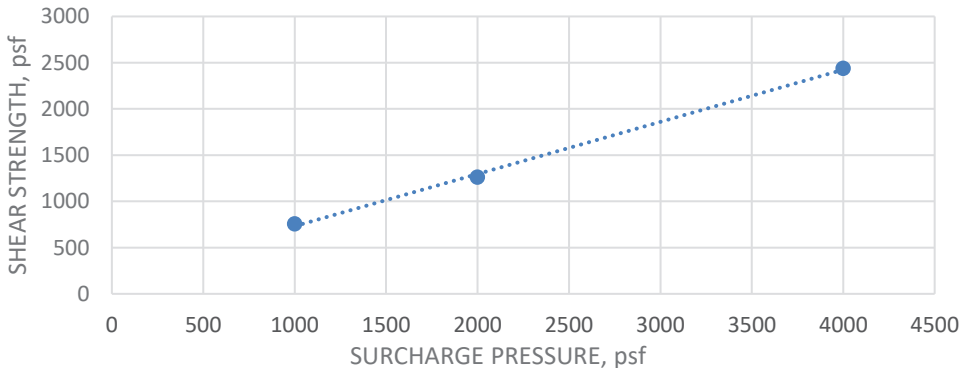
Reviewed By _____

JD & S Testing

Direct Shear Moisture Content & Density

Project Name: Everett Bulk Plant Project Number: 203722941
 Sampled By: Stantec Sample Date: 5/1 - 5/3 Lab #: _____
 Source/Location: GB5-25 Tested By: JP
 Description: SP Test Date: 5/12/2023

Shearing Rate (in./min.)		0.040		
Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)	154.4	185.4	196.7
[B]	Weight of Ring (0.1g)	43.2	45.0	43.8
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)	111.2	140.4	152.9
[D]	Initial Reading	0.0000	0.0000	0.0000
	Time			
	Time			
	Time			
[E]	Final Reading	0.0031	0.0167	0.0202
[F] = [E] - [D]	Height Change	0.0031	0.0167	0.0202
[G] = 1 - [F]	Final Height	0.9969	0.9833	0.9798
Shear Strength (psf)		756	1260	2436
[H]	Final Weight of Wet Soil (0.1g)	103.9	139.0	150.2
[J]	Weight of Dry Soil (0.1g)	88.7	109.4	119.6
[K]	Specific Gravity	2.7		
[L]	Maximum Dry Density (0.1pcf)	88.1		
[M]	Initial Volume (0.01 cubic inch)	4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)	25.4%	28.3%	27.8%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)	92.1	116.3	126.6
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)	73.5	90.6	99.1
[S] = [P] x [K] x [R] / ([K] x 62.3) - [R]	Initial Saturation (0.1%)	66.6%	114.7%	137.7%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)	83.4%	102.9%	112.5%
[U] = [M] x [G]	Final Volume (0.01 cubic inch)	4.59	4.52	4.51
[V] = ([H] - [J]) / [J]	Final Moisture Content (0.1%)	17.1%	27.1%	25.6%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)	86.3	117.1	127.0
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)	73.7	92.2	101.1
[Y] = [V] x [K] x [X] / ([K] x 62.3) - [X]	Final Saturation (0.1%)	36.1%	88.5%	104.1%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)	83.7%	104.6%	114.8%



Cohesion (psf)	170
Friction Angle (degrees)	29

Remarks: _____

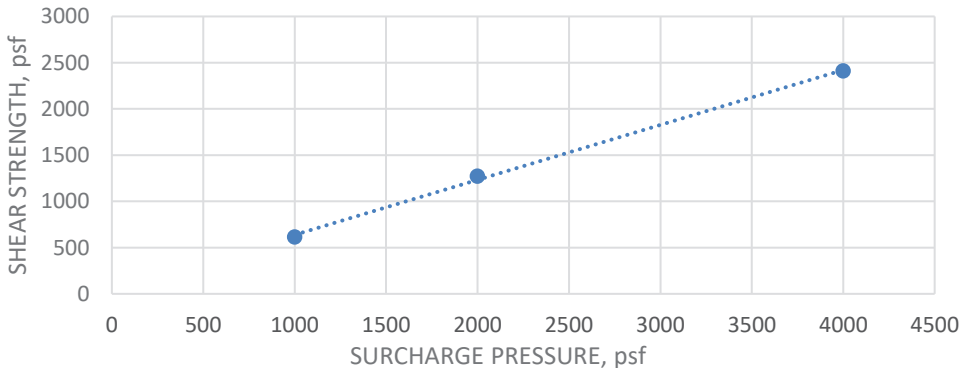
Reviewed by: _____

JD & S Testing

Direct Shear Moisture Content & Density

Project Name: Everett Bulk Plant Project Number: 203722941
 Sampled By: Stantec Sample Date: 5/1 - 5/3 Lab #: _____
 Source/Location: GB6-21 Tested By: JP
 Description: SW Test Date: 5/12/2023

Shearing Rate (in./min.)		0.040		
Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)	194.1	192.2	189.4
[B]	Weight of Ring (0.1g)	43.7	43.0	43.2
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)	150.4	149.2	146.2
[D]	Initial Reading	0.0000	0.0000	0.0000
	Time			
	Time			
	Time			
[E]	Final Reading	0.0278	0.0241	0.0097
[F] = [E] - [D]	Height Change	0.0278	0.0241	0.0097
[G] = 1 - [F]	Final Height	0.9722	0.9759	0.9903
Shear Strength (psf)		612	1272	2408
[H]	Final Weight of Wet Soil (0.1g)	148.9	149.1	145.2
[J]	Weight of Dry Soil (0.1g)	121.2	120.5	114.3
[K]	Specific Gravity	2.7		
[L]	Maximum Dry Density (0.1pcf)	98.7		
[M]	Initial Volume (0.01 cubic inch)	4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)	24.1%	23.8%	27.9%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)	124.6	123.6	121.1
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)	100.4	99.8	94.7
[S] = [P] x [K] x [R] / ([K] x 62.3) - [R]	Initial Saturation (0.1%)	119.5%	116.2%	124.1%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)	101.7%	101.1%	95.9%
[U] = [M] x [G]	Final Volume (0.01 cubic inch)	4.47	4.49	4.56
[V] = ([H] - [J]) / [J]	Final Moisture Content (0.1%)	22.9%	23.7%	27.0%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)	126.9	126.5	121.4
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)	103.3	102.3	95.6
[Y] = [V] x [K] x [X] / ([K] x 62.3) - [X]	Final Saturation (0.1%)	98.1%	99.4%	96.1%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)	104.6%	103.6%	96.9%



Cohesion (psf)	50
Friction Angle (degrees)	31

Remarks: _____

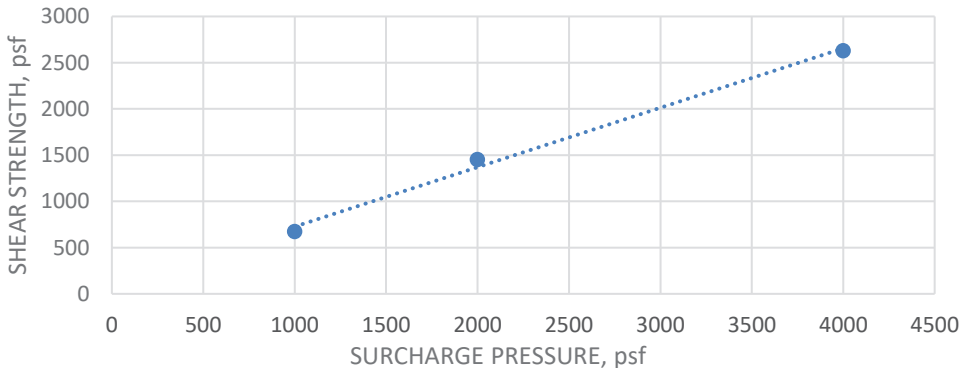
Reviewed by: _____

JD & S Testing

Direct Shear Moisture Content & Density

Project Name: Everett Bulk Plant Project Number: 203722941
 Sampled By: Stantec Sample Date: 5/1 - 5/3 Lab #: _____
 Source/Location: GB8-30 Tested By: JP
 Description: SW Test Date: 5/12/2023

