

F1

F2

Utilities

Sewer

- SS Sanitary Sewer
- PS Process Sewer
- K6 K6 Sewer

Water

- F Fire Main
- W Water

Other

- C Communication Cable
- O Fuel Oil
- G Natural Gas
- SD Storm Drain

- Blue Creek
- Operational Areas of Focus
- Operational Area

Notes:

1. Utility locations are approximate. Dashed lines represent above ground utilities.
2. Monitoring well and other sampling locations may change based on utility locates completed in the field.

N

0 60 120 Feet

Utility Map
MOU-F (OA-F1, OA-F2)

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / MMP	FIGURE NO. 10J
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA

GIS Path: \\AGP-Sea-01\Geodata\Projects\Georgia Pacific\GIS\GP_RI_AS130290L\GP_RI_AS130290L.aprx | Utility Map_F-1_F-2 | User: MeredithePerry | Print Date: 7/11/2025

Previous Investigation Explorations

- Boring/Geoprobe Sampling Location
- Surface Water Monitoring *April 2011*
- Sediment Sampling Location
- Soil Sampling Location
- Test Pit *GP, 2022*
- Existing Monitoring Wells
- Outfall
- Previous Investigation/Cleanup or Sampling Event
- Area Inaccessible due to Ongoing Operations
- Approximate Extent of Inert Solid Waste Landfill
- Operational Features
- Mill Operational Areas

Notes:

1. All locations are approximate.
2. Additional information about previous investigations and cleanups is summarized in Table 3.
3. There are monitoring programs for compliance with existing permits and programs that pre-date the Agreed Order and continue to occur in parallel with RI activities (see Table 3).

N

0 400 Feet

Data source credits: None || Basemap Service Layer Credits: NA

Previous Investigations

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 11A
	PROJECT NO. AS130290L	REVISED BY: ---/---	

GIS Path: \\AGP-Sea-01\Geodata\Projects\Georgia\Mxd\GP_RI_AS130290L\GP_RI_AS130290L.aprx | Layout: 11a Previous Investigations | User: MadelineMeury | | Print Date: 7/30/2025



- Existing Monitoring Wells
- Outfall
- Current NPDES Permit Monitoring Location
- Previous Sediment Sampling Location
- Secondary Solids Sampling Location
- Operational Features
- Previous Investigation/Cleanup or Sampling Event
- Mill Operational Areas
- Area Inaccessible due to Ongoing Operations

Notes:

1. All locations are approximate.

N

0 700 Feet

Previous Investigations

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 11B
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA

GIS Path: \\AGP-Sea-01\Geostat\projects\Georgia\Pacific\GDP_RI_AS130290L\GDP_RI_AS130290L.aprx | Layout: 11b Previous Investigations | User: Madeline Perry | | Print Date: 7/30/2025



DFW Priority Habitat

Mill Property 500-ft Boundary

Operational Areas

Land Cover Type

- Developed-Vegetated
- Impervious
- Undeveloped-Vegetated
- Open Water
- Railroad

Notes:

1. *All locations are approximate.*
2. *The boundary shown on this figure is a preliminary depiction of the Mill Property based on property with current or historical industrial activity related to the Mill. The Site will be defined by the remedial investigation results.*
3. *Land cover information based on aerial imagery and Clark County land cover mapping.*
4. *Priority habitat information based on Department of Fish and Wildlife (DFW) mapping.*

N

0 325 650

Feet

Land Cover and Habitat Area

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / MMP	FIGURE NO. 12A
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: NA

GIS Path: \\AS-Sea-01\Geodata\projects\Georgia\Mxd\GP_RI_AS130290L\GP_RI_AS130290L.aprx::12A Land Cover and Habitat Area\n| User: Madeline.Perry | | Print Date: 7/10/2025



GIS Path: \\AGP-Sea-01\Geodata\projects\Georgia\Port\GDP_R_AS130290L\GDP_R_AS130290L.aprx: 12B Land Cover and Habitat Area | | User: Madeline.Perry | | Print Date: 7/30/2025

DFW Priority Habitat

Mill Property 500-ft Boundary

Mill Operational Areas

Land Cover Type

- Developed-Vegetated
- Impervious
- Undeveloped-Vegetated
- Open Water
- Railroad

Notes:

1. *All locations are approximate.*
2. *The boundary shown on this figure is a preliminary depiction of the Mill Property based on property with current or historical industrial activity related to the Mill. The Site will be defined by the remedial investigation results.*
3. *Land cover information based on aerial imagery and Clark County land cover mapping.*
4. *Priority habitat information based on Department of Fish and Wildlife (DFW) mapping.*

N

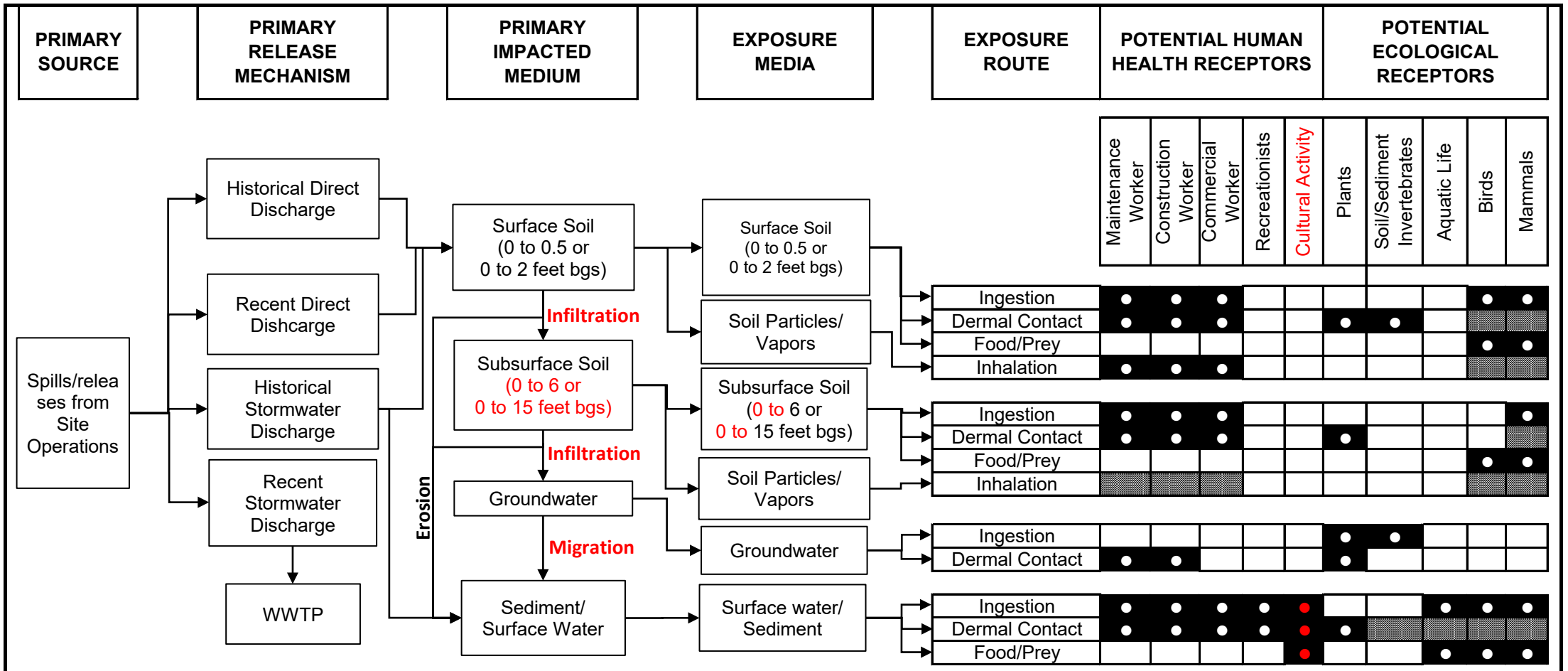
0 400 800 Feet

Land Cover and Habitat Area
Lady Island

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / MMP	FIGURE NO. 12B
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA



Notes:

[1] Where depth to groundwater is shallow, exposure depths will be limited to 2 feet below the groundwater table.

[2] Stormwater includes overland flow.

[3] The soil vapor exposure pathway applies to VOCs if they are identified.

● Complete exposure pathway

▒ Potentially complete but likely insignificant pathway

□ Incomplete exposure pathway.

Definitions:

WWTP - waste water treatment plant bgs - below ground surface VOC - volatile organic compounds

Preliminary Conceptual Site Model

GP Camas Mill

Figure 13

Camas, Washington | June 2025

GIS Path: \\AGP-Sea-01\Geosites\projects\GeorgiaPacific\GP_AS130290L\GP_AS130290L.aprx 14A Proposed Monitoring Well Locations || User: Madeline Peery || Print Date: 7/30/2025

MW-1
MW-2
MW-4
MW-3
MW-5
MW-E1.1
MW-E1.6
MW-E1.4
MW-E1.5
MW-E1.3
MW-E1.2
MW-E1.7
MW-E1.8
MW-E1.9
MW-B3.1
MW-B1.1
MW-B6.1
MW-B1.4
MW-B3.2
MW-B1.5
MW-B4.3
MW-B4.2
MW-B1.2
MW-B4.1
MW-C1.2
MW-B1.3
MW-C3.1
MW-A1.2
MW-C3.2
MW-C1.1
MW-C4.2
MW-A1.3
MW-C1.3
MW-C4.3
MW-A1.1
MW-A1.4
MW-C4.1
MW-C2.1
MW-C2.3
MW-C2.2
MW-C2.5
MW-C2.4
MW-C2.6
BNSF Railroad Track
#4
#1
#13
#12
Washougal River
Camas Slough

- Existing Monitoring Wells
- Production Wells with transducers

Proposed Monitoring Wells

- Proposed Monitoring Wells
- First Phase Monitoring Wells
- Area Inaccessible due to Ongoing Operations
- Operational Features
- Prevailing groundwater flow direction (SW)
- Possible seasonal variation in groundwater flow direction (SE)
- Areas inaccessible due to density of structures and below-grade features
- Mill Operational Areas

Notes:

1. All locations are approximate. Monitoring well and other sampling locations may change based on field observations and findings frcm utility locates completed in the field.

N

0 400 Feet

Proposed Monitoring Well Locations

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 14A
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: NA



- Existing Monitoring Wells
- Proposed Monitoring Wells
- Prevailing groundwater flow direction (SW)
- Radial perched groundwater flow direction

- Areas active and managed under applicable permits
- No historical or current activity associated with the Mill
- Operational Features
- Mill Operational Areas

Notes:

1. All locations are approximate. Monitoring well and other sampling locations may change based on field observations and findings frcm utility locates completed in the field.
2. Outfall 001 is the historical clarifier outfall and is the current treated effluent outfall.

N

0 700 Feet

Proposed Monitoring Well Locations
Lady Island

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 14B
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None || Basemap Service Layer Credits: NA

GIS Path: \\AS\Sea\01\Geosntec projects\Georgia Pacific\ GIP_RI_AS130290L\GIP_RI_AS130290L.aprx || Layout: 14b Proposed Monitoring Well Locations || User: Madeleine Peery || Print Date: 7/30/2025



- Proposed Shallow Soil Samples (2 sample depth intervals)
- Proposed Shallow Soil Samples (3 sample depth inervals)
- Proposed Surface Soil Samples (2 samples near this location)
- Proposed Test Pit Location (1 soil sample collected from bottom of test pit)
- Outfall
- Existing Monitoring Wells

Proposed Monitoring Wells

- Proposed Monitoring Wells
- First Phase Monitoring Wells
- Approximate Extent of Inert Solid Waste Landfill
- Areas inaccessible due to density of structures and below-grade features
- Area Inaccessible due to Ongoing Operations
- Operational Features
- Mill Operational Areas

Notes:

1. All locations are approximate. Monitoring well and other sampling locations may change based on field observations and findings from utility locates completed in the field.
2. A minimum of 2 soil samples will be collected and analyzed during boring activities associated with each monitoring well installation.
3. "Surface" indicates a soil sample at a Substation, where a sample will be collected from exposed surface soils using non-intrusive methods if the Substation is inactive. If soil is not exposed or the Substation is active, sample collection will be postponed until the substation is inactive.
4. "Shallow" indicates a shallow soil sample is proposed. Invasive sampling methods will be used to collect a sample from soils within 0-1 feet below ground surface.

N

0 400 Feet

Proposed Shallow Soil Sampling Locations

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 15
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA

GIS Path: \\GSP-Sea-01\Geodata\Projects\Georgia Pacific\GDP_RI_AS130290L\GDP_RI_AS130290L.aprx::15 Proposed Soil Sampling Locations | | User: Madeline.Perry | | Print Date: 7/11/2025



Notes:

1. All locations are approximate. Monitoring well and other sampling locations may change based on field observations and findings from utility locates completed in the field.
2. Dredge spoils are owned by the Army Corps. of Engineers.
3. "Surface" indicates a soil sample at a Substation, where a sample will be collected from exposed surface soils using non-intrusive methods if the Substation is inactive. If soil is not exposed or the Substation is active, sample collection will be postponed until the substation is inactive.
4. "Ditch Bottom Material" indicates a soil sample will be collected from the material 0 to 6 inches below the observed transition from material used to backfill ditches to ditch bottom material.
5. "Shallow" indicates a shallow soil sample is proposed. Invasive sampling methods will be used to collect a sample from soils within 0-1 feet below ground surface.
6. Outfall 001 is the historical clarifier outfall and is the current treated effluent outfall.

- Proposed Surface Soil Samples (2 samples near this location)
- Proposed Ditch Bottom Material Soil Samples
- Proposed Shallow Soil Samples (2 samples near this location)
- Outfall
- Existing Monitoring Wells
- Proposed Monitoring Wells
- Areas active and managed under applicable permits
- No historical or current activity associated with the Mill
- Areas inaccessible due to density of structures and below-grade features
- Operational Features
- Mill Operational Areas

N

0 700 Feet

Lady Island Wastewater Ditch Sample Locations

Remedial Investigation Work Plan
Georgia Pacific Consumer Services
Camas, Washington

Geosyntec consultants	JUL-2025	BY: IVT / RAP	FIGURE NO. 16
	PROJECT NO. AS130290L	REVISED BY: ---/---	

Data source credits: None | | Basemap Service Layer Credits: NA

GIS Path: \\AGP-Sea-01\Geodata\Projects\Georgia Pacific\GDP_RI_AS130290L\GDP_RI_AS130290L.aprx:16 Lady Island Wastewater Ditch Sample Locations | | User: Madeline Peery | | Print Date: 7/10/2025

Geosyntec consultants

APPENDIX A
Sampling and Analysis Plan

Geosyntec consultants

engineers | scientists | innovators

SAMPLING AND ANALYSIS PLAN / QUALITY ASSURANCE PROJECT PLAN

Georgia-Pacific Consumer Products, Camas, Washington

Prepared for

Georgia-Pacific Consumer Operations LLC
401 NE Adams Street
Camas, Washington 98607

Prepared by
Geosyntec Consultants, Inc.
920 SW Sixth Avenue, Suite 600
Portland, Oregon 97204

Project: AS130290L

4 August 2025

Cleanup Site ID 15156
Agency Review Revised Draft (v. 4)

Geosyntec consultants

QUALITY ASSURANCE PROJECT PLAN
Signature Page

Site: Georgia-Pacific Consumer Products
Camas, Washington

Address: 401 NE Adams Street, Camas, Washington 98607

Document Date: 4 August 2025

Signature below indicates review and approval of the Quality Assurance Project Plan and agreement that the anticipated sampling and analytical methods are sufficient to meet the quality objectives of the Georgia-Pacific Consumer Operations LLC Site.

Washington State Department of Ecology

Mady Lyon — Date
Ecology Project Coordinator

Georgia-Pacific Project Manager

Matt Tiller — Date
Project Coordinator

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Appendix A-1: Health and Safety Plan (HASP)

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
AO	Agreed Order No. DE 18201
ARAR	applicable, relevant, and appropriate requirement
ASTM	ASTM International
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CFR	Code of Federal Regulations
COPC	chemical of potential concern
DI	distilled/deionized
DOT	Department of Transportation
DQO	data quality objective
Ecology	Washington State Department of Ecology
EDD	electronic data deliverables
EIM	Environmental Information Management System
GP	Georgia-Pacific Consumer Operations LLC
HASP	health and safety plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDW	investigation-derived waste
MDL	method detection limit
mL/min	milliliters per minute
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
MTBE	methyl tert-butyl ether
MTCA	Model Toxics Control Act

NWTPH-Dx	Northwest Total Petroleum Hydrocarbons as Diesel and Oil Extended
NWTPH-Gx	Northwest Total Petroleum Hydrocarbons as Gasoline Extended
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
PCDD/PCDF	polychlorinated dibenzodioxin and polychlorinated dibenzofuran compounds (also referred to as “dioxins/furans”)
PDB	Passive Diffusion Bag
PFAS	per- & polyfluoroalkyl substances
PID	photoionization detector
PM	Project Manager
PPE	personal protective equipment
PQL	practical quantitation limit
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RI	remedial investigation
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SVOC	semivolatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency

USGS	United States Geological Survey
VOC	volatile organic compound
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WP	Work Plan

1. INTRODUCTION

This Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP) documents the sampling procedures and protocols for the remedial investigation (RI) at the Georgia-Pacific Consumer Operations LLC (GP) property located at 401 NE Adams Street, Camas, Washington ("the Mill Property" or "the Mill"). This SAP/QAPP is also intended to satisfy the technical requirements of the Washington Administrative Code (WAC) 173-340-820, the Washington State Department of Ecology's (Ecology) *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Ecology 2004), and other Ecology policies and/or procedures. This work is being performed pursuant to an Agreed Order (AO) number DE 18201) between Ecology and GP dated 12 August 2021. This SAP/QAPP is Appendix A of the Fourth Draft Upland RI Work Plan (WP)[1].

The purpose of this SAP/QAPP is to describe sample collection, handling, and analysis procedures, including quality assurance and quality control (QA/QC) requirements. This SAP/QAPP is intended to be used in conjunction with other site-specific project documents, including the Fourth Draft Upland RI WP (the RI WP), which has been prepared separately and describes detailed background information, sampling locations, and analyses.

Specific information required by WAC 173-340-820 for this SAP/QAPP includes the following:

- Purpose and objectives of the data collection, including QA/QC. The purpose and objective for data collection is presented in more detail in Section 1 of the Fourth Draft Upland RI WP.
- Organization and responsibilities for sampling and analysis activities. Project management roles and responsibilities are presented in Table A-1.
- Requirements for sampling activities, which include the following:
  - Project schedule. This is presented in Section 1 of the Fourth Draft Upland RI WP.
  - Rationale for location and frequency of sampling and parameters to be analyzed. This is presented in the Fourth Draft Upland RI WP.

[1] The Agency Review Draft RI WP was submitted to Ecology on 3 January 2022 ("First Draft Upland RI WP"; Kennedy Jenks 2022). Ecology provided comments on the First Draft Upland RI WP on 4 November 2022 (Ecology 2022b). GP provided responses in a Response to Comment (RTC) letter dated 3 February 2023 (GRES 2023) and submitted the Agency Review Revised Upland Draft RI WP to Ecology on 31 March 2023 ("Second Draft Upland RI WP"; Kennedy Jenks 2023). Ecology provided comments on the Second Draft Upland RI WP on 30 November 2023 (Ecology 2023). Ecology comments, comments provided by the Yakama Nation, and preliminary GP responses were discussed in a meeting with Ecology and representatives of the Yakama Nation on 29 February 2024. GP provided responses in a RTC letter dated 19 March 2024 (GRES 2024) and submitted the Agency Review Revised Draft RI WP for Upland Areas to Ecology on 14 June 2024 ("Third Draft Upland RI WP"; Kennedy Jenks 2024), which included a revised SAP/QAPP. Ecology provided comments on the Third Draft Upland RI WP on 26 March 2025 (Ecology 2025). Ecology comments and comments provided by the Yakama Nation were reviewed and considered to prepare a revised Draft Upland RI WP for Upland Areas ("Fourth Draft Upland RI WP") and this SAP/QAPP. The Fourth Draft Upland RI WP and SAP/QAPP were revised by Geosyntec Consultants, Inc. for GP.

  - Procedures for sample collection and handling, including decontamination for equipment and personnel.
  - Procedures for management of waste materials generated by sampling activities.
  - Description of QA/QC samples.
  - Sample labeling, packaging, and chain-of-custody protocols.
- Procedures for sample analyses and reporting including analytical laboratory detection/reporting limits, analytical methods, QA/QC procedures, data reporting, and data validation.

This SAP/QAPP and the attached Health and Safety Plan (HASP) may be amended if additional activities not covered in this SAP/QAPP are necessary in the future.

1.1 Background

The Mill Property is in southwestern Washington along the banks of the Camas Slough and Columbia River in the city of Camas. It occupies approximately 661 total acres, of which 476 acres is on Lady Island and 185 acres is on the upland side of the Camas Slough. Washington State Route 14 travels east-west through Lady Island.

Operation of the Mill began in 1883 under the Columbia River Paper Company. Mill Property ownership and use has changed over time; currently, it is owned and operated by GP. Additional background information of the Mill Property, including operational history and previous investigations, is presented in more detail in the RI WP.

In November 2017, GP announced that it planned to shut down multiple operations at the Mill Property, including the communication paper machine, fine paper converting assets, pulping operations, and related equipment. The shutdown of these areas was officially complete in mid-2019. The Mill continues to produce paper products, including tissue paper and paper towels, from purchased pulp (Brynelson 2017).

1.2 Purpose and Objective of the Data Collection

The purpose of the RI is to collect and evaluate data of known quality which are sufficient to understand Mill Property conditions and address initial data gaps. The data will be used to select a cleanup under WAC 173-340-360 through 173-340-390. The purpose and objectives of the data collection are described in the RI WP.

As acknowledged in the AO, there are areas of the Mill Property with ongoing operations that may be inaccessible and will not allow complete investigation, characterization, or cleanup actions at this time. Investigation, characterization, and cleanup of these areas will be deferred until they become accessible. At that time, a separate RI WP will be submitted to Ecology, and this SAP/QAPP will be amended as necessary.

The types of field activities addressed by this SAP/QAPP generally include

- a utility survey,

- drilling,
- soil sampling,
- monitoring well installation,
- groundwater sampling and water level measurements,
- documentation of field activities, and
- an analysis of environmental samples.

Field activities are described in more detail in the RI WP. Sampling tasks should follow the QA/QC requirements set forth in this SAP/QAPP, unless otherwise specified.

1.3 Health and Safety Plan

Geosyntec has prepared a HASP (Appendix A-1) which describes health and safety measures to be followed during the site investigation. Subcontractors providing support during sampling will be required to maintain their own HASP documenting their health and safety procedures.

Personnel, including subcontractors, must obtain the proper training to recognize and protect themselves from hazardous chemicals known or suspected to be present at the Mill Property. Field personnel are required to have appropriate Occupational Safety and Health Administration (OSHA) health and safety training for hazardous waste sites per 29 Code of Federal Regulations (CFR) 1910.120, supplemented by annual refresher courses. Environmental consultants are responsible for confirming that their personnel are informed about and trained on relevant OSHA and Washington Industrial Safety and Health Act (WISHA) guidelines.

Visitors are required to complete Camas Mill Contractor Orientation training prior to commencing work on the Mill Property. Copies of training certificates are to be presented to the Clock Room at the first site visit and emailed to the GP Project Manager in advance of field work.

1.4 Document Organization

The remainder of this document is organized as follows:

- Section 2: Project Organization
- Section 3: Field Sampling Activities
- Section 4: Field Documentation
- Section 5: Data Quality Objectives
- Section 6: Quality Control
- Section 7: Documentation/Data Management
- Section 8: Data Reduction, Review, Verification and Validation
- Section 9: References

The SAP (Sections 3 and 4) describes the field investigation methods to be used for the collection of environmental samples (primarily groundwater and soil samples), identifies the proposed number and locations of samples, defines field protocols for collection samples, and identifies the chemical and physical testing suite. The QAPP (Sections 5 through 8) defines analytical laboratory methods and field and lab quality assurance (QA) protocols for these samples for the completion of the RI WP.

2. PROJECT ORGANIZATION

This section identifies the project team members and other key personnel participating in the project and describes their specific roles, responsibilities, and qualifications.

On behalf of GP, Geosyntec will serve as the prime consultant for this RI. The key project personnel and responsibilities are listed in Table A-1. Anticipated subcontractors include drillers and laboratory services, at a minimum. The analytical laboratory(s) selected to analyze samples for this project will meet the accreditation standards in chapter 173-50 WAC.

The field team is responsible for conducting field activities according to the SAP and for communicating with the Field Team Leader, who will communicate with the Project Manager (PM). The Field Team Leader will coordinate with a Washington-licensed well driller.

The analytical laboratory is responsible for conducting activities according to the accreditation standards established in chapter 173-50 WAC, the SAP, and the RI WP. Laboratories are responsible for maintaining sample custody records throughout processing and analysis, conducting analyses according to specified standard operating procedures (SOPs), reviewing QC data and implementing corrective action, as appropriate, and contacting the Project Laboratory Manager to communicate issues that could affect sample integrity, data quality, or schedule. The laboratory is responsible for appointing an independent QA Officer who will monitor the study, conduct laboratory inspections and data audits, and report findings to management. Laboratory certifications will be acquired prior to initiating specific scopes of work.

2.1 Special Training / Certification

Most of the activities included in this RI involve routine sampling and analyses with no special training requirements and certifications needed. Staff working on site will have completed the OSHA's required Hazardous Waste Operations and Emergency Response (HAZWOPER) 40-hour training and will also have currently (within the past year) completed the OSHA/HAZWOPER 8-hour annual refresher health and safety training. Site visitors are required to complete Camas Mill Contractor Orientation training prior to commencing work on the Mill Property. Health and safety training records for Geosyntec personnel will be maintained in the project files.

Prior to the start of the investigation, field personnel will be given instruction specific to the project, covering the following areas:

- Organization and lines of communication and authority
- Overview of the SAP (i.e., sample collection, handling, and labeling procedures)
- QA/QC requirements
- Documentation requirements
- Health and safety requirements

Instructions will be provided by the PM or Field Team Leader.