Shearing Rate (in./min.)		0.040		
Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)	190.1	199.6	197.2
[B]	Weight of Ring (0.1g)	43.5	43.3	43.2
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)	146.6	156.3	154.0
[D]	Initial Reading	0.0000	0.0000	0.0000
	Time			
	Time			
	Time			
[E]	Final Reading	0.0037	0.0244	0.0215
[F] = [E] - [D]	Height Change	0.0037	0.0244	0.0215
[G] = 1 - [F]	Final Height	0.9963	0.9756	0.9785
Shear Strength (psf)		672	1452	2628
[H]	Final Weight of Wet Soil (0.1g)	142.9	156.7	151.4
[J]	Weight of Dry Soil (0.1g)	118.5	136.5	125.1
[K]	Specific Gravity	2.7		
[L]	Maximum Dry Density (0.1pcf)	105.4		
[M]	Initial Volume (0.01 cubic inch)	4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)	23.7%	14.5%	23.1%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)	121.4	129.5	127.6
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)	98.1	113.1	103.6
[S] = [P] x [K] x [R] / ([K] x 62.3) - [R]	Initial Saturation (0.1%)	111.0%	91.9%	123.2%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)	93.2%	107.3%	98.3%
[U] = [M] x [G]	Final Volume (0.01 cubic inch)	4.58	4.49	4.50
[V] = ([H] - [J]) / [J]	Final Moisture Content (0.1%)	20.6%	14.8%	21.0%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)	118.8	133.0	128.2
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)	98.5	115.9	105.9
[Y] = [V] x [K] x [X] / ([K] x 62.3) - [X]	Final Saturation (0.1%)	78.6%	88.5%	96.5%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)	93.5%	110.0%	100.5%



Cohesion (psf)	90
Friction Angle (degrees)	33

Remarks: _____

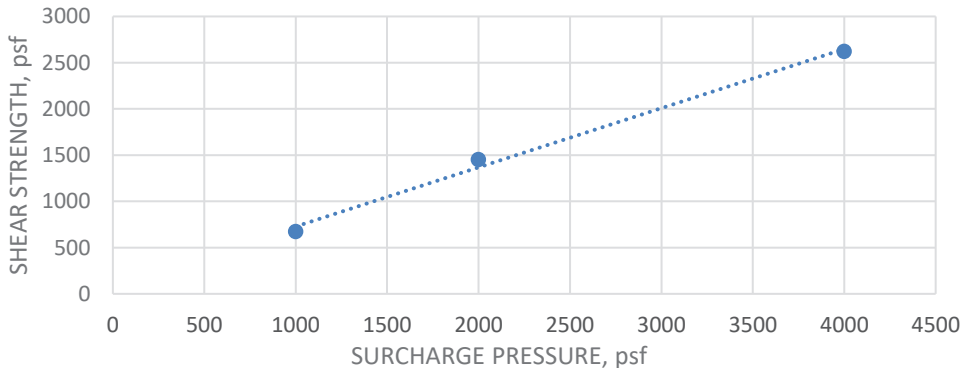
Reviewed by: _____

JD & S Testing

Direct Shear Moisture Content & Density

Project Name: Everett Bulk Plant Project Number: 203722941
 Sampled By: Stantec Sample Date: 5/1 - 5/3 Lab #: _____
 Source/Location: GB9-26 Tested By: JP
 Description: SW Test Date: 5/12/2023

Shearing Rate (in./min.)		0.040		
Normal Pressure (psf)		1000	2000	4000
[A]	Initial Weight of Wet Soil + Ring (0.1g)	196.8	183.7	179.9
[B]	Weight of Ring (0.1g)	45.5	44.5	44.1
[C] = [A] - [B]	Initial Weight of Wet Soil (0.1g)	151.3	139.2	135.8
[D]	Initial Reading	0.0000	0.0000	0.0000
	Time			
	Time			
	Time			
[E]	Final Reading	0.0241	0.0060	0.0132
[F] = [E] - [D]	Height Change	0.0241	0.0060	0.0132
[G] = 1 - [F]	Final Height	0.9759	0.9940	0.9868
Shear Strength (psf)		672	1452	2620
[H]	Final Weight of Wet Soil (0.1g)	147.6	138.0	135.4
[J]	Weight of Dry Soil (0.1g)	118.6	111.8	108.2
[K]	Specific Gravity	2.7		
[L]	Maximum Dry Density (0.1pcf)	93.9		
[M]	Initial Volume (0.01 cubic inch)	4.60	4.60	4.60
[P] = ([C] - [J]) / [J]	Initial Moisture Content (0.1%)	27.6%	24.5%	25.5%
[Q] = [C] / [M] * 3.81	Initial Wet Density (0.1pcf)	125.3	115.3	112.5
[R] = [Q] / (1 + [P])	Initial Dry Density (0.1pcf)	98.2	92.6	89.6
[S] = [P] x [K] x [R] / ([K] x 62.3) - [R]	Initial Saturation (0.1%)	133.3%	100.9%	98.6%
[T] = [R] / [L]	Initial Relative Compaction (0.1%)	104.7%	98.7%	95.5%
[U] = [M] x [G]	Final Volume (0.01 cubic inch)	4.49	4.57	4.54
[V] = ([H] - [J]) / [J]	Final Moisture Content (0.1%)	24.5%	23.4%	25.1%
[W] = [H] / [U] * 3.81	Final Wet Density (0.1pcf)	125.3	115.0	113.6
[X] = [W] / (1 + [V])	Final Dry Density (0.1pcf)	100.7	93.2	90.8
[Y] = [V] x [K] x [X] / ([K] x 62.3) - [X]	Final Saturation (0.1%)	98.4%	78.5%	79.6%
[Z] = [X] / [L]	Final Relative Compaction (0.1%)	107.2%	99.3%	96.8%



Cohesion (psf)	90
Friction Angle (degrees)	33

Remarks: _____

Reviewed by: _____

APPENDIX N

In-Situ Soil Stabilization





Summary of Work:

Cascade Remediation Services, LLC (Cascade) is providing in-situ stabilization (ISS) services by means of injection grouting at the ExxonMobil ADC site in Everett, WA (Site). The proposed ISS area is approximately 30-ft x 60ft and between 15-ft to 20-ft below ground surface as show in the attachment map provide by Stantec. Cascade will mix and inject a neat grout slurry consisting of Type II Portland Cement, Calcium Chloride and Water into an estimated 20 temporary direct push points. A direct-push technology (DPT) drilling rig (Geoprobe-brand 7822DT or similar) will advance a 2.25-inch steel hollow casing with an expendable tip to the bottom of the target depth, once at the targe depth, the tool string will be retracted in 1-foot lifts as a neat cement slurry is pumped into the target zones.

Cascade will provide a daily summary of neat cement injection volumes at each of the ISS injection point. At the completion of the project, draft field logs and relevant field notes will be reviewed and evaluated for quality and accuracy prior to the preparation of a final field services report, which will include, time and date, location of each ISS point, volume of neat cement, depth intervals, application work, rig movement and set up, safety meetings, etc.

TABLE 1 – ISS INJECTION DESIGN PARAMETERS

Item	Specifications	Notes
Site Location	2717 / 2731 Federal Ave, Everett, WA	Paved Area
Site Area	30 ft x 60 ft x 5 ft (9000 cu ft)	15 ft to 20 ft bgs
No. of ISS Points	18 locations	10-foot centers
Reagent	Portland Cement Type II, Water, Calcium Chloride	
Neat Cement Mix	94 lbs Cement 30 gallons water 4 lbs calcium chloride	449 bags – Portland Cement (94lb) 36 bags – Calcium Chloride (50lb)
Volume Per Point	673 gallons (~135/ft)	1 ft lifts
Design Quantity	~13,500 gallons	83% cement slurry
Injection Method	2.25" Direct Push, Bottom Up	Single Point
Pumping System	5x8 ChemGrout Mix/Pump Plant	(2) 600-gallon mix tanks

Cascade Deliverables:

- (1) Geoprobe® 7822 track mounted direct push technology (DPT) drill rig,
- (1) ChemGrout mix/injection plant with a 5" x 8" piston pump and (2) 600 mix tanks, and high-pressure conveyance injection hoses,
- (two) injection tool strings, 2.25" diameter,
- 3-person trained crew,
- Heavy-duty hose protector ramps,



- Forklift – 5,000 lb all terrain,
- Water Truck or Trailer,
- City hydrant meter and Cascade backflow preventer,
- Portable generator,
- PPE; hard hats w/face shield, hearing protection,
- Neat cement grouting materials, Portland Cement Type II and calcium chloride



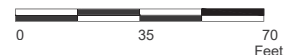
FN 2380003370002

SOURCE: Modified from Images Provided by Google Earth

EXPLANATION

- 7.5' bgs Defined Excavation Extents
- 10' bgs Defined Excavation Extents
- 12.5' bgs Defined Excavation Extents
- 15' bgs Defined Excavation Extents
- 20' bgs Defined Soil Stabilization Extents
- 2011-2012 BNSF Excavation

APPROXIMATE SCALE



PROPOSED EXXONMOBIL ADC EXCAVATION EXTENTS BY DEPTH

EXXONMOBIL ADC
2717/2731 Federal Avenue
Everett, Washington

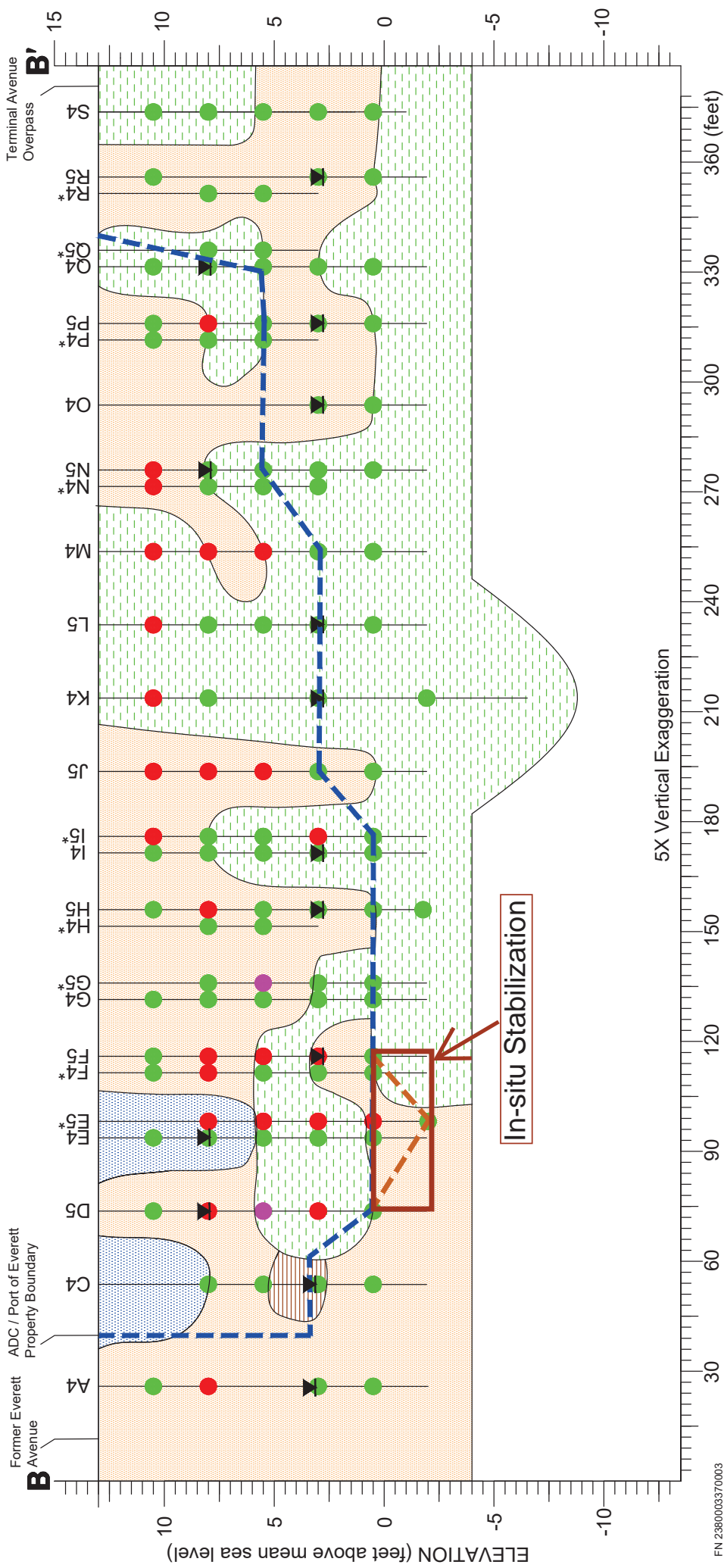
PROJECT NO.
238000337

PLATE
24
LEC: 06/28/23

N

* = No geologic logging was conducted at borings E5, F4, G5, H4, I5, N4, P4, Q5, and R4

S



5X Vertical Exaggeration

FN 2380003370003

EXPLANATION	<ul style="list-style-type: none"> Water Level Encountered During Drilling Hydrocarbon Concentrations in Soil Less Than Site-Specific Residual Saturation Remediation Levels Hydrocarbon Concentrations in Soil Greater Than Site-Specific Residual Saturation Remediation Levels LNAPL Observed During Drilling Proposed Excavation Extents Proposed In-Situ Soil Stabilization Extents
	<ul style="list-style-type: none"> Coarse-grained Gravelly Sediments (GW, GF, GC) Coarse-grained Sandy Sediments (SW, SP, SM, SC) Fine-grained Sediments (CL, ML) Organic Sediments (Wood Debris)

EXXONMOBIL ADC CROSS SECTION N-S
 EXXONMOBIL ADC
 2717/2731 Federal Avenue
 Everett, Washington

PROJECT
238000337

PLATE
25
LEC: 06/29/23

APPENDIX O

Excavation Depth Confirmation Methodology





2D, 3D or automatic control now with a future-proof upgrade path

2D / 3D Machine Control Excavator System

Cut grade quickly and accurately

Cut flat, vertical and 3D surfaces

Fully upgradeable

Improves job safety

Integrated multi-constellation GR-i3 GPS receivers

Upgrade now to a 'future-proof' excavating system

Select the X-53x automatic system now; or start with either the X-52x (2D system) or X-53x (3D indicate system) and easily upgrade them later if the need arises. No matter which system you start with, you will greatly enhance the efficiency of your excavating projects. 3D systems show a 30% productivity increase over non-equipped machines.

Get to grade faster

The 2D system ensures you will always cut to the correct grade, while the full 3D system provides even more advanced positioning assistance that reduces the need for stakeout, grading and survey personnel. An automatic system adds even more productivity and savings, keeping you exactly on grade and letting even novice operators work like a pro. This allows you to work more independently, streamlining your workflow, and allowing you to deliver on schedule.



GPS receivers

The X-53x system features fully integrated multi-constellation GR-i3 GPS receivers for precise positioning of the boom, stick and bucket at all times.



Controller

The future-proof, compact and ruggedized MC-X1 GPS machine controller supports current 2D/3D indicate systems now and future planned enhancements.



Tilt sensors

Tilt sensors are mounted on the boom, stick and bucket for elevation guidance at any angle.



Joysticks

The 3D automatic configuration includes custom joysticks to put the power of automatics at your fingertips.



For more information:
2D: topconpositioning.com/x-52x
3D: topconpositioning.com/x-53x
Auto: topconpositioning.com/AutoX-Info

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7010-2246 B 8/19





FC-500
RUGGEDIZED
FIELD CONTROLLER





A Hand-Held with Maximum Processing Power

- 4.3 in. sunlight readable display
- MIL-STD 810G and IP68 certified
- 1 GHz processor
- 5 megapixel integrated camera (optional)
- Internal 3.5G cellular modem (optional)
- Internal GPS with 1-5 meter accuracy (optional)

The Topcon FC-500 field controller is designed for the construction, mapping and survey professional and is ideal for MAGNET® Field or Pocket 3D software solutions, getting the most out of all Topcon GNSS receivers and optical total stations. The FC-500 has an optional 3.5G cellular modem to instantly connect to MAGNET Enterprise and Sitelink3D™ secure services for sending and receiving data files from active jobsites.

With a capacitive touchscreen, similar to many of the smartphones used every day, the display surface is also extremely scratch-resistant and much more pierce resistant to sharp objects compared with displays in other products.

With the FC-500's internal "intelligent" batteries, there is no worry of ever overcharging. Typical battery life is tested to up to 20 hours with excellent performance under extreme conditions. Recharging is fast and achieves a 50 percent charge in as little as an hour.

The FC-500's external ports are located at the base of the unit: USB Host, USB client micro, power, and audio. The USB Host A is used in the field to quickly copy a large job, coordinate or DXF file to the FC-500. The DB9 serial port is perfect for older total stations that still require a cable.

Sunlight readable display

The FC-500 features a 4.3 in. display designed for viewing in direct sunlight. The display uses a one-touch interface that is optically bonded to increase visibility.



Production from any angle

With a single key touch, the user can change the orientation of the screen from portrait to landscape to increase visibility when viewing maps or 3D drawings.