2.2 Schedule

The project schedule, including milestones such as field sampling and reporting, is documented in the RI WP.

3. FIELD SAMPLING ACTIVITIES

This section describes anticipated field activities pertaining to the site investigation, including sampling procedures, sample identification, decontamination, and waste disposal. Specific sampling methodologies for various sample types are described in detail in the SOPs provided in Appendix A-2 and referenced below where applicable[2]. The following SOPs will guide sampling activities:

- SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures
- SOP-2: Using a Photoionization Detector (PID)
- SOP-3: Borehole Logging
- SOP-4: Soil Sampling
- SOP-5: Well Construction and Development
- SOP-6: Measuring Groundwater Levels
- SOP-7: Groundwater Sampling
- SOP-8: Measurement of Water Quality Parameters
- SOP-9: Collecting Field Duplicates
- SOP-10: Sample Packing and Shipping
- SOP-11: Equipment Decontamination and Rinsate Blanks
- SOP-12: Personnel Decontamination
- SOP-13: Handling and Disposal of Investigation-Derived Waste
- SOP-14: Sampling for Per- & Polyfluoroalkyl Substances (PFAS)

The SOPs identified above are generic and intended to be suitable for a variety of site conditions. There may be additional requirements for specific chemicals (e.g., PFAS). These additional, specific requirements will be covered in an SOP in this SAP/QAPP, and/or in the RI WP. It is anticipated that the specific procedures in the SOP will be modified in the field as needed to address site-specific conditions, and as described below. Deviations from the SOPs identified above will be documented in the field notes.

3.1 Utility Locating

Prior to the subsurface investigation, GP's consultant will coordinate the location of underground utilities adjacent to the sampling locations. The appropriate service (Northwest Utility Notification Center) will be contacted to locate publicly owned underground utilities before intrusive activities occur. In addition, underground utilities will be evaluated by reviewing as-built drawings of

[2] As described in the RI WP, sediment sample collection is not proposed at this time. If sediment sampling is proposed, this SAP/QAPP will be amended to include sediment sampling methodologies and follow Ecology's *Sediment Sampling and Analysis Plan Appendix* (Ecology 2008).

underground site utilities provided by GP and by procuring a private utility location company to locate possible underground utilities and features at subsurface investigation locations. Additional procedures for underground utility location are described in the HASP and in SOP-4: Soil Sampling.

3.2 Sampling Locations

Soil and groundwater samples will be collected for laboratory analysis from groundwater monitoring wells and/or soil sampling locations. Sampling depths will vary across the Mill Property based on depth to observed impacts and groundwater. Additional information on sample locations and rationale is presented in the RI WP.

3.3 Sampling Frequency

Soil samples will be collected for laboratory analysis at a frequency defined in the RI WP. Some soil samples retained for analysis may not be analyzed, and some borings may be sampled at alternate frequency as described in the RI WP.

Groundwater samples will be collected from monitoring wells at least 1 week following development. After the initial sampling event, groundwater samples will be collected using the same methods at a frequency defined in the RI WP or subsequent document describing the purpose of the well and associated data collection.

3.4 Sampling Procedures

Samples will be collected in a manner consistent with the media being sampled and the analytes of interest. Sampling procedures will be carried out following the SOPs listed at the beginning of this section and provided in Appendix A-2. Specific sampling methods for media of interest are discussed in greater detail in the following sections.

Some sources for the appropriate sampling methods include, but are not limited to, the following:

- ASTM International. 1999. Designation: D 6452 – 99. Standard Guide for Purging Methods for Wells Used for Ground-Water Quality Investigations. Copyright ASTM, West Conshocken, PA.
- ASTM International. 2002. Designation D 6771 – 02. Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations. Copyright ASTM International, West Conshocken, PA.
- ASTM International. 2009. Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), D2488-09a.
- ASTM International. 2015. Standard Practice for Collection and Handling of Soils Obtained in Core Barrel Samplers for Environmental Investigations, D6640-01.
- Ecology. 2023. Guidance for Investigating and Remediation PFAS Contamination in Washington State. Publication Number 22-09-058. June.
- Interstate Technology Regulatory Council [ITRC]. 2025. PFAS Sampling and Analysis. Accessed 26 March 2025.

- Michigan Department of Environment, Great Lakes, and Energy [EGLE]. 2024. General PFAS Sampling Guidance. January.
- United States Environmental Protection Agency (USEPA). 2001. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM). Dated November 2001. USEPA Region 4.
- Vroblesky, Dan A. 2001. U.S. Geological Survey, User's Guide for Polyethylene Based Passive Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells. Part 1: Deployment, Recovery, Data Interpretation, and Quality Control and Assurance. Water-Resources Investigations Report 01-4060. Columbia, South Carolina.

The use of proper sample containers and appropriate preservation techniques when collecting samples is important. Samples will be collected in containers supplied by the analytical laboratory. Laboratory-provided containers will have been properly cleaned and be of a suitable size and material to provide the analytical laboratory with sufficient sample material to conduct the requested test. Samples will also be properly preserved, or they may be rejected.

Table A-2 summarizes common sample containers, preservation techniques, and holding times for the requested analytes. Sampling containers, analytical methods, preservatives and holding times may be modified as required by the selected analytical laboratory. Specific sampling methods for media of interest are discussed in greater detail in the following sections.

3.4.1 Soil Sampling

Soil sample collection methods are described in the RI WP, SOP-4: Soil Sampling (Appendix A-2). Field screening and logging of soils from boring activities will be conducted by a field geologist. Field screening of soil materials will include the following:

- Visual observation of staining and other discoloration
- Olfactory observation of petroleum hydrocarbons and other odors
- Water-sheen testing for the presence of hydrocarbon or other sheen/film
- Headspace analysis for organic vapors using a portable PID and headspace technique in accordance with SOP-2: Using a Photoionization Detector (Appendix A-2)

Soils will also be logged in general accordance with the United Soil Classification System and as described in SOP-3: Borehole Logging (Appendix A-2).

Soil samples will be collected from borings at target intervals, as described in the RI WP. Soil samples will be collected as discrete samples by standard grab methods as described in the referenced SOPs and should contain as few cobbles or stones as possible. Samples will be collected in laboratory-provided sample containers as specified in Table A-2. Soil samples will be packaged and handled in accordance with SOP-10: Sample Packing and Shipping provided in Appendix A-2.

3.4.2 Monitoring Well Installation

Monitoring wells will be drilled and installed at locations as described in the RI WP. Soil from monitoring well borings may be logged and sampled as described in Section 3.4.1. Monitoring wells will be constructed and developed in accordance with SOP-5: Well Construction and Development.

3.4.3 Water Level Monitoring

At the beginning of groundwater sample collection events, a water level measurement will be collected from each monitoring well. Water levels will be measured in accordance with SOP-6: Measuring Groundwater Levels (Appendix A-2).

Groundwater may be influenced by the site's proximity to the Columbia River. Water level measurements from monitoring wells will be compared to the river stage to monitor for impacts, if any. The following river stations will be used:

- United States Geological Survey (USGS) Station 14144700 at Vancouver[3], which is approximately 13 miles downstream of the Mill Property
- USGS Station 14128870 at Bonneville Dam[4], which is approximately 24 miles upstream of the Mill Property (on downstream side of Bonneville Dam).

3.4.4 Groundwater Sampling

Groundwater sample collection methods are described in the RI WP and SOP-7: Groundwater Sampling and SOP-14: Sampling for Per- and Polyfluoroalkyl Substances (PFAS) (Appendix A-2). Grab groundwater samples will be collected from monitoring wells and may be collected from borings, if encountered. Grab groundwater sampling from borings will consist of collecting a groundwater sample from the uppermost saturated zone without installing a permanent monitoring well and without purging. It is expected that grab groundwater samples may be collected using clean, PFAS-free disposable tubing connected to a peristaltic pump. After a grab groundwater sample is collected, it will be transferred to the appropriate sample containers in accordance with the SOPs listed above and packaged and handled in accordance with SOP-10: Sample Packing and Shipping.

Prior to collecting samples, water quality field parameters will be collected in accordance with SOP-8: Measurement of Water Quality Parameters (Appendix A-2). Field parameter measurements will be obtained using a Yellow Springs Instrument (YSI meter) or equivalent. A turbidity meter or equivalent will also be used to collect turbidity measurements, and a pH meter or equivalent will be used to collect pH measurements. Meter readings will be recorded at regular intervals (typically 5- to 10-minute intervals) during the purging process, and a final reading will be taken at the completion of purging for each well location. Purging will continue until stabilization criteria, per the above listed SOPs, for each parameter have been met.

[3] https://waterdata.usgs.gov/monitoring-location/14144700/#parameterCode=00065&period=P7D
[4] https://waterdata.usgs.gov/monitoring-location/14128870/#parameterCode=00065&period=P7D

Following field measurements, groundwater samples will be collected via low-flow purging and sampling procedures and in accordance with the SOPs listed above. Purge rates during groundwater sampling will be kept at or below approximately 200 milliliters per minute (mL/min) (i.e., low-flow) to reduce potential influence of turbidity on samples. Samples will be collected in laboratory-provided sample containers as specified in Table A-2.

Samples may also be collected using no-purge methods (e.g., passive diffusion bags [PDBs]) or HydraSleeves. Sampling procedures for no-purge methods are also described in SOP-7: Groundwater Sampling.

3.5 Parameters

Soil and groundwater samples will be analyzed for chemicals of potential concern (COPCs) per the RI WP. Samples at selected locations will be analyzed for the following compounds: polychlorinated dibenzodioxin and polychlorinated dibenzofuran compounds (PCDDs/PCDFs or dioxins/furans), metals, PFAS, benzene/toluene/ethylbenzene/xylene (BTEX), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), sulfur (sulfate and sulfide), total organic carbon (TOC), and general chemistry parameters outlined in Table A-2. Speciated compounds to be analyzed and their respective method reporting limits and applicable screening levels are listed in Table A-5[5]. Additional information on COPCs in each operational area are found in Section 3 of the RI WP.

The order of sample collection, regardless of the matrix, will generally start with analytes most sensitive to bias (e.g., PFAS) and then from the most volatile to the least volatile, as shown below:

- PFAS
- VOCs[6] (including PCE, TCE, 1,1,1-trichloroethane, 1,1-dichloroethene, 1,2-dibromoethane, cis-1,2-DCE, and methyl tert-butyl ether [MTBE])
- BTEX
- SVOCs (including naphthalene, diphenyl, and polycyclic aromatic hydrocarbons [PAHs])
- Northwest Total Petroleum Hydrocarbons as Gasoline Extended (NWTPH-Gx), and as Diesel and Oil Extended (NWTPH Dx)
- Pesticides (dimethyl sulfoxide [DMSO])
- PCBs
- PCDDs/PCDFs
- Metals

[5] Reporting limits provided in Table A-5 were provided by Eurofins in March 2023. If a different laboratory is used, reporting limits will be requested from that laboratory

[6] Ecology Draft PFAS Guidance recommends collecting VOC samples before PFAS samples if collecting solids samples (Ecology 2022c).

- TOC
- Sulfur (sulfide and sulfate)

3.6 Sample Identification

To clearly associate a sample with sampling location and date, samples will be identified with a unique sample location identification. Sample names will generally include location code, sample depth (as appropriate), sample date, and matrix. Naming conventions for groundwater samples, soil samples, field duplicates, equipment-rinsate blanks, and field blanks are outlined in Table A-4. The procedures for sample identification are presented in SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures.

3.7 Sample Handling and Custody

The procedures for sample handling are presented in SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures.

To verify the integrity of field samples, specific steps will be taken to avoid cross-contamination from containers in which the samples are stored. Sample containers will be compatible with the analyte(s) of interest. Sample containers required for collection of analytical samples for the RI are summarized in Table A-2.

The purpose of sample preservation is to avoid or slow the degradation or transformation of target analytes in the field samples during transport and storage. Preservation efforts for sample integrity will be initiated at the time of sampling and will continue until the analyses are performed. Samples for chemical analysis will be packaged and stored in an appropriate manner consistent with preservation requirements for each test method.

Immediately following sample collection, the groundwater or soil samples will be capped, labeled, sealed in plastic bags, and placed into an insulated cooler maintained at a temperature between 1 and 4 degrees Celsius (°C) using gel packs or wet ice sealed in a plastic bag. Each cooler will be packed in a manner that will prevent damage to sample containers during transport to the laboratory. Samples will be transported directly or shipped to the analytical laboratory within a time frame appropriate for the sample media and selected analysis under chain-of-custody protocol in accordance with SOP-10: Sample Packaging and Shipping and SOP-14: Sampling for Per- & Polyfluoralkyl Substances (PFAS), provided in Appendix A-2.

3.8 Equipment Decontamination

To the greatest extent possible, disposable and/or dedicated personal protective and sampling equipment will be used to avoid cross-contamination. Nondisposable sampling equipment will be cleaned between sample locations to avoid cross-contamination in accordance with procedures described in SOP-11: Equipment Decontamination and Rinsate Blanks. To the extent possible, sampling using nondisposable sampling equipment will begin at locations suspected to be least affected by target chemicals, progressing to the locations suspected of being most affected.

Fieldwork will be conducted according to the site-specific HASP using Level “D” personal protective equipment (PPE). In accordance with the decontamination procedures described in

SOP-12: Personnel Decontamination, disposable PPE and equipment will be placed in appropriate disposal containers.