Large 4.3 in. sunlight readable display

1 GHz processor
512 MB RAM
8 GB flash storage

MIL-STD 810G
IP68 certified

USB host (full Type A)
USB client (micro port)
9-pin serial port



Optional Built-in
5 megapixel camera

3.5G cellular module (optional)
Internal GPS

Built-in *Bluetooth*[®]
Wi-Fi connectivity

6 control buttons
4-way directional arrow key

Hardware	
Processor	1 GHz ARM Cortex A8 i.MX53
Operating System	Microsoft® Windows Mobile 6.5
Memory and Data Storage	512 MB RAM 8 GB flash storage Micro-USB
Camera (Geo, Geo 3G)	5 megapixel resolution with autofocus and LED flash with video capture
Power	12/24V DC power input Intelligent Li-Ion battery 3.6V DC at 10600 mAh
Communication	
Ports	COM1 RS-232C (D-sub 9pin) 5V DC Power USB Host (Full A) USB Client (Micro)
Wireless Connection	Bluetooth® Wi-Fi 802.11 b/g/n
Cellular Connectivity (Geo 3G only)	Integrated Worldwide, 800/850, 900, 1800, 1900, 2100 MHz, UMTS/HSPA+

Kit components

- FC-500
- Battery and charger
- International plug kit
- USB cable
- Quick start guide
- Hand strap
- Screwdriver
- Stylus



Built to survive

In addition to IP68 certification, which protects against dust and allows the unit to be waterproof up to one meter, the FC-500 is independently certified to MIL-STD 810G standard, and can operate in temperatures from -30°C to 60°C.

Processing power for production

Windows Mobile® 6.5 operating system provides a modern operating environment and added expandability with other software applications. The 1 GHz processor drives any Topcon field application software with ease.

Image and imagine

A 5 MP auto focus camera with LED flash comes as standard equipment. Quickly aim and capture unlimited photos to then associate within either MAGNET Field or Pocket 3D software. These informative photo notes are available “downstream” for office staff and managers.

Jobsite data transfer

The optional internal cellular modem instantly enables a direct connection to or from your active project site. Connect to either MAGNET Enterprise or Sitelink3D services for complete and customized project management.



For more information:
topconpositioning.com/fc-500

Specifications subject to change without notice.
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7010-2155 B 2/16

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MAGNET

Your Work Connected



Table of Contents

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Introduction

MAGNET Software Suite:
Field, Cloud and Office

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In the Field

MAGNET Field for Increased
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MAGNET Software Suite

Field, Enterprise and Office

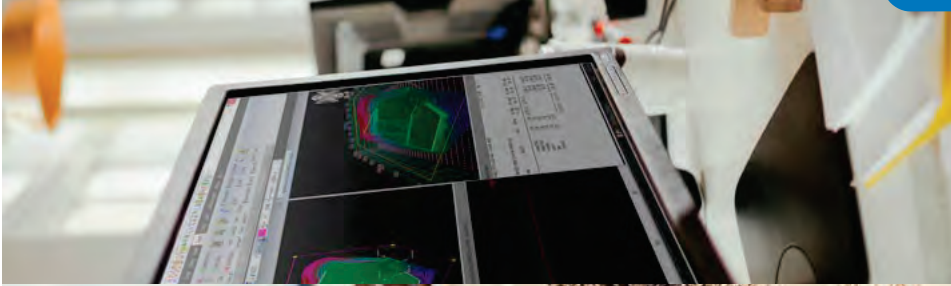


The construction industry is looking for new solutions to cut down on the billions of dollars lost each year due to inaccurate and incompatible project data leading to rework and collaboration breakdowns.

The MAGNET software suite addresses this need by streamlining workflows for contractors, surveyors, modelers, estimators and project managers across each stage of a construction project. This field, cloud and office software suite, when combined with Topcon's state-of-the-art instruments and machine control, enable users to create and access the right data, in the right place, all the time.

MAGNET is a comprehensive, connected and compatible solution that closes the gap between the survey and construction industries.





MACUNET®

A key component of Topcon's digital ecosystem.

Planning | Survey | Design | Layout | Execution | Inspection | Maintenance



Comprehensive

MAGNET provides full application coverage with end-to-end workflows for contractors and surveyors. This software suite improves productivity across the entire project:

Earthmoving and paving

Improve earthmoving and paving machine-control efficiency by quickly creating machine-ready constructible models and estimates to win more projects and save on materials. MAGNET maximizes your data and resources from earthworks to concrete, asphalt paving and resurfacing applications.



Stakeout and surveying

Create highly productive workflows for stakeout as well as for gathering survey and construction-location data in the field. Seamlessly transfer that data to the cloud and create finished digital terrain deliverables in the office. This connected workflow approach creates successful and collaborative outcomes from initial field surveys to the finished project.



Bulk earthmoving

Moving large amounts of earth offers a great opportunity to save on materials with automated mass-haul optimization and location-based scheduling tied directly to excavators and haul trucks. MAGNET reduces risk and helps you stay on schedule to successfully tackle even your most challenging projects.



Building Construction

Simplify your layout and construction-verification processes whether you start your workflow from printed plans, PDFs or fully coordinated Building Information Models (BIM). Connecting the field layout crew to the office has never been easier.



Connected

A connected approach to your projects includes seamless field-to-office collaboration with one set of plans that are always up to date across the project team. Integrated field, office, machine, instrument and third-party software keeps your project team connected so that they are on the same page working more efficiently together towards a productive and profitable outcome.

Compatible

Seamless integration eliminates boundaries, data silos and the limitations inherent in mixed-fleet situations, providing a totally compatible solution that just works. This makes it possible to combine drawings in multiple formats—including third-party data via a field-controller device or office software—with minimal conversion effort or data loss.

MAGNET is compatible with more than 50 industry-standard drawing formats. Those formats can be imported to enable a jobsite to work with compatibility from survey and layout to machine control.





In the Field

MAGNET Field for Increased Accuracy and Efficiency



The engine to field productivity

MAGNET Field, the engine for our field-productivity package, is designed to accelerate productivity, increase accuracy and better connect project teams. The intuitive software is easy to learn and use and yet has the power to solve even the most complex positioning challenges. Surveyors and contractors alike use MAGNET Field to collect data points, stake out road and site projects, lay out building components and perform land surveys. Running MAGNET Field on a ruggedized Topcon controller brings field-proof high-computing capabilities directly to your jobsite.

Field-based data management

The growing trend is for field personnel to handle data like control points, construction drawings, quality reports and as-built documentation directly from the field controller. In many cases, this can even be done without the need for office software. Quickly set up your projects; store the information you need; share your daily work instead of sending the whole file back and forth each day; and securely back up the data to the cloud.



MAGNET Field Highlighted Features



Easy to use and learn

Users can navigate to more points per day and easily lay them out with straightforward commands for streamlined and dependable workflows. Whether starting fresh or switching from another software platform, you will have a smooth transition to MAGNET Field.

3D layout

Create 3D layouts with a BIM interface that enables multiple floor views including filtering by level using the popular IFC file format. Create object-insertion points to lay out 3D objects directly in the field software.

Data handling

Display project data faster and handle larger and more complex jobsite files using 3D viewing and filtering. Field users can lay out and collect points on even the most complicated infrastructure projects.



MAGNET Field Highlighted Features



Professional field-based, quality reporting

Create professional reports and annotated photographs directly from the field to immediately share positioning accuracy, tolerances and observations. Improve documentation to reduce the high cost of rework caused by undiscovered inaccuracies, poor data and miscommunication.



Map-based workflows

Avoid lost time switching between screens thanks to flexible workflow options controlled directly from the map view. Workflow options include staking project data, adjusting layer settings, displaying backgrounds, adding data levels, viewing GNSS settings and showing visual offsets.



Hybrid GNSS and total stations control

Simultaneously connect to GNSS and optical sensors while the software optimizes measurements between the two technologies. This significantly increases productivity by allowing users to accurately capture points with fewer total-station set-ups even when the line of site is lost.





MAGNET Field Layout

This data-collection software is designed specifically for quick and accurate layout and construction verification. With in-the-field plan and dimensional entries, you can move from paper plan or 3D model to building layout faster than ever. MAGNET Field Layout also includes scanning capabilities for use with construction-verification workflows.





MAGNET Vision

See visual aids on smart glass lenses and control instruments via voice commands. This software enables users to precisely lay out and measure points on a job site, increasing productivity and worker safety with hands-free operation. The system is an add-on to MAGNET Construct field-controller software and utilizes third-party Vizux Blade smart glasses.

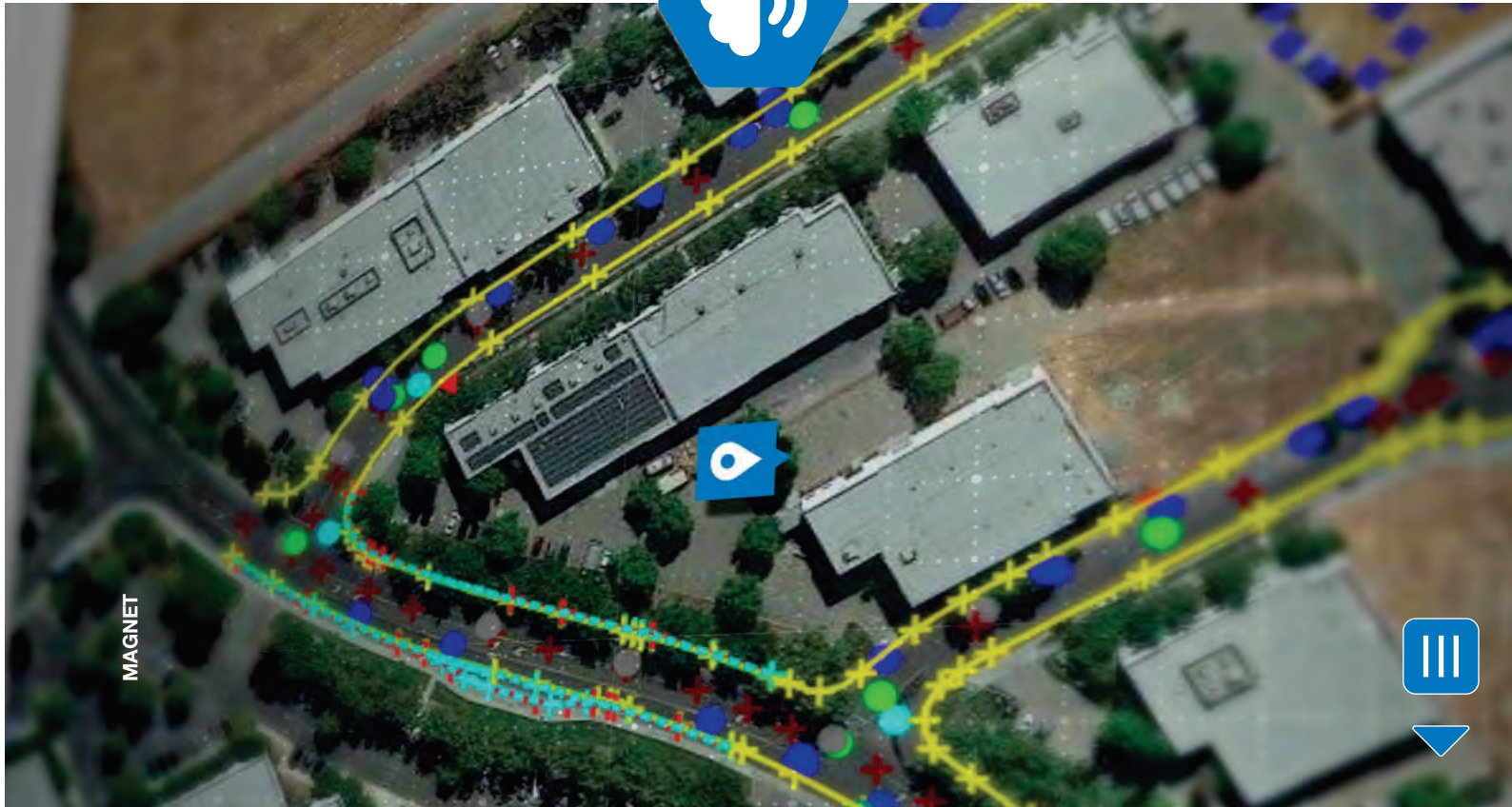




In the Cloud

MAGNET Enterprise for Efficiently Managing Geopositioning Data





MAGNET Enterprise

Store data and insights for access by field crews, machine operators and office team members using MAGNET software, Sitelink3D, Autodesk or Bentley solutions. This web service provides seamless field-to-office connectivity for your projects, making a real-time connected data environment possible. Project data is saved to the map, and files can be instantly converted and shared with a field controller or machine. MAGNET Enterprise improves productivity as downtime and do-overs are minimized by providing the entire project team with increased accessibility to accurate and consistent cloud-connected geopositioning data.

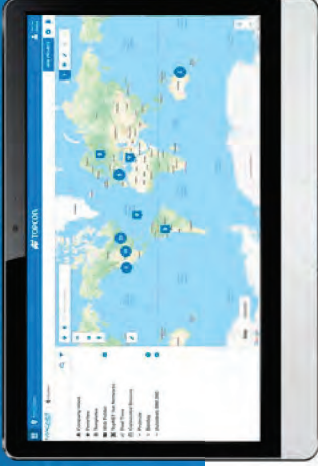


MAGNET Enterprise Highlighted Features



All your projects on a web-interface map

Connect the digital and the real worlds with a visual map of your project datasets directly georeferenced to the earth with background maps.



Cloud-based data management

Keep the entire project team working on the latest plans, and benefit from single-click data conversion to share survey and constructible models directly to instruments and machines on site.



Real-time collaboration

Annotate or redline the map or plans in the cloud browser to directly transfer instructions or notes to keep your field crew working at maximum efficiency.



MAGNET cloud integrations

Give your project team greater access and visibility to geospatial cloud-connected data, whatever its format or source.



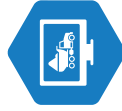
MAGNET Field and Office

Securely access and share data directly from MAGNET Field and Office software or directly access data insights via the web interface.



Sitelink3D machines

See all your equipment on each job site in real time directly from your desktop or mobile device.



Haul truck mobile app

Automatically update the MAGNET master-schedule haul volumes and locations with the Haul Truck cloud integration.



Autodesk

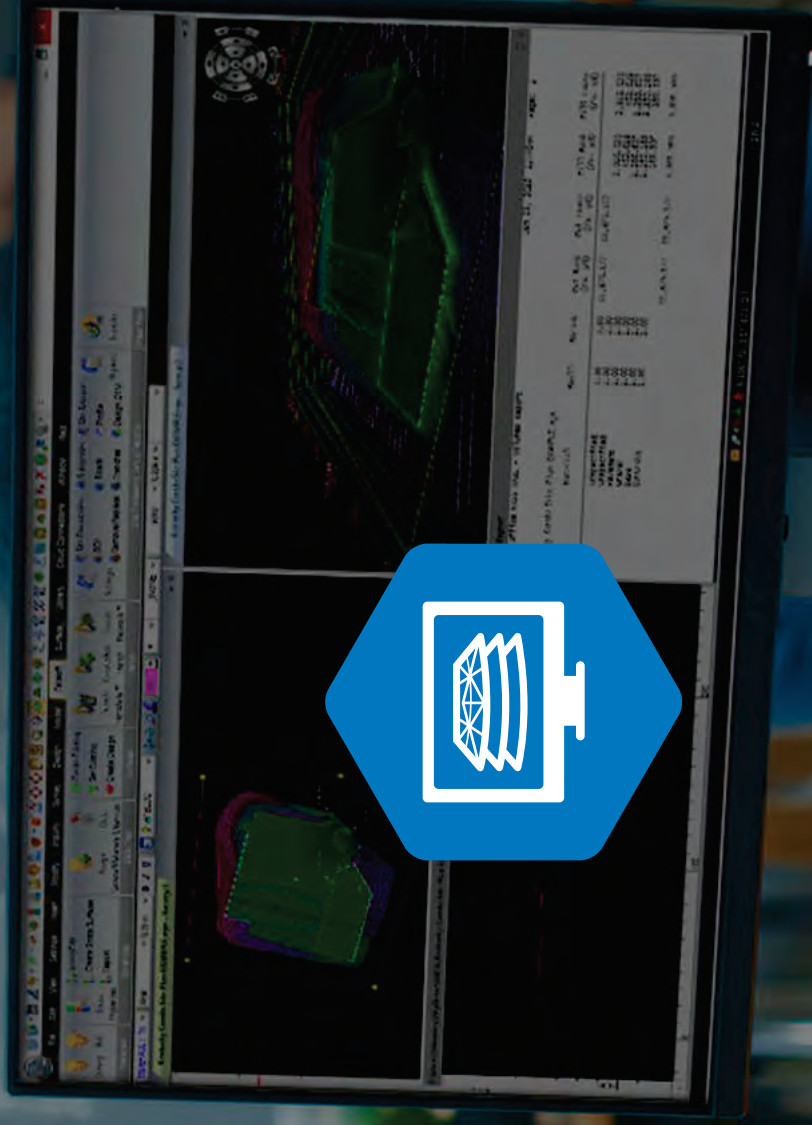
Autodesk BIM 360 document files and project folder structures are directly accessible from the MAGNET software suite in the field and office. Additionally, a Topcon ribbon can be applied within Autodesk Civil 3D for easy file exchange and cloud connectivity.