3.9 Investigation-Derived Waste Management

Investigation-derived waste (IDW) may be generated during the Camas Mill Site investigation. Generally, due to their relatively small quantities, generated IDW such as disposable sampling equipment and protective clothing (e.g., gloves) can be disposed of at a state-permitted, licensed, or registered municipal or industrial solid waste landfill. Otherwise, IDW may include contaminated soil, water, used PPE, and decontamination water that remains after sampling. IDW will be stored in new or reconditioned, Department of Transportation (DOT)-approved, 55- or 30-gallon drums pending characterization and off-site disposal. They will be stored within a secured location on the Mill Property in accordance with Mill's waste handling program.

The environmental consultant will be responsible for waste management at the site, which includes containerizing and securing the IDW and labeling, staging, and profiling the IDW for ultimate disposal within a timely manner and in accordance with SOP-13: Handling and Disposal of Investigation-Derived Waste. IDW drums will be placed in a configuration that allows room for inspections, operations and maintenance, and handling. Each drum will include a label with the following information: contents, name of generator, and date.

IDW will be characterized using the results of the investigation samples. Each IDW container will be referenced to a set of analytical (sample) data that is representative of the IDW. Before receipt of analytical data, IDW will be preliminarily characterized based on site knowledge, field observations, and field analytical data (typically hazardous vs. nonhazardous) or marked "pending analysis." Final IDW classification/characterization will be based on analytical data for investigation and/or waste characterization samples.

IDW will be disposed of promptly after characterization is performed. The IDW characterization process is outlined in USEPA's *Management of Investigation-Derived Wastes During Site Inspections* (USEPA 1991) and USEPA's *Guide to Management of Investigation-Derived Wastes* (USEPA 1992). Classification of IDW will also follow the regulations published in Dangerous Waste Regulations (WAC 173-303) on the basis of the laboratory analyses. IDW will also be evaluated as required by WAC 173-303-100 State Only Dangerous Waste. Once the IDW is characterized, the environmental consultant will document the proper management and/or disposal. IDW will be disposed of no more than 60 days from the end of the fieldwork activities.

3.10 Field Equipment Calibration and Maintenance

Non-analytical instruments will be maintained in accordance with manufacturers' specifications and calibration information will be recorded on field calibration sheets on a daily basis.

Examples of field equipment subject to calibration include

- air-monitoring equipment (PIDs),
- water quality meter (e.g., YSI or equivalent),
- turbidity meter,

- pH meter
- water-level monitoring meter, and
- field scale.

Calibration of the equipment will be in accordance with the equipment's operations manual and as presented in Table A-3.

Field instruments and equipment used for sample analysis will be serviced and maintained only by qualified personnel. For rented equipment, repairs, adjustments, routine maintenance, and calibrations will be documented in an appropriate logbook or data sheet that will be kept on file by the environmental consultant. The instrument maintenance and calibration records will clearly document the date, describe the maintenance conducted, note corrective actions and the result (if taken), and name who performed the work.

4. FIELD DOCUMENTATION

Careful sample documentation and custody procedures will be used to correctly identify and track samples and to maintain sample integrity during collection, transport, storage, and analysis.

Field sampling personnel will be responsible for maintaining proper documentation and custody procedures from sample collection until samples are transferred to the analytical laboratory or a commercial freight carrier. The environmental consultant will review and approve field documentation. The analytical laboratory will be responsible for maintaining sample custody and documentation from the time the analytical laboratory receives the samples until final sample disposal. Field documentation and sample chain-of-custody requirements are discussed below.

4.1 Documentation of Field Activities

The procedures for field documentation are presented in SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures. A field logbook will be maintained by the sampling team. Field logbooks will be composed of waterproof pages in bound notebooks, unless waterproof materials are inconsistent with the planned analysis (i.e., PFAS), or electronic files are created using electronic field data collection tools. Allowable materials for field documentation to reduce risk of PFAS cross-contamination are summarized in SOP-14: Sampling for Per- & Polyfluoroalkyl Substances (PFAS) in Appendix A-2.

Entries to field logbooks, and other field documentation, will be made using indelible ink. Errors will be corrected by drawing a single line through the incorrect entry, entering the correct information, and dating and initialing the change. After project completion, field logbooks will be stored in the final project file.

Daily entries into the logbook or electronic files will generally include the following information:

- Date
- Sampler name
- Personnel on-site (including visitors)
- Weather conditions
- Type(s) of field equipment used
- Field equipment calibration methods (if applicable)
- Sample location and depth (locations to be logged using GPS), including description of sample location
- Sample collection method, including any deviations from this SAP/QAPP
- Date and time of sample collection
- Field observations and field measurements made
- Sample identification number(s)
- Sample type (e.g., duplicates)

- Sample preservation
- Photographs (including general field activities, soil borings, and sample locations)
- Documentation for IDW (e.g., contents and approximate volume of waste, disposal method)
- Issues encountered and/or corrective actions
- Deviations from this SAP/QAPP
- Other observations that may be relevant to the specific field program or activities that may affect the resulting analytical data

Information recorded on field forms (i.e., boring logs, purge forms, sample data sheets, etc.) need not be duplicated in the field logbook. Where practical, photographs will be taken to document field activities.

4.2 Field Forms

Field sampling personnel may complete field sample forms for soil and groundwater. As previously noted, data entered on field forms does not need to be duplicated in the field logbook.

4.3 Field Chain-of-Custody Procedures

The chain-of-custody procedures are presented in SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures. Each sample collected will be given a unique sample number that appears on labels affixed to the appropriate sample containers. Sample identification numbers will also be included on the chain-of-custody form to accompany each sample shipment submitted for laboratory analysis. Field sampling personnel will be responsible for uniquely identifying, labeling, and packaging samples to preclude breakage during shipment.

Samples will be placed immediately in appropriate containers with appropriate preservatives per the analytical method requirements (see Table A-2). The filled containers will be tightly sealed, the outer surface wiped to remove any loose particulates and stored in a dedicated cooler with ice (or ice packs) pending transport to the analytical laboratory.

Samples will be labeled with the following information:

- Consultant's name
- Project name/location
- Sample identification number
- Date and time of sample collection
- Preservative (if applicable)
- Analyses to be performed
- Sample matrix (i.e., water)
- Sampler's name or initials

Chain-of-custody records document the handling of each sample from the time of its collection to its destruction. The environmental consultant will initiate custody of the samples in the field and, in turn, transfer custody of the samples to the courier (as needed), and lastly to the laboratory. chain-of-custody forms will be used for recording pertinent information about the types and numbers of samples collected and shipped for analysis.

Each chain-of-custody form will be completed properly to document sample custody, confirm samples have been collected, and assign intended analyses. Entries will be made using indelible ink. Errors will be corrected by drawing a single line through the incorrect entry, entering the correct information, and then initialing and dating the change. Analytical laboratories typically provide a chain-of-custody form that they prefer. At a minimum, these forms will contain the following information:

- Sample identification
- Date and time of sample collection
- Sample matrix (i.e., soil, water)
- Number and type of containers per sample
- Preservative (if applicable)
- Analyses to be performed
- Sampler's name and initials
- Release and acceptance information, including date, location, and sampler's signature

Custody seals will be used when samples are shipped to the analytical laboratory, or when they are delivered to the analytical laboratory after hours. The seals will be signed by the field personnel and be affixed to the sample cooler in a way that would necessitate breaking the seal in order to open the cooler. If the samples are delivered directly to the analytical laboratory by the sampler, sample seals are not necessary.

If the samples are shipped via a commercial carrier, the carrier will relinquish samples to the analytical laboratory upon arrival, and the analytical laboratory personnel will complete the chain-of-custody form. The chain-of-custody forms will be placed in self-sealing plastic bags (or similar) and secured to the top of the lid inside the cooler with tape.

4.4 Analytical Laboratory Chain-of-Custody Procedures

A signed chain-of-custody form will be obtained from the analytical laboratory custodian after the samples have been received and sample condition recorded. Upon receipt by the analytical laboratory, samples will be checked carefully to confirm that sample containers are not broken or leaking, proper preservation methods have been followed (including receipt at less than 4°C (± 2°C) for aqueous samples and less than or equal to 6°C but not frozen for organics when applicable), and labels and custody seals are intact. Each chain-of-custody form will be verified for accuracy and completeness, and discrepancies will be brought to the attention of the environmental consultant. From the time of receipt, the analytical laboratory will use its standard

internal chain-of-custody procedures to track samples through completion of the analytical process.

Sample custody will be maintained within the analytical laboratory's secure facility until disposal. Following sample analysis and throughout the holding time, the analytical laboratory will archive remaining sample material for all samples (100 percent). The analytical laboratory will be responsible for sample disposal, which will be conducted in accordance with applicable local, state, and federal regulations.

5. DATA QUALITY OBJECTIVES

The data quality objectives (DQOs) for this project are to describe and implement field and laboratory procedures to provide data that are: (1) representative of actual environmental conditions, and (2) of known and acceptable quality. Measurements will be made to yield accurate and precise results representative of the media and conditions measured. Data will be calculated and reported in units consistent with those used by regulatory agencies to allow for comparability of data.

Accuracy, precision, completeness, representativeness, comparability, and sensitivity are terms used to describe the quality of analytical data. Routine procedures for measuring precision and accuracy include use of quality control samples (i.e., replicate analyses, check or laboratory control samples, matrix spikes, and procedural blanks). These indicators of data quality are discussed below.

5.1 Precision

Precision is an appraisal of the reproducibility of a set of measurements. Precision can be better defined as the variability of a group of measurements compared to their average value. Variability for environmental monitoring programs contains both an analytical component and a field component.

Precision will be determined through the collection and analysis of field duplicates, and the analysis of laboratory duplicates, matrix spike/matrix spike duplicate (MS/MSD) and laboratory control sample/laboratory control sample duplicate (LCS/LCSD) samples for the work performed at the site. The overall precision of measurement data is a mixture of sampling and analytical factors. Sampling precision will be measured through the laboratory analysis of field duplicate samples. Laboratory precision will be measured through the analysis of laboratory duplicates, and MS/MSD and LCS/LCSD samples.

Precision will be determined from replicate samples and can be mathematically expressed as the relative percent difference (RPD) between replicate/duplicate sample results. RPD is calculated using the following equation:

$$RPD = \frac{C_1 - C_2}{\overline{C}} \; x\, 100$$

where:

C1 = First concentration value or recovery value measured for a variable

C2 = Second concentration value or recovery value measured for a variable

The frequency of the performance of matrix spike duplicate and laboratory duplicate samples, where applicable, is usually one per batch (which typically consists of up to 20 samples) for each sample matrix received.

Field duplicate samples will be submitted blind to the laboratory to assess field variability. Frequency of field duplicate samples is discussed in Section 7.1.1.

Precision quantities will be calculated for analyses with method reporting limits of the same order of magnitude and with detected concentrations greater than or equal to five times the method reporting limits. In instances where no criteria have been established (e.g., field duplicates), RPD project goals will be 50 percent for well-homogenized soil samples and 30 percent for water samples. For LCS/LSCDs and MS/MSDs, the RPD goals will be determined by the laboratory.

5.2 Accuracy and Bias

Accuracy refers to the degree of difference between measured or calculated values and the true value. The closer the numerical value of the measurement comes to the true value, or actual concentration, the more accurate the measurement. The converse of accuracy is bias, in which a systematic mechanism tends to consistently introduce errors in one direction or the other. Bias in environmental sampling can occur in one of three ways; these mechanisms and their associated diagnostic and management methods are as follows:

- High bias, which can stem from cross-contamination of sampling, packaging, or analytical equipment and materials. Cross-contamination is monitored through blank samples, such as equipment, field, trip, filter, and method blanks. These samples assess the potential for cross-contamination from, respectively, sampling equipment, ambient conditions, packaging and shipping procedures, field filters, and laboratory equipment. Data validation protocols described in Section 8.3 present a structured approach for data qualification based on blank samples.
- Low bias, which can stem from the dispersion and degradation of target analytes; an example is the volatilization of chlorinated solvents during field sampling. The effects of these mechanisms are difficult to quantify; however, sampling accuracy can be maximized by the adoption and adherence to a strict field QA program. Specifically, sampling procedures will be performed following standard protocols described in this SAP/QAPP; for example, eliminating headspace in sampling vials for VOCs will reduce the potential for dispersion of VOCs during sampling. Through regular review of field procedures, deficiencies will be documented and corrected in a timely manner.
- High or low bias, due to poor recoveries, poor calibration, or other system control problems. The effects of these mechanisms on analytical accuracy may be expressed as the percent recovery of an analyte that has been added to the environmental sample at a known concentration before analysis. Analytical accuracy in the laboratory will be determined through the analysis of LCSs, MS/MSDs, and surrogates (for organic methods). Surrogates are organic compounds with properties that are similar to the constituent(s) of interest; surrogates are used to measure individual sample recovery during analysis. As with blank samples, data validation protocols provide a structured formula for data qualification based on erroneously high or low analyte recoveries.