Bentley

Bentley ProjectWise files and project folder structures are directly accessible from the MAGNET software suite in the field and office.

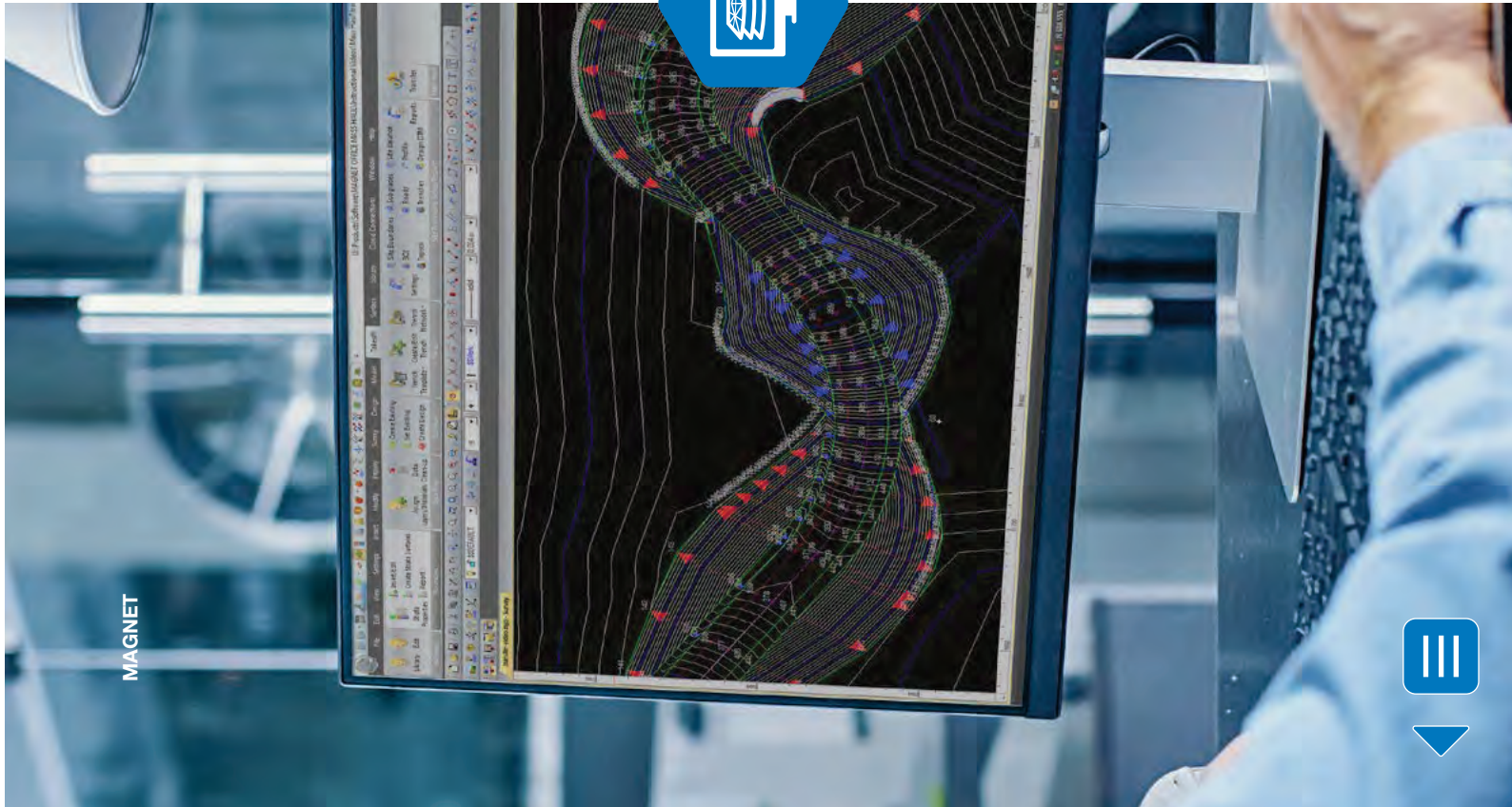




In the Office

MAGNET Office for Productive and Profitable Workflows





MAGNET Office

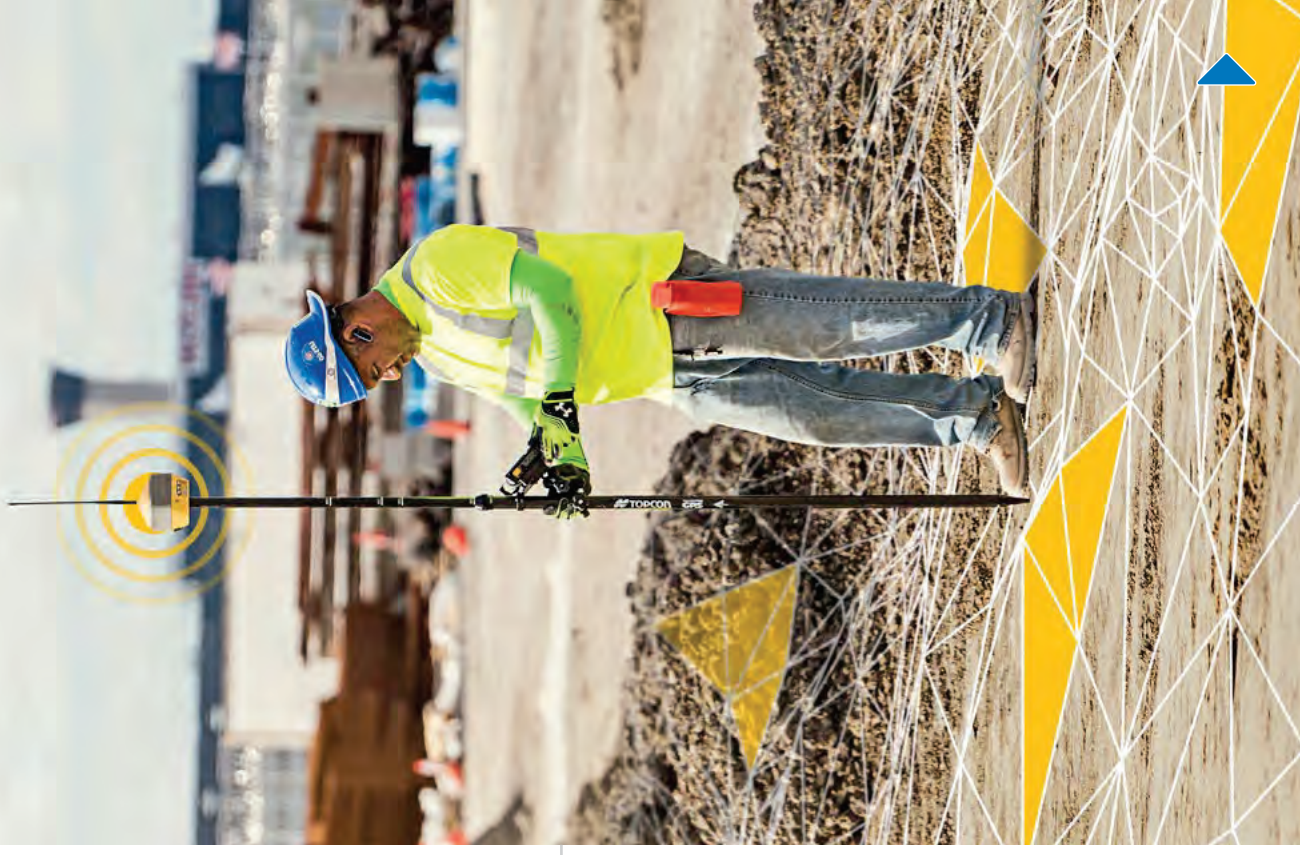
Stay in charge of your project data set. This office-software companion to our field-productivity solutions handles the data import-and-export needs and provides project insights for better site management and improved profitability. You can optimize digital-infrastructure workflows including machine-control models, material takeoffs, final survey deliverables, point-layout files, paving-resurfacing design and location-based project scheduling for mass-haul earthmoving.

These capabilities make MAGNET Office particularly well-suited for earth-moving, paving and surveying applications.



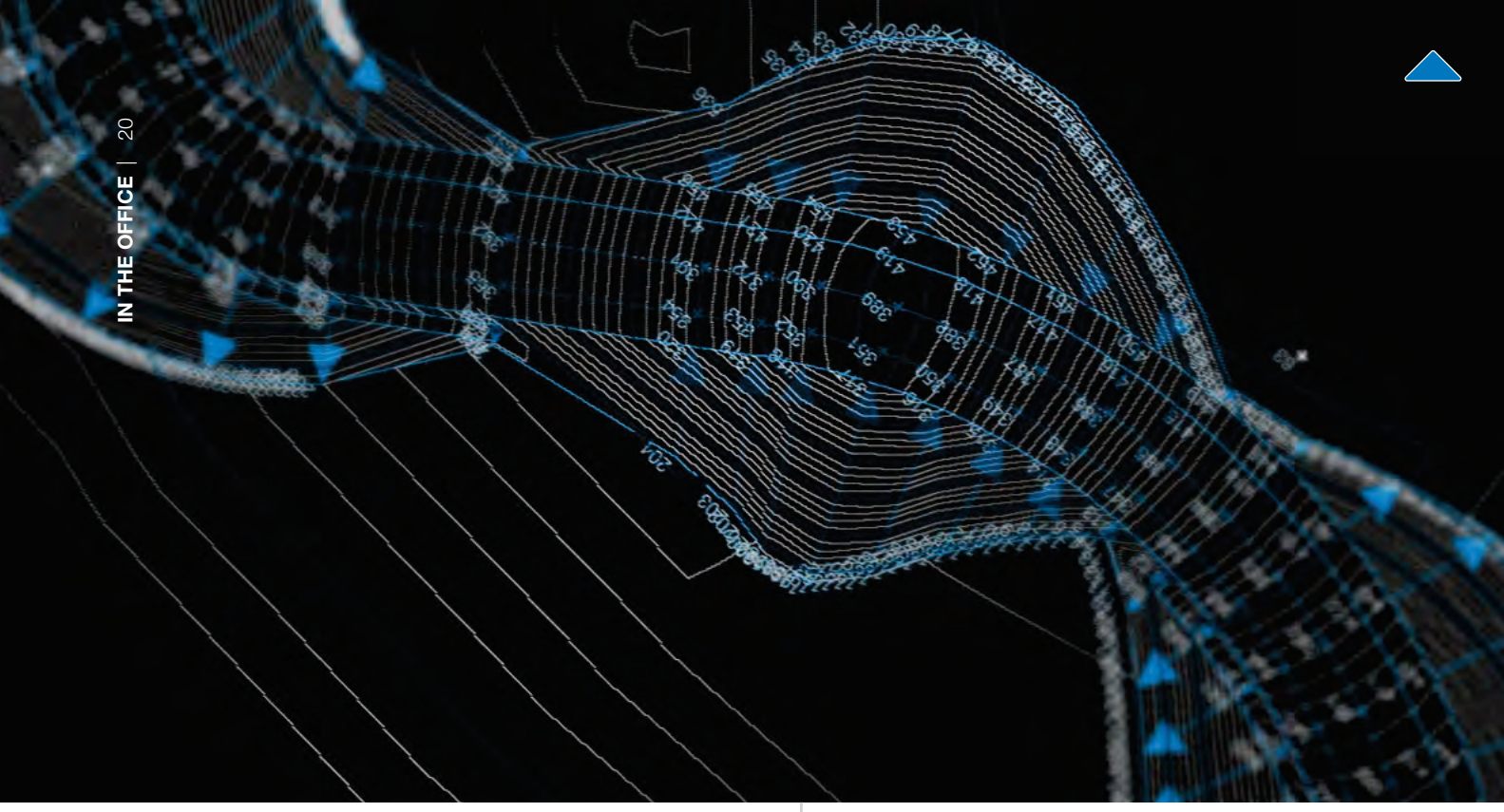
Constructible digital terrain models

MAGNET Office software enables you to efficiently combine plans and survey data to build machine-and-instrument-ready constructible 3D digital-terrain models for sitework, corridors, roads, paving and trenching. MAGNET digital-terrain models can be directly transferred to machines, field personnel or project stakeholders for a better-connected project team. Triangulated digital-terrain models provide a data-efficient physical project representation making it possible to create topographical maps, extract cut-and-fill volumes, and provide progress reports for a bill of quantities, planning and scheduling.



Digitize workflows, both simple and complex

Even if you are just starting your digitization journey, you can quickly be working with improved machine control files, converting estimation methods from paper to 2D or 3D models, or efficiently creating survey deliverables. Digitize your everyday tasks including setting up points for layout, converting PDFs to CAD files and calculating takeoff volumes. If you want to save on materials and reduce risks to the schedule, dive deeply into the powerful mass-haul, project-management capabilities. To better align your project team, create texturized models from your project data sets to provide a visual collaboration tool.



Mass-haul project management

Use our mass-haul digital tools to plan, schedule and optimize your construction project. Evaluate design solutions and their impact on the overall schedule, mass balance and project feasibility. Generate a bill of quantities from the constructible 3D model; and combine it with maps and production resources for a unique, location-based visual overview of even complex civil projects. The MAGNET Office connection to the Haul Truck app and SiteLink3D provides a direct link to track hauls in real time to update the project schedule.



MAGNET Office Earthmoving Feature Highlights



Model building, estimating and data preparation

Bring your construction plans to life with precision. Enter site-specific construction materials; quickly build design surfaces; create cost and volume reports; and develop 3D models. Bid and manage each project—including site work and large-scale road work—quickly, accurately and successfully.



Mass Haul construction management

Reduce scheduling risks and plan your large-scale construction and earthmoving projects more efficiently. Easily calculate mass haul distances; adjust the schedule; and update quantities and production rates. Efficiently track your hauls and stay ahead of schedule with a direct connection to real-time haul data.



MAGNET Office Paving Feature Highlights



SmoothRide asphalt resurfacing workflow

MAGNET's easy-to-use digital-resurfacing design tool is designed for paving or milling projects. Quickly produce cross-slopes, transitions, smoothing, milling, lifts and IRI (International Roughness Index) calculations; and send design files directly to the field.



Concrete paving machine control files

Create alignments for curb and gutter applications, or simply convert and clean up design data so that it's ready for construction. Preparing machine-control files inhouse gives you more flexibility and enables you to be more responsive, keeping your field crew at top efficiency.

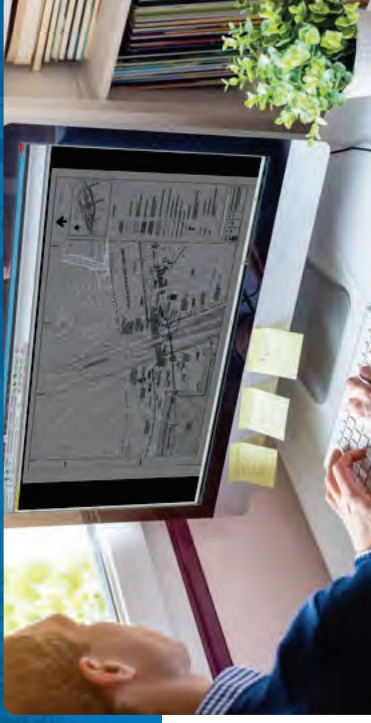


MAGNET Office Survey Feature Highlights



GNSS post-processing

Post-process GNSS data to efficiently create points, lines and surfaces. MAGNET software provides the most productive workflow for gathering survey, construction, and location data, and for producing highly accurate deliverables.



Data analysis and topographical map making

MAGNET's CAD functionality helps users prepare survey maps, plats and proposed design plans. Enhance productivity in the office while addressing data-exchange challenges and improving project team alignment.





MAGNET Collage

Process, combine and analyze multi-source point cloud data from traditional survey instruments as well as reality capture laser scanners, mobile mapping systems and UAVs. Easily export to industry standard modeling or CAD software or directly publish online with MAGNET Collage Web for improved collaboration among stakeholders.