Accuracy, when potentially affected by high or low recoveries as described in the third bullet above, is presented as percent recovery (R) for a matrix spike sample and calculated as follows:

$$R = \frac{(SSR - SR)}{SA} * 100$$

where:

SSR = Spiked sample result

SR = Sample result

SA = Spike added

The following is used to calculate R for a laboratory control sample or reference material:

$$R = \frac{RM}{RC} * 100$$

where:

RM = Reference material result

RC = Known reference concentration

Results of matrix spike and laboratory control samples will be evaluated to the laboratory's control limits. Control limits will be provided by the laboratory. The laboratory will review the QC samples and surrogate standard recoveries for each analysis to confirm that internal QC data lie within the limits of acceptability. The laboratory will investigate suspect trends and take appropriate corrective actions.

Field blank samples and method blank samples will also be used to evaluate bias of the data. Results for field and method blanks can reflect systematic bias that results from contamination of samples during collection or analysis. Analytes detected in field or method blank samples will be evaluated as potential indicators of bias.

5.3 Representativeness

Representativeness is the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. This is a qualitative assessment and is addressed primarily in the sample design, through the selection of sampling sites, and procedures that reflect the project goals and environment being sampled. Sampling locations and methods for selection of those sampling locations are described in the RI WP. Representativeness is accomplished in the laboratory through (1) the proper handling, homogenizing, compositing, and storage of samples, and (2) analysis within the specified holding times so that the material analyzed reflects the material collected as accurately as possible.

5.4 Completeness

Completeness is defined as a measure of the amount (percentage) of valid data obtained from a measurement system (field or laboratory) compared to the amount expected from the system.

The percent completeness for each set of samples will be calculated as follows:

$$\%\ Completeness\ = \frac{Valid\ Data}{Total\ Data\ Planned} \times\ 100$$

A target of 90 percent completeness for field and laboratory data is the expected minimum for this project. Less than 100 percent may be a result of sample matrix issues, loss of sample, data rejected via validation, or inability to collect all planned sample points.

5.5 Comparability

Comparability is a qualitative QA criterion that expresses confidence in the ability to compare one data set with another data set measuring the same property. Comparability is ensured through use of established and approved analytical methods, consistency in the basis of analysis (wet weight, volume, etc.), consistency in reporting units (e.g., milligrams per liter [mg/L]), and analysis of standard reference materials. By using standard sampling and analytical procedures, data sets will be comparable. Sampling procedures will be performed as specified in this SAP. Analytical procedures will be conducted according to the methods discussed in this QAPP, and comparability will be assessed through analytical performance (QC samples).

5.6 Sensitivity

Sensitivity refers to the minimum magnitude at which analytical methods can resolve quantitative differences among sample concentrations. If the minimum magnitude for a particular analytical method is sufficiently below an action level or risk screening criterion, then the method sensitivity is deemed sufficient to fully evaluate the data set with respect to the desired reference values. Frequently, screening levels fall below the sensitivity of even the most sensitive analytical methods. In such cases, it is necessary to review the qualifications of several laboratories, both from the standpoint of sensitivity as well as other data quality indicators, to select the best laboratory for the project.

The method detection limit (MDL) is defined as the statistically calculated minimum amount that can be measured with 99 percent confidence that the reported value is greater than zero in a given analytical procedure. MDLs are specified in the individual methods and are developed by the laboratory for each analyte of interest representing the aqueous and solid matrices within the capability of an analytical method.

The practical quantitation limit (PQL) is the lowest value that can be reliably quantified with acceptable levels of precision and accuracy under routine operating conditions. The PQL is always greater than the statistically calculated MDL.

The method reporting limit (MRL) represents the normally obtainable measurement level achieved and reported by the laboratory under practical and routine laboratory conditions for a variety of sample matrices. Sample-specific reporting limits may vary from the standard MRL as a result of sample matrix, volume, and compound concentration. MRLs and MDLs will be adjusted for dilutions, as necessary, by the laboratory. The MDLs, PQLs, and MRLs required for this project are such that data can be compared to the lowest possible applicable, relevant, and appropriate requirements (ARARs) suitable for the site. The reporting limits that will be used during the project are noted in Tables 5a and 5b.

6. QUALITY CONTROL

QC is the implementation, monitoring, and documentation of quality processes and procedures. Procedural aspects, from project planning, sample collection, and laboratory analysis to data assessment, imparts a significant and often critical bearing on environmental decisions.

QC samples that may be used to evaluate analytical data in terms of the quality criteria parameters include duplicate samples, equipment-rinsate blanks, temperature blanks, method blanks, and MS/MSD. These include QC samples prepared in the field and by the analytical laboratory. Method-specific QC procedures are detailed in the analytical laboratory's standard operating procedures and will be available upon request. The minimum requirements of the analytical laboratory's QA/QC plan include the frequency of QC sample analysis, acceptance criteria (control limits) and corrective actions, and a description of the holding time criteria to be used to assess data quality.

6.1 Field Quality Control Requirements

For field sampling, QC samples are used to assess sample collection techniques and environmental conditions during sample collection and transport. For this project, field QC samples include duplicate samples and temperature blanks. Equipment rinsate blanks may be collected if appropriate reusable field equipment is used. QC samples and frequency of collection are discussed in the following sections. A summary of specifications for containers, holding times, preservation, and handling for each matrix and analysis group is shown in Table A-2.

Results from analyses of the QC sample types described below are used as independent, external checks on field contamination, as well as the precision of sampling.

6.1.1 Field Measurements

QC procedures for pH, conductivity, dissolved oxygen, oxidation-reduction potential, turbidity, and temperature measurements are limited to calibrating the instruments according to the manufacturers' specifications.

6.1.2 Duplicate Samples

Duplicate samples may be used to assess variability in sampling techniques. Duplicate samples will be collected in accordance with SOP-9: Collecting Field Duplicates. A duplicate sample pair is typically a single grab sample that is split into two samples during collection. For each duplicate sample pair, one sample is labeled with the sample identification and the other is labeled with a blind duplicate sample identification. This sample pair is then submitted to the same analytical laboratory as two separate samples. Precision will be evaluated by calculating the RPD between the field duplicate samples. The RPD will be calculated for field duplicate pairs for each analyte whose measured values are greater than twice the MRL.

The frequency for duplicate samples shall typically be one per 20 investigative samples, with a minimum of one duplicate within each media per sampling event.

6.1.3 Equipment-Rinsate and Field Blanks

Equipment-rinsate blanks consist of analyte- and reagent-free water (preferably provided by the analytical laboratory) that is poured over reusable sampling equipment after standard decontamination has been performed. Laboratory-provided PFAS-free water will be used for analytical testing of PFAS constituents. The runoff (rinsate) is collected in clean sample containers appropriate for the analyses being performed. Typically, equipment-rinsate blanks are analyzed for the same parameters as the associated environmental samples that were collected using the sampling equipment. Procedures for collecting equipment-rinsate blanks are shown in SOP-11: Equipment Decontamination and Rinsate Blanks (Appendix A-2).

Equipment-rinsate blanks are commonly used to evaluate the effectiveness of decontamination of sampling equipment, and data validation protocols include steps for evaluating equipment-rinsate blank results and applying appropriate data qualifiers when blank results indicate the potential for cross-contamination of field samples. Potential sources of bias or cross-contamination include sampling gloves and sampling equipment that may incidentally come into contact with the sample.

Equipment-rinsate blanks are analyzed as regular field samples for the same suite of analytical parameters as the associated samples. Equipment-rinsate blanks will not be designated for analytical laboratory use in preparation of matrix spike or analytical duplicate samples. Equipment-rinsate blanks may be collected at a minimum frequency of one per every 20 field samples when non-dedicated sampling equipment is used and will only be collected for aqueous samples.

If reusable sampling equipment is not used, a field blank may be collected in lieu of an equipment-rinsate blank. A field blank is collected by pouring analyte- and reagent-free water directly into sample containers at a location that is within the boundaries of the work area at the site. Field blanks will also be prepared on dates when PFAS samples are collected by filling a sample container with PFAS-free water in the field in the same manner as environmental samples. Typically, one field blank is collected for each day of sampling.

6.1.4 Temperature Blanks

A temperature blank is used to monitor temperature preservation of samples transported to the contract analytical laboratory. For most of the analytical testing methods, the temperature blank is distilled water stored in a glass/plastic vial or jar and is typically provided by the analytical laboratory. For PFAS sampling, the temperature blank will be filled with PFAS-free water prior to shipment of the sample containers. A temperature blank will be included with each sample cooler submitted for chemical analysis. Upon receipt by the analytical laboratory, the sample custodian will measure and record the temperature of the blank sample.

Temperature blanks are commonly used to evaluate the effectiveness of preservation requirements (e.g., chilling samples on ice during shipment to the analytical laboratory) and application of appropriate data qualifiers when blank results indicate the potential for elevated temperatures to affect field samples during transport to the analytical laboratory. Typically, the temperature blank must be within the criteria of 4±2°C (2°C to 6°C).

6.1.5 Trip Blanks

Trip blanks are used to assess if contamination is introduced during sample shipment. Each trip blank is a clean sample of the matrix that accompanies samples (and sample containers). Trip blanks will be prepared by the laboratory, transported to the field site, and transported back to the laboratory without having been exposed to sampling procedures. Typically, one trip blank is collected for each cooler of samples.

6.2 Laboratory Quality Control Requirements

6.2.1 Laboratory Operational Requirements

The laboratories that will analyze samples for this project maintain and follow a documented QA program that conforms to The National Environmental Laboratory Accreditation Conference (NELAC) Institute guidance. Sampling for this project includes analysis of groundwater and/or soil for dioxins/furans, metals, PFAS, TPH, VOCs[7], SVOCs[8], BTEX, PCBs, DMSO, TOC, and general chemistry parameters. Analytical methods are provided in Tables A-2a and A-2b. Consistent use of these methods throughout the project will allow comparability among the samples collected and will achieve the DQOs for the project. Laboratory analysis will occur at a laboratory that meets the accreditation standards in WAC 173-50 and in accordance with the laboratory's SOPs. The laboratory will be responsible for necessary equipment calibration procedures and laboratory instrument and equipment maintenance, testing, and inspection.

Prior to field work, a request for supplies and sample containers from vendors and laboratories will be submitted by the QA Officer and Laboratory Coordinator (Table A-1). These supplies will be free of contaminants and interferences. The laboratories will provide containers that have been certified clean. Certificates will be maintained in the project files.

6.2.2 Method Blanks

A method (or preparation) blank is prepared at the frequency specified by the referenced method (typically one per analytical batch). The purpose of the method blank is to ensure that contaminants are not introduced by the glassware, reagents, standards, personnel, or the sample preparation environment.

Various routine QC checks are in place to verify that new lots of sample containers, reagents and standards, decontaminated glassware, sample storage areas (including refrigerators), and water purification systems are contaminant free.

6.2.3 Matrix Spike /Matrix Spike Duplicates

MS/MSD duplicate pairs provide information to assess precision and accuracy, and are used to assess interferences caused by the sample matrix. The MS is a second, extra aliquot of an environmental sample to which known concentrations of target analytes have been added. The MS is carried out through the entire analytical procedure, and the recovery of the analytes is calculated. Results are expressed as percent R. The MS is used to evaluate the effect of the sample matrix on

[7] VOCs includes PCE, TCE, 1,1,1-trichloroethane, 1,1-dichloroethene, 1,2-dibromoethane, cis-1,2-DCE, and MTBE.
[8] SVOCs includes naphthalene, diphenyl, and PAHs.

the accuracy of the analysis. The MSD is a third, extra aliquot of an environmental sample that is also spiked with the same known concentrations of analytes used for the MS. The two spiked aliquots are processed separately, and the results are compared to determine the effects of the matrix on the precision and accuracy of the analysis. Results are expressed as RPD and percent R.

If needed, MS/MSD samples will be collected in the same manner and at the same time and location as a primary sample. The MS/MSD will be site-specific, and field personnel will therefore be responsible for collecting additional sample volumes (three times the normal volume) to account for the MS/MSD samples. One MS/MSD set will be analyzed for every 20 investigative samples as applicable to the method. MS/MSD samples will be labeled with the same sample name and time as the primary sample and denoted as MS/MSD samples on the chain-of-custody and sample label.

6.2.4 Laboratory Control Samples

LCSs are fortified with spike standard solutions containing target parameters of interest. The recovery of these standards is quantitatively measured during analysis, and historical records maintained on the percent R for each sample. LCSs will be analyzed for every batch of 20 samples or fewer.

6.2.5 Surrogate Spikes

Surrogate spike analyses provide information on a laboratory's ability to recover the analytes of interest. The surrogate spike is carried through the entire analytical procedure, and the recoveries of the surrogate spikes are calculated. Results are expressed as percent R for each sample. Surrogates are added to samples based on the specifications of the individual analytical method.

7. DOCUMENTATION AND DATA MANAGEMENT

Documentation and data management are critical steps in maintaining quality in the RI process. Documentation and data management begin with the development of appropriate field forms prior to field mobilization, continue with appropriate recordkeeping in the field, and conclude with thorough records management and database population after the work has been completed. The following sections describe these steps in greater detail.

7.1 Field Documentation

Field visits and sample collection programs are documented using a combination of field logbooks and specific field forms. These two methods have their advantages and disadvantages, as follows:

- Field logbooks have the advantage of maintaining work chronology. Since pages and lines are used in sequence without skips or spaces, it is possible to reconstruct the sequence of work if quality issues or other incidents arise. Field logbooks provide flexibility, in that they can be used to document nearly any site work. The disadvantage is that for record-intensive work, such as groundwater sampling, they lack entry boxes for field parameters, which discourages consistent data collection.
- Conversely, specific field forms have the advantage of customization (e.g., a groundwater sampling form can be designed in detail to remind the field team member to record a list of specific readings). Field forms are valuable for large sampling events in which consistency in the method of recording observations is desired.

If the work is short in duration (e.g., less than 1 day) and irregular or ad hoc in nature (i.e., involves tasks not captured by a standard field form), then the work shall be documented in the field logbook. Conversely, if the site visit is longer in duration and more repetitive (e.g., a major groundwater or soil sampling event), corresponding field forms will be used for documentation of each sample, whereas the field logbook will be used to document a summary of the day's activities and non-repetitive tasks.

As such, the field logbooks will provide a comprehensive overview of site activities; the level of detail in the field logbook will depend upon the duration of an individual visit and the applicability of field forms to the tasks performed. Field logbooks and forms will be completed in accordance with SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures.

7.2 Laboratory Data Reporting

The analytical laboratory is responsible for providing sufficient laboratory documentation such that the sample results are traceable to the field samples, and the analytical data can be verified and validated by an independent third-party reviewer, if applicable. Analytical laboratory data packages will contain

- cover letter,
- chain-of-custody forms,
- a summary of sample results, and

- a summary of QC results.

The minimum information to be presented for each sample for each parameter or parameters group will include

- client sample number and analytical laboratory sample number,
- sample matrix,
- date of extraction/preparation and date/time of analysis,
- dilution factors,
- sample weights/volumes used in sample preparation/analysis,
- identification of analytical instrument,
- analytical method,
- detection/quantitation and reporting limits, and
- definitions of any data qualifiers used.

The minimum QC summary information to be presented for each sample for each parameter or parameter group will include

- surrogate standard recovery results,
- matrix QC results (MS/MSD, duplicate),
- method blank results, and
- laboratory duplicate results and control limits.

The laboratory will securely store data for this project, and it will be the responsibility of the lead laboratory to store data generated by subcontracted laboratories, if used. Electronic data deliverables (EDDs) from the laboratory will be provided to GP and its environmental consultant in an EQuIS EQEDD format. Analytical data collected as part of this program will be incorporated into a database system maintained by the environmental consultant.

7.3 Data Management

Collecting and recording field observations and measurements, analyzing data, and other data management activities will be performed and documented such that project team members can easily use the information. Field and analytical data typically will be summarized in a tabular or other appropriate format (i.e., Excel spreadsheet or charts). Information and data will be reported as required by Ecology in the AO. For analytical data, units designated by the analytical method will be reported. Analytical data will be verified with the original sources of laboratory data whenever transcription is required.

Deviation(s) from this SAP/QAPP will be communicated to Ecology when results are reported. As required by the AO, new site data and information will be provided to Ecology in the quarterly Progress Reports as it is available, and laboratory analysis will be provided in electronic format

when it has been validated. It is understood that Ecology will be responsible for entering sampling data in the Environmental Information Management System (EIM) in accordance with WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840: Data Submittal Requirements. Electronic survey data for monitoring locations, electronic lab data, and GIS maps will be provided to Ecology in the RI Report.

8. DATA REDUCTION, REVIEW, VERIFICATION AND VALIDATION PROCESS

This section addresses the stages of data quality assessment by the laboratory and by the QA Officer and Laboratory Coordinator (Table A-1) after data have been generated and received (i.e., data reduction, review, verification, and validation). It also sets procedures for evaluating the usability of data with respect to the DQOs set forth in this SAP/QAPP.

8.1 Data Evaluation Roles and Responsibilities

The following components of data evaluation will be performed by certain entities, as noted:

- Data reduction will be performed by the analytical laboratory.
- Data review will be performed both by the laboratory and QA Officer.
- Data verification will be performed both by the laboratory and QA Officer.
- Data validation and usability determination will be performed by the QA Officer.

8.2 Data Reduction

Raw analytical data generated in the laboratory are collected from the instruments and associated data systems. Laboratory analysts review data as they are generated to determine that the instruments are performing within specifications. This review includes calibration checks, surrogate recoveries, blank checks, retention time reproducibility, and other QC checks as specified in the laboratory SOPs. If problems are noted during the analytical run, corrective action is taken by the laboratory and documented. Each analytical run is reviewed for completeness prior to interpretation and data reduction.

8.3 Data Review

Data review is an initial and relatively non-technical step of data assessment that primarily addresses issues of completeness and data handling integrity. In the data review, the QA Officer and Laboratory Coordinator (and their team) will ensure that necessary reporting components have been included in laboratory reports, such as necessary fields (e.g., collection/analysis dates, units, etc.) as well as the presence of (but not implications of) QA/QC data components (e.g., LCS records, surrogate results, etc.).

Field generated data (e.g., field forms, logbooks, electronic instrument data, etc.) are also reviewed for completeness by the project team, including by not limited to the Project Manager, Field Team Leader, QA Officer and Laboratory Coordinator (Table A-1).

8.4 Data Verification and Validation

Data verification is a more technical process than data review in that the core technical aspects of data quality (e.g., precision, accuracy, etc.) are evaluated through a review of the results of QA/QC measures, such as LCSs and surrogates.

The analytical laboratory is responsible for verifying analytical results prior to the submittal of the final laboratory data report. The laboratory QA Manager will review the data, including QC information, and mark as being verified in the laboratory sample management system. The laboratory will then complete the appropriate forms summarizing the QC information, and compile copies of raw data (e.g., instrument printouts, spectra, chromatograms, etc.) for delivery to the client. This package is reviewed by the laboratory PM for conformance with laboratory SOPs and to ensure that project QC goals have been met. Analytical problems (e.g., nonconformance of various method QC requirements, or control limits that warrant re-analysis and/or re-extraction of a sample) are discussed in the case narrative, which is also included with the data package deliverable.

Following data verification by the laboratory, the QA Officer and their team will conduct a USEPA Stage 2B data validation (or other as requested by Ecology) on the laboratory data. Data will be evaluated based on the method requirements, QAPP requirements, and current laboratory criteria at the time samples were submitted to the laboratory. If there are QC results outside of criteria range or method requirements, the affected data may be qualified based on the potential effect of the out-of-compliance item on the data quality. Qualifiers will be assigned using professional and technical judgement of qualified validation personnel and guidance for assigning data qualifiers outlined in the USEPA National Functional Guidelines (USEPA 2020a, 2020b, 2020c). Other versions of the National Functional Guidelines may be used as released in the future by USEPA. In addition to the National Functional Guidelines, other USEPA guidance, and project-specific considerations may be used to conduct validation. In general, data validation procedures will entail evaluating the following:

- Preservation and holding times (check to see whether samples were properly preserved and analyzed within the specified holding time)
- Method blank results (check to see whether analytes were present in method blank samples and that a blank was analyzed every 20 samples [or more often] for each matrix)
- Surrogate recovery results for organic analyses (check to see whether surrogate recoveries met control limits)
- Laboratory control sample results (check to see whether laboratory control samples met control limits)
- Field duplicate results
- Field blank results, where appropriate
- Laboratory duplicate results (check to see whether duplicate analyses were conducted every 20 samples for each matrix or at least for each batch of samples, where applicable, and that control limits were met)
- MS/MSD results for relevant analyses (check to see whether MS and MSDs were analyzed every 20 samples for each matrix or at least for each batch of samples, where applicable, and that control limits were met)
- Reported detection limits for analyses (check to see if the detection/reporting limits were adequate for comparison to appropriate regulatory criteria)

After data qualifiers have been applied (as applicable) to the data set, the validated laboratory data will be entered into a database. Upon entering this database, the data will be in a format that can then be used for project analysis and decisions.

Field generated data from sampling activities will be verified by the project team, including but not limited to the Project Manager, Field Team Leader, QA Officer and Laboratory Coordinator (Table A-1). Errors identified during the verification of data will be corrected prior to release of the final data.

8.5 Data Reporting

The laboratory data package receipt schedules will be based on the laboratory standard turnaround time. The laboratory will provide hard copy data packages consisting of several components, as well as an EDD for each set of samples (i.e., each work order). The data package deliverables from the laboratory will be specific to each type of data collected but will likely consist of Level 2 or Level 4 data packages.

Data collected during this site investigation will be incorporated into the RI Report, to be submitted to Ecology as described in the RI WP and the AO. The report will include the following:

- A description of the sampling activities and procedures used during sampling
- A description of the analysis performed on the samples
- Tabulated analytical results
- A summary of deviations from the procedures described in this SAP/QAPP, if applicable
- Chain-of-custody records
- Laboratory reports
- Data validation reports

Deliverables will be provided to Ecology electronically in Adobe (.pdf) format for all documents. Deliverables may be provided in Word (.docx) format as appropriate and required by the AO.

8.6 Data Usability

Laboratory data generated in accordance with this SAP/QAPP will be considered usable for site characterization and to direct future remedial actions unless the data validation process described herein results in rejection of data. Rejected data will not be used to support site characterization or any other project objective.

After environmental data have been reviewed, verified, and validated in accordance with the procedures described in this SAP/QAPP, the data must further be evaluated to assess whether project data quality objectives have been achieved. The QA Officer will review data quality issues, case-by-case, with respect to QAPP DQOs to render a final assessment of data usability. DQOs may be evaluated by (1) reviewing the sampling design and methods to verify that they were implemented as planned and are adequate to support project objectives, (2) reviewing issues

brought up during data review and validation, and (3) assessing limitations of the collected data. Any report or technical memorandum that includes data for this project will discuss potential impacts of data usability and will clearly define limitations associated with the data.

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APPENDIX A TABLES

Geosyntec consultants

Table A-1. Key Personnel Roles, Responsibilities, and Qualifications
Sampling and Analysis Plan / Quality Assurance Project Plan
Georgia-Pacific Consumer Products
Camas, Washington

Name/Role	Organization	Responsibilities	Qualifications / Years of Experience
Matt Tiller Georgia-Pacific Project Coordinator	Georgia-Pacific	Manages RI activities for Georgia-Pacific Consumer Products LLC, with assistance of other Georgia-Pacific personnel and Geosyntec Consultants.	NA
Tim Flynn Technical Expert	Geosyntec Consultants	Assists Georgia-Pacific with managing the RI program, reviews project deliverables for Quality Assurance/Quality Control (QA/QC), and participates in communications by Georgia-Pacific to Ecology.	BS Environmental Resources Mgmt MS Groundwater Hydrology 38 years
Cindy Bartlett Project Manager	Geosyntec Consultants	Manages RI activities on behalf of Georgia-Pacific. Monitors RI activities for compliance with Agreed Order, Statement of Work, and schedule.	BS Geology MS Geology 26 years
Madison McLaughlin Corporate Health and Safety Officer	Geosyntec Consultants	Oversees company-wide health and safety program for Geosyntec Consultants.	NA
Julia Dumond Project Health and Safety and Field Team Leader	Geosyntec Consultants	Serves as Site Health and Safety Officer for on-site activities. Coordinates and oversees sampling events and analytical data assessment activities, verifies adherence to sampling and analytical procedures, implements sample chain-of-custody protocols, and performs sample shipments. Prepares or coordinates project report deliverables required by Statement of Work.	BS Environmental Science 9 years
Erin Dunbar QA Officer and Laboratory Coordinator	Geosyntec Consultants	Functions as point of contact for analytical laboratories; oversees analytical, sampling, and data assessment activities; verifies adherence to sampling and analytical procedures; reviews data validation and sampling and analysis plans; verifies data validation completion and deliverables submittal to Ecology; and monitors schedule for field, analytical, and data validation activities. Prepares or coordinates project report deliverables required by Statement of Work.	BS Geology MS Hydrogeology 11 years

Notes:
NA = not applicable
Resumes available upon request.

Table A-2a. Soil Sampling Containers
Sampling and Analysis Plan / Quality Assurance Project Plan
Georgia-Pacific Consumer Products
Camas, Washington

Analyte	Method	Soil Samples		
		Containers	Preservatives	Holding Time
Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans	EPA SW8290	1 x 4 oz amber glass jar	Unpreserved	30 days
Perfluoroalkyl Substances (PFAS)	EPA 1633A	1 x 4oz Teflon-free plastic	Unpreserved	90 days
Gasoline-range TPH	NWTPH-Gx (gasoline)	1 x 40 mL Voa vial	Methanol	14 days
Diesel- and Heavy Oil-range Petroleum Hydrocarbons	NWTPH-Dx (diesel extended)	1 x 4 oz glass jar	Unpreserved	14 days
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	EPA SW8260	1 x 40 mL Terracore	Methanol	14 days
Volatile Organic Compounds (VOCs)	EPA SW8260	1 x 40 mL Voa vial	Methanol	14 days
Methyl tert-butyl ether (MTBE)	EPA SW8260	1 x 40 mL Terracore	Methanol	14 days
Metals	EPA SW6010 EPA SW7470 (Hg)	1 x 4 oz glass jar	Unpreserved	6 months; 28 days for Hg; 18 days for Cr
Semi-Volatile Organic Compounds (SVOCs)	EPA SW8270E SIM	1 x 4 oz amber glass jar	Unpreserved	14 days
Total Organic Carbon (TOC)	SM9060M	1 x 4 oz glass jar	Unpreserved	28 days
Pesticides (e.g., DMSO)	EPA 8081	1 x 4 oz amber glass jar	Unpreserved	14 days
Sulfide	EPA 9030M	1 x 4 oz amber glass jar	zinc acetate	7 days
Sulfate	300	1 x 4 oz glass jar	Unpreserved	28 days
Moisture	Percent Moisture	1 x 4 oz glass jar	Unpreserved	6 months
Polychlorinated Biphenyls (PCBs)	EPA SW8082	1 x 8 oz jar	Unpreserved	14 days

Note:
(a) Sampling containers, analytical methods, preservatives, and holding times may be modified as required by the selected analytical laboratory.