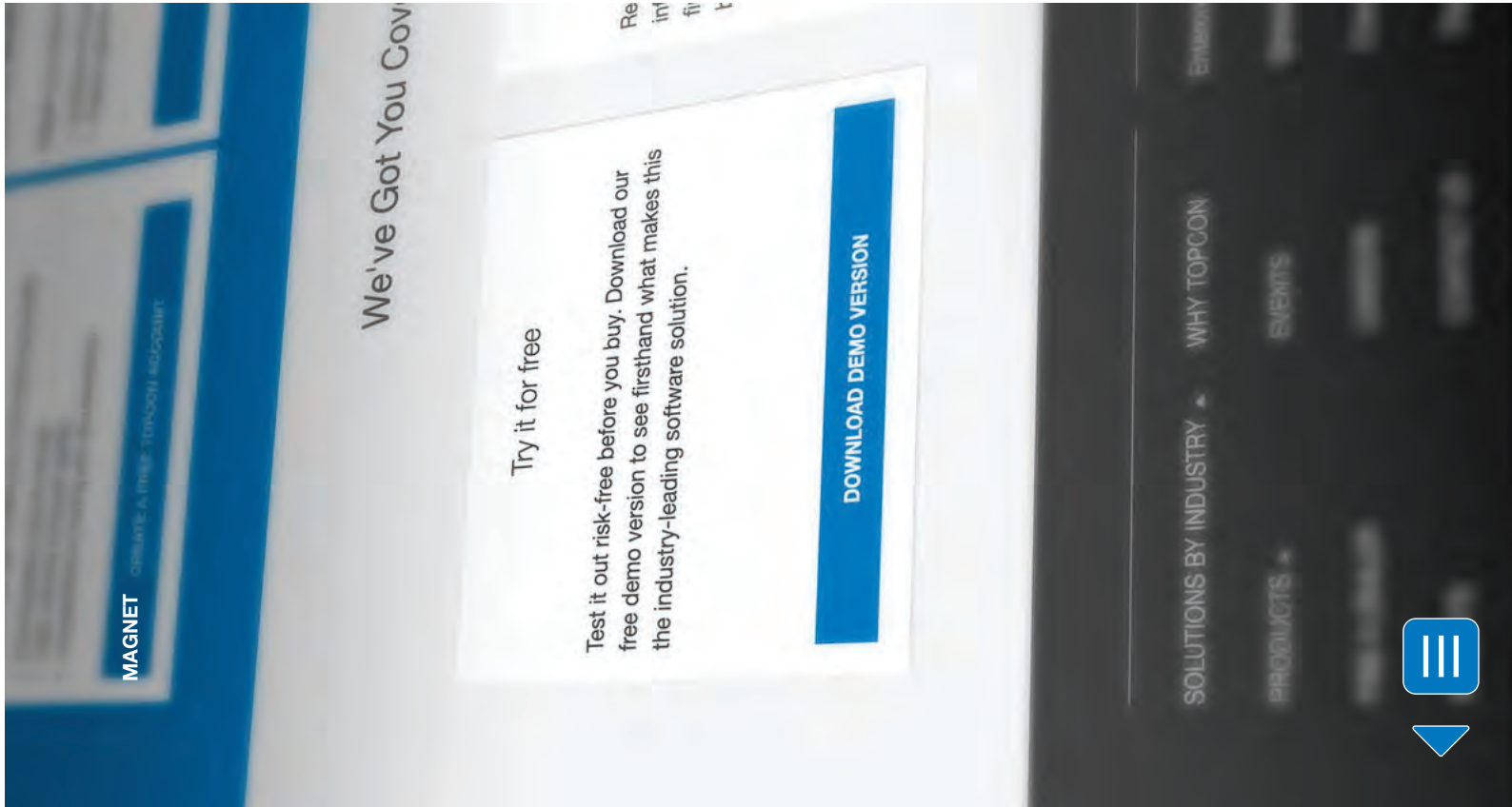




Getting Started

Get started by selecting the configuration needed for your project. Whether you “test drive” or purchase, you will benefit from our training content that is designed to maximize your experience and enhance your productivity.





MAGNET Trials

There are two ways to access trials for Field and Office products to see the benefits up front. You can download the software from topconpositioning.com and use in demonstration mode to test drive the software. Or, if you would like to try the complete software without limitation, contact a Topcon dealer for a 30-day trial license. Current MAGNET users who want to try out MAGNET Enterprise can find the cloud service directly on the Topcon website within the “My Apps” menu. Fully featured use is included with a subscription or active license service package for MAGNET Field or Office.



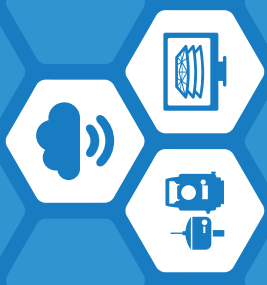
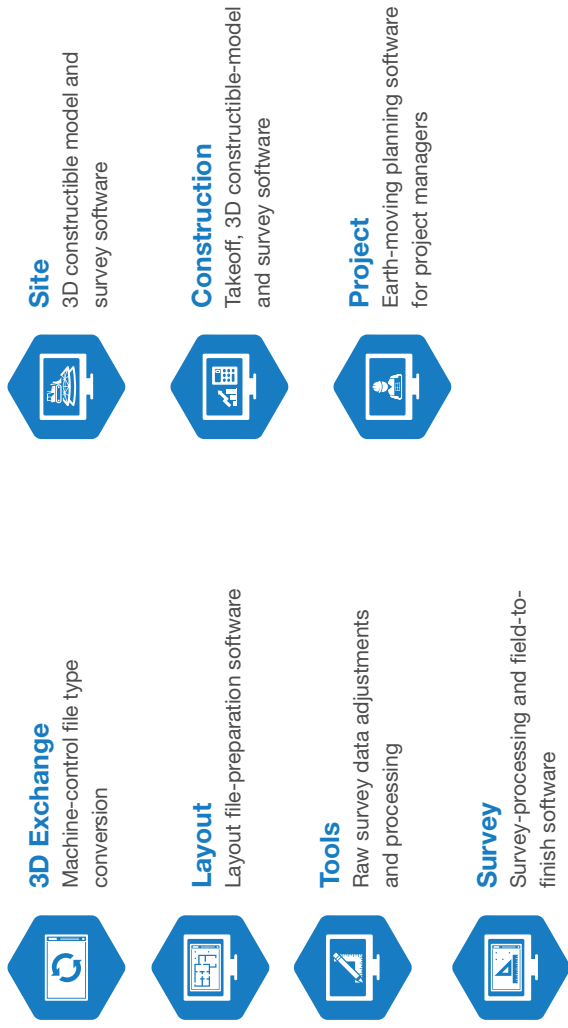
License Options

MAGNET Field and Magnet Office are available as either a subscription or permanent license. Subscriptions to MAGNET software offer benefits like transparent budgeting with low initial costs and access to the latest features in each software release. To streamline administration and avoid any lapses in your subscriptions, we offer a subscription manager.



MAGNET Office configurations

MAGNET Office is one software installation package that includes distinct configuration options.



MAGNET Office configuration selection chart

Customer type	Machine Control	Sitework Layout	Survey	Survey	Earthmoving and Survey	Earthmoving, Paving, and Survey	Earthmoving, Survey, Paving, and Scheduling
MAGNET Office Configuration							
Functionality	3D Exchange	Layout	Tools	Survey	Site	Construction	Project
MAGNET Enterprise Field-to-Office connectivity	X*	X	X	X	X	X	X
Sitelink3D v1 and v2 connectivity	X*				X*	X*	X*
Processing and adjustments for GNSS, total stations, digital levels			X	X	X	X	X
Machine control data conversion and preparation	X			X	X	X	X
Layout point creation		X		X	X	X	X
Finished survey CAD deliverables				X	X	X	X
Road and site design				X	X	X	X
Corridor design					X	X	X
Machine control modeling					X	X	X
Take off and material quantities						X	X
Paving resurfacing design						X	X
Location-based scheduling							X
Resource and mass haul optimization							X

*with separate purchase



MAGNET Field Software Offering



Field

Data-collection software

Operating System: Windows® 10

Subscription includes all modules:

- Robotic total station
- GNSS module (includes mmGPS)
- Roads module
- Piping & trenching module
- Hybrid-positioning module
- Scanning and imaging module



Construct

Mobile app for control of total stations and GNSS

Operating Systems: Android™ and iOS

Separate subscriptions:

- MAGNET Construct
- MAGNET Construct with MAGNET Vision app



Field Layout

Guided layout field software

Operating System: Windows® 10

Subscription includes all modules:

- Robotic total station layout
- Scanning and imaging module



MAGNET Enterprise Offering



Enterprise

Cloud-based data storage
connecting field and office teams

Enterprise is included in any MAGNET subscription. One year of MAGNET Enterprise is also included with a permanent license of MAGNET Field or Office.



Support

We offer a comprehensive array of support options including direct access to a comprehensive library of myTopcon training and support content in a mobile-friendly format. With single sign-on access you can browse by product for informative quick guides and training videos. View the latest webinar or other E-learning content to advance your professional knowledge and stay on top of the productive digital workflows that advance your business.





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