Abbreviations:
EPA = United States Environmental Protection Agency
mL = milliliters
HCl = hydrochloric acid
NA = Not applicable (no analyses for analyte/media)
HDPE = high density polypropylene
oz = ounce
Cr = chromium
TPH = total petroleum hydrocarbons
Hg = mercury

Table A-2b. Groundwater Sampling Containers
Sampling and Analysis Plan / Quality Assurance Project Plan
Georgia-Pacific Consumer Products
Camas, Washington

Analyte	Method	Groundwater Samples		
		Containers	Preservatives	Holding Time
Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans	EPA SW8290	2 x 1 liter amber glass bottles	Unpreserved	1 year
Perfluoroalkyl Substances (PFAS)	EPA 1633A	2 x 125 mL plastic (Teflon free)	Unpreserved	28 days
Gasoline-range TPH	NWTPH-Gx (gasoline)	3 x 40 mL glass Voa vials	HCl	14 days
Diesel- and Heavy Oil-range Petroleum Hydrocarbons	NWTPH-Dx (diesel extended)	2 x 250 mL amber glass	HCl	14 days
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	EPA SW8260	3 x 40 mL glass vials	HCl	14 days
Volatile Organic Compounds (VOCs)	EPA SW8260	3 x 40 mL glass vials	HCl	14 days
Methyl tert-butyl ether (MTBE)	EPA SW8260	3 x 40 mL glass vials	HCl	14 days
Metals	EPA SW6010 EPA SW7470 (Hg)	1 x 250 mL HDPE	HNO3	6 months; 28 days for Hg; 18 days for Cr
Semi-Volatile Organic Compounds (SVOCs)	EPA SW8270E SIM	2 x 250 mL amber glass	Unpreserved	7 days
Total Organic Carbon (TOC)	EPA SW5310	40 mL amber glass	H2SO4	28 days
Pesticides (e.g., DMSO)	EPA 8081	2 x 250 mL amber glass	Unpreserved	7 days
Sulfide	SM4500-S2-D	250 mL glass	zinc acetate/NaOH preserved	7 days
Sulfate	300	250 mL plastic unpreserved	Unpreserved	28 days
Moisture	--	--	--	--
Polychlorinated Biphenyls (PCBs)	EPA SW8082	2 x 250 mL amber glass	Unpreserved	7 days

Note:
(a) Sampling containers, analytical methods, preservatives, and holding times may be modified as required by the selected analytical laboratory.

Abbreviations:
EPA = United States Environmental Protection Agency
mL = milliliters
HCl = hydrochloric acid
NA = Not applicable (no analyses for analyte/media)
HDPE = high density polypropylene
oz = ounce
Cr = chromium
TPH = total petroleum hydrocarbons
Hg = mercury

Table A-3. Field Instruments – Preventative Maintenance Table
Sampling and Analysis Plan / Quality Assurance Project Plan
Georgia-Pacific Consumer Products
Camas, Washington

Instrument	Activity	Frequency
Multi-Parameter Water Quality Meter	Calibration and Calibration Check – pre-sampling event	Once Prior to Sampling Event
	Battery check Calibration – beginning of day Calibration check – beginning of the day Possible mid-day calibration check Calibration check – end of day	Daily
Turbidity Meter	Calibration and Calibration Check – pre-sampling event	Once Prior to Sampling Event
	Battery check Calibration – beginning of day Calibration check – beginning of the day Possible mid-day calibration check Calibration check – end of day	Daily
Photoionization Detector (PID)	Calibration and Calibration Check – pre-sampling event	Once Prior to Sampling Event
	Battery check Calibration – beginning of day Calibration check – beginning of the day Possible mid-day calibration check Calibration check – end of day	Daily
Electronic Water Level Indicator	Battery check	Daily

Table A-4. Sample Identification
Sampling and Analysis Plan / Quality Assurance Project Plan
Georgia-Pacific Consumer Products
Camas, Washington

Sample Type	Format	Example
Soil sample	BB-ID-LD-UDft-yyyymmdd-SO	SS-024-9.5-10.0ft-20220810-SO
Groundwater grab sample	BB-ID-LD-UDft-yyyymmdd-GW	MW-B3.1-20220810-GW
Groundwater PDB sample	BB-ID-yyyymmdd-GW	MW-B3.1-25-27-20220810-GW
Field duplicate	DUP-##-yyyymmdd-{ME}	DUP-02-20220810-GW
MS duplicate	MS-##-yyyymmdd-{ME}	MS-02-20220810-GW
MSD duplicate	MSD-##-yyyymmdd-{ME}	MS-02-20220810-GW
Equipment-rinsate blank	EB-##-yyyymmdd	EB-02-20220810
Field blank	FB-##-yyyymmdd	FB-02-20220810
Trip blank	TB-##-yyyymmdd	TB-02-20220810

Abbreviations:
BB = type of boring location (e.g., "SB" for soil boring, "MW" for monitoring well)
ID = location identification (e.g., "BB-ID" for a monitoring well MW-B3.1 would be "MW-B3.1", "BB-ID" for a soil boring at location 4 would be "SB-04")
MW = Monitoring Well
DUP = duplicate
EB = equipment blank
GW = sample media is groundwater
SB = soil boring
FB = field blank
TB = trip blank
SO = sample media is soil
ME = media type (e.g., soil or groundwater)
LD = lower depth of sample with one decimal point
UD = upper depth of sample with one decimal point
yyyymmdd = four-digit year, two-digit month, two-digit date (e.g., 20220810 for 10 August 2022)
= sample number
MS/MSD = matrix spike / matrix spike duplicate

Table 5A: Speciated Analytes, Method Reporting Limits, and Applicable Screening Level Values - Soil

Revision 1
August 2025

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Protective of Groundwater Vadose @ 13 degrees C	Protective of Groundwater Saturated
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8270E_SIM_I	1,4-Dioxane	123-91-1	Soil	0.00	0.025	mg/Kg	--	10	2400	1300	110000	0.0018	0.00013
NWTPH_Gx_	Gasoline	STL00228	Soil	1	4	mg/Kg	100	--	--	--	--	--	--
NWTPH_Dx	#2 Diesel (C10-C24)	STL00163	Soil	12	50	mg/Kg	2000	--	--	--	--	--	--
NWTPH_Dx	Motor Oil (>C24-C36)	STL00299	Soil	18	50	mg/Kg	2000	--	--	--	--	--	--
8270E_LL	1-Methylnaphthalene	90-12-0	Soil	0.01	0.03	mg/Kg	--	20	5600	2600	250000	0.047	0.0024
8270E_LL	2,3,4,6-Tetrachlorophenol	58-90-2	Soil	0.01	0.05	mg/Kg	--	--	2400	--	110000	4.6	0.27
8270E_LL	2,4,5-Trichlorophenol	95-95-4	Soil	0.00	0.025	mg/Kg	--	--	8000	--	350000	58	3
8270E_LL	2,4,6-Trichlorophenol	88-06-2	Soil	0.00	0.02	mg/Kg	--	91	80	12000	3500	0.092	0.0053
8270E_LL	2,4-Dichlorophenol	120-83-2	Soil	0.00	0.025	mg/Kg	--	--	240	--	11000	0.33	0.021
8270E_LL	2,4-Dimethylphenol	105-67-9	Soil	0.01	0.05	mg/Kg	--	--	1600	--	70000	4.4	0.25
8270E_LL	2,4-Dinitrophenol	51-28-5	Soil	0.06	0.25	mg/Kg	--	--	160	--	7000	0.13	0.0092
8270E_LL	2,4-Dinitrotoluene	121-14-2	Soil	0.00	0.012	mg/Kg	--	3.2	160	420	7000	0.0044	0.00024
8270E_LL	2,6-Dinitrotoluene	606-20-2	Soil	0.001	0.012	mg/Kg	--	0.67	24	88	1100	0.00092	0.000051
8270E_LL	2-Chloronaphthalene	91-58-7	Soil	0.00	0.02	mg/Kg	--	--	6400	--	280000	34	1.8
8270E_LL	2-Chlorophenol	95-57-8	Soil	0.001	0.0199	mg/Kg	--	--	400	--	18000	0.47	0.027
8270E_LL	2-Methylnaphthalene	91-57-6	Soil	0.01	0.05	mg/Kg	--	--	320	--	14000	1.7	0.088
8270E_LL	2-Methylphenol	95-48-7	Soil	0.01	0.0199	mg/Kg	--	--	4000	--	180000	8.1	0.47
8270E_LL	2-Nitroaniline	88-74-4	Soil	0.00	0.012	mg/Kg	--	--	800	--	35000	1	0.064
8270E_LL	2-Nitrophenol	88-75-5	Soil	0.00	0.02	mg/Kg	--	--	--	--	--	--	--
8270E_LL	3 & 4 Methylphenol	15831-10-4	Soil	0.01	0.04	mg/Kg	--	--	--	--	--	--	--
8270E_LL	3,3'-Dichlorobenzidine	91-94-1	Soil	0.01	0.025	mg/Kg	--	2.2	--	290	--	0.013	0.00068
8270E_LL	3-Nitroaniline	99-09-2	Soil	0.01	0.03	mg/Kg	--	--	--	--	--	--	--
8270E_LL	4,6-Dinitro-2-methylphenol	534-52-1	Soil	0.01	0.075	mg/Kg	--	--	6.4	--	280	0.024	0.0013
8270E_LL	4-Bromophenyl phenyl ether	101-55-3	Soil	0.00	0.01	mg/Kg	--	--	--	--	--	--	--
8270E_LL	4-Chloro-3-methylphenol	59-50-7	Soil	0.00	0.01	mg/Kg	--	--	8000	--	350000	22	1.2
8270E_LL	4-Chloroaniline	106-47-8	Soil	0.01	0.0996	mg/Kg	--	5	320	660	14000	0.0027	0.00017
8270E_LL	4-Chlorophenyl phenyl ether	7005-72-3	Soil	0.00	0.01	mg/Kg	--	--	--	--	--	--	--
8270E_LL	4-Nitroaniline	100-01-6	Soil	0.00	0.035	mg/Kg	--	50	320	6600	14000	0.027	0.0017
8270E_LL	4-Nitrophenol	100-02-7	Soil	0.02	0.07	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Acenaphthene	83-32-9	Soil	0.00	0.01	mg/Kg	--	--	4800	--	210000	49	2.5
8270E_LL	Acenaphthylene	208-96-8	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Acetophenone	98-86-2	Soil	0.01	0.17	mg/Kg	--	--	8000	--	350000	4	0.27
8270E_LL	Anthracene	120-12-7	Soil	0.01	0.02	mg/Kg	--	--	24000	--	1100000	1100	57
8270E_LL	Benzo[a]anthracene	56-55-3	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Benzo[a]pyrene	50-32-8	Soil	0.001	0.005	mg/Kg	0.1	0.19	24	130	1100	3.9	0.19
8270E_LL	Benzo[b]fluoranthene	205-99-2	Soil	0.00	0.01	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Benzo[g,h,i]perylene	191-24-2	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Benzo[k]fluoranthene	207-08-9	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Bis(2-chloroethoxy)methane	111-91-1	Soil	0.001	0.0025	mg/Kg	--	--	240	--	11000	0.21	0.014
8270E_LL	Bis(2-chloroethyl)ether	111-44-4	Soil	0.000	0.0025	mg/Kg	--	0.91	--	120	--	0.00022	0.000014
8270E_LL	Bis(2-ethylhexyl) phthalate	117-81-7	Soil	0.01	0.05	mg/Kg	--	71	1600	9400	70000	13	0.67
8270E_LL	bis(chloroisopropyl) ether	108-60-1	Soil	0.01	0.03	mg/Kg	--	14	3200	1900	140000	0.0035	0.00023
8270E_LL	Butyl benzyl phthalate	85-68-7	Soil	0.01	0.0199	mg/Kg	--	530	16000	69000	700000	13	0.65
8270E_LL	Carbazole	86-74-8	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Chrysene	218-01-9	Soil	0.00	0.01	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Dibenz(a,h)anthracene	53-70-3	Soil	0.000	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Dibenzofuran	132-64-9	Soil	0.01	0.02	mg/Kg	--	--	80	--	3500	1.5	0.076
8270E_LL	Diethyl phthalate	84-66-2	Soil	0.00	0.025	mg/Kg	--	--	64000	--	2800000	72	4.7

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Protective of Groundwater Vadose @ 13 degrees C	Protective of Groundwater Saturated
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8270E_LL	Dimethyl phthalate	131-11-3	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Di-n-butyl phthalate	84-74-2	Soil	0.01	0.03	mg/Kg	--	--	8000	--	350000	57	3
8270E_LL	Di-n-octyl phthalate	117-84-0	Soil	0.00	0.02	mg/Kg	--	--	800	--	35000	450	23
8270E_LL	Fluoranthene	206-44-0	Soil	0.00	0.01	mg/Kg	--	--	3200	--	140000	630	32
8270E_LL	Fluorene	86-73-7	Soil	0.00	0.01	mg/Kg	--	--	3200	--	140000	51	2.6
8270E_LL	Hexachlorobenzene	118-74-1	Soil	0.00	0.01	mg/Kg	--	0.63	64	82	2800	0.44	0.022
8270E_LL	Hexachlorobutadiene	87-68-3	Soil	0.00	0.0025	mg/Kg	--	13	80	1700	3500	0.012	0.00063
8270E_LL	Hexachlorocyclopentadiene	77-47-4	Soil	0.000562	0.005	mg/Kg	--	--	480	--	21000	1.5	0.081
8270E_LL	Hexachloroethane	67-72-1	Soil	0.00122	0.0025	mg/Kg	--	25	56	3300	2500	0.0088	0.00053
8270E_LL	Indeno[1,2,3-cd]pyrene	193-39-5	Soil	0.000851	0.005	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Isophorone	78-59-1	Soil	0.0298	0.15	mg/Kg	--	1100	16000	140000	700000	0.49	0.032
8270E_LL	Naphthalene	91-20-3	Soil	0.0105	0.03	mg/Kg	5	--	1600	--	70000	4.5	0.24
8270E_LL	Nitrobenzene	98-95-3	Soil	0.00302	0.01	mg/Kg	--	--	160	--	7000	0.1	0.0065
8270E_LL	N-Nitrosodi-n-propylamine	621-64-7	Soil	0.00725	0.03	mg/Kg	--	0.14	--	19	--	0.00012	0.0000070
8270E_LL	N-Nitrosodiphenylamine	86-30-6	Soil	0.00858	0.03	mg/Kg	--	200	--	27000	--	1	0.052
8270E_LL	Pentachlorophenol	87-86-5	Soil	0.00316	0.012	mg/Kg	--	2.5	400	330	18000	0.016	0.00088
8270E_LL	Phenanthrene	85-01-8	Soil	0.00398	0.02	mg/Kg	--	--	--	--	--	--	--
8270E_LL	Phenol	108-95-2	Soil	0.0111	0.05	mg/Kg	--	--	24000	--	1100000	37	2.3
8270E_LL	Pyrene	129-00-0	Soil	0.00153	0.01	mg/Kg	--	--	2400	--	110000	330	16
8270E_LL	Pyridine	110-86-1	Soil	0.0288	0.1	mg/Kg	--	--	80	--	3500	0.043	0.0029
8082A	PCB-1016	12674-11-2	Soil	0.00740	0.02	mg/Kg	--	14	5.6	1900	250	1.2	0.06
8082A	PCB-1221	11104-28-2	Soil	0.0120	0.02	mg/Kg	--	--	--	--	--	--	--
8082A	PCB-1232	11141-16-5	Soil	0.00490	0.02	mg/Kg	--	--	--	--	--	--	--
8082A	PCB-1242	53469-21-9	Soil	0.00800	0.02	mg/Kg	--	--	--	--	--	--	--
8082A	PCB-1248	12672-29-6	Soil	0.00700	0.02	mg/Kg	--	--	--	--	--	--	--
8082A	PCB-1254	11097-69-1	Soil	0.00900	0.02	mg/Kg	--	0.5	1.6	66	70	0.057	0.0029
8082A	PCB-1260	11096-82-5	Soil	0.00740	0.02	mg/Kg	--	0.5	--	66	--	0.36	0.018
8290A	1,2,3,4,6,7,8-HpCDD	35822-46-9	Soil	0.000000853	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,4,6,7,8-HpCDF	67562-39-4	Soil	0.00000115	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,4,7,8,9-HpCDF	55673-89-7	Soil	0.000000955	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,4,7,8-HxCDD	39227-28-6	Soil	0.00000104	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,4,7,8-HxCDF	70648-26-9	Soil	0.00000158	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,6,7,8-HxCDD	57653-85-7	Soil	0.000000768	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,6,7,8-HxCDF	57117-44-9	Soil	0.00000138	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,7,8,9-HxCDD	19408-74-3	Soil	0.00000105	0.000005	mg/Kg	--	0.00016	--	0.021	--	--	0.0000098
8290A	1,2,3,7,8,9-HxCDF	72918-21-9	Soil	0.00000132	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,7,8-PeCDD	40321-76-4	Soil	0.000000628	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	1,2,3,7,8-PeCDF	57117-41-6	Soil	0.00000139	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	2,3,4,6,7,8-HxCDF	60851-34-5	Soil	0.00000129	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	2,3,4,7,8-PeCDF	57117-31-4	Soil	0.00000111	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	2,3,7,8-TCDD	1746-01-6	Soil	0.000000161	0.000001	mg/Kg	--	0.000013	0.000093	0.0017	0.0041	0.000017	0.00000084
8290A	2,3,7,8-TCDD	85508-50-5	Soil		0.0002	mg/Kg	--	--	--	--	--	--	--
8290A	2,3,7,8-TCDF	51207-31-9	Soil	0.000000368	0.000001	mg/Kg	--	--	--	--	--	--	--
8290A	OCDD	3268-87-9	Soil	0.00000361	0.00001	mg/Kg	--	--	--	--	--	--	--
8290A	OCDF	39001-02-0	Soil	0.00000247	0.00001	mg/Kg	--	--	--	--	--	--	--
8290A	Total HpCDD	37871-00-4	Soil	0.000000853	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	Total HpCDF	38998-75-3	Soil	0.00000115	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	Total HxCDD	34465-46-8	Soil	0.00000105	0.000005	mg/Kg	--	0.00016	--	0.021	--	0.0002	0.0000098
8290A	Total HxCDF	55684-94-1	Soil	0.00000158	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	Total PeCDD	36088-22-9	Soil	0.000000628	0.000005	mg/Kg	--	--	--	--	--	--	--
8290A	Total PeCDF	30402-15-4	Soil	0.00000139	0.000005	mg/Kg	--	--	--	--	--	--	--

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Protective of Groundwater Vadose @ 13 degrees C	Protective of Groundwater Saturated
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8290A	Total TCDD	41903-57-5	Soil	0.000000161	0.000001	mg/Kg	--	0.000013	0.000093	0.0017	0.0041	--	0.00000084
8290A	Total TCDF	55722-27-5	Soil	0.000000368	0.000001	mg/Kg	--	--	--	--	--	--	--
1633A	11-Chloroeicosafluoro-3-	763051-92-9	Soil	0.0750	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorodecane	39108-34-4	Soil	0.100	0.4	µg/Kg	--	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorohexane	757124-72-4	Soil	0.100	0.4	µg/Kg	--	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorooctane	27619-97-2	Soil	0.100	0.8	µg/Kg	--	--	16	--	700	0.074	0.004
1633A	3-Perfluoroheptylpropanoic	812-70-4	Soil	0.250	1	µg/Kg	--	--	--	--	--	--	--
1633A	3-Perfluoropentylpropanoic	914637-49-3	Soil	0.250	1	µg/Kg	--	--	--	--	--	--	--
1633A	3-Perfluoropropylpropanoic	356-02-5	Soil	0.100	0.4	µg/Kg	--	--	--	--	--	--	--
1633A	4,8-Dioxa-3H-perfluorononanoic	919005-14-4	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	9-Chlorohexadecafluoro-3-	756426-58-1	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	HFPO-DA (GenX)	13252-13-6	Soil	0.0500	0.8	µg/Kg	--	--	0.24	--	11	0.00012	0.0000069
1633A	N-ethylperfluorooctane	4151-50-2	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	N-ethylperfluorooctane	1691-99-2	Soil	0.250	1	µg/Kg	--	--	--	--	--	--	--
1633A	N-ethylperfluorooctanesulfonam	2991-50-6	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	N-methylperfluorooctane	31506-32-8	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	N-methylperfluorooctane	24448-09-7	Soil	0.250	1	µg/Kg	--	--	--	--	--	--	--
1633A	N-methylperfluorooctanesulfona	2355-31-9	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Nonafluoro-3,6-dioxaheptanoic	151772-58-6	Soil	0.0620	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoro (2-ethoxyethane) sulfo	113507-82-7	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoro-3-methoxypropanoic a	377-73-1	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoro-4-methoxybutanoic ac	863090-89-5	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorobutanesulfonic acid	375-73-5	Soil	0.0500	0.2	µg/Kg	--	--	24	--	1100	0.025	0.0017
1633A	Perfluorobutanoic acid (PFBA)	375-22-4	Soil	0.100	0.8	µg/Kg	--	--	80	--	3500	0.044	0.0029
1633A	Perfluorodecanesulfonic acid	335-77-3	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorodecanoic acid	335-76-2	Soil	0.0500	0.2	µg/Kg	--	--	0.00016	--	0.007	0.00000038	0.000000022
1633A	Perfluorododecanesulfonic	79780-39-5	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorododecanoic acid	307-55-1	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoroheptanesulfonic acid	375-92-8	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoroheptanoic acid	375-85-9	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorohexanesulfonic acid	355-46-4	Soil	0.0500	0.2	µg/Kg	--	--	0.78	--	34	0.00000004	0.000004
1633A	Perfluorohexanoic acid	307-24-4	Soil	0.0500	0.2	µg/Kg	--	--	40	--	1800	0.035	0.0025
1633A	Perfluorononanesulfonic acid	68259-12-1	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorononanoic acid	375-95-1	Soil	0.0500	0.2	µg/Kg	--	--	0.2	--	8.8	0.000089	0.0000053
1633A	Perfluorooctanesulfonamide	754-91-6	Soil	0.0630	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorooctanesulfonic acid	1763-23-1	Soil	0.0500	0.2	µg/Kg	--	0.025	0.008	3.3	0.35	0.000046	0.0000026
1633A	Perfluorooctanoic acid (PFOA)	335-67-1	Soil	0.0620	0.2	µg/Kg	--	0.000034	0.0024	0.0045	0.11	0.000025	0.0000016
1633A	Perfluoropentanesulfonic acid	2706-91-4	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoropentanoic acid	2706-90-3	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorotetradecanoic acid	376-06-7	Soil	0.0580	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluorotridecanoic acid	72629-94-8	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--
1633A	Perfluoroundecanoic acid	2058-94-8	Soil	0.0500	0.2	µg/Kg	--	--	--	--	--	--	--

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Protective of Groundwater Vadose @ 13 degrees C	Protective of Groundwater Saturated
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
6020B_LL	Aluminum	7429-90-5	Soil	3.3	15	mg/Kg	--	--	80000	--	3500000	480000	24000
6020B_LL	Antimony	7440-36-0	Soil	0.034	0.075	mg/Kg	--	--	32	--	1400	5.4	0.27
6020B_LL	Arsenic	7440-38-2	Soil	0.05	0.25	mg/Kg	20	0.67	4.8	88	210	2.9	0.15
6020B_LL	Barium	7440-39-3	Soil	0.114	0.5	mg/Kg	--	--	16000	--	700000	1600	83
6020B_LL	Beryllium	7440-41-7	Soil	0.024	0.1	mg/Kg	--	--	160	--	7000	63	3.2
6020B_LL	Cadmium	7440-43-9	Soil	0.0385	0.4	mg/Kg	2	--	80	--	3500	0.69	0.035
6020B_LL	Chromium	7440-47-3	Soil	0.0315	0.5	mg/Kg	2000	1.2	120000	820	5300000	2000	100
6020B_LL	Cobalt	7440-48-4	Soil	0.005	1	mg/Kg	--	--	24	--	1100	4.3	0.22
6020B_LL	Copper	7440-50-8	Soil	0.11	0.2	mg/Kg	--	--	3200	--	140000	280	14
6020B_LL	Iron	7439-89-6	Soil	5.77	63.9	mg/Kg	--	--	56000	--	2500000	150	7.6
6020B_LL	Lead	7439-92-1	Soil	0.024	0.25	mg/Kg	250	--	--	--	--	3000	150
6020B_LL	Manganese	7439-96-5	Soil	0.227	0.55	mg/Kg	--	--	3700	--	160000	65	3.3
6020B_LL	Nickel	7440-02-0	Soil	0.0965	0.25	mg/Kg	--	--	1600	--	70000	420	21
6020B_LL	Selenium	7782-49-2	Soil	0.143	0.55	mg/Kg	--	--	400	--	18000	5.2	0.26
6020B_LL	Silver	7440-22-4	Soil	0.01	0.1	mg/Kg	--	--	400	--	18000	14	0.69
6020B_LL	Thallium	7440-28-0	Soil	0.0275	0.25	mg/Kg	--	--	0.8	--	35	0.23	0.011
6020B_LL	Vanadium	7440-62-2	Soil	0.136	1	mg/Kg	--	--	400	--	18000	1600	80
6020B_LL	Zinc	7440-66-6	Soil	0.805	2.55	mg/Kg	--	--	24000	--	1100000	6000	300
6010D	Calcium	7440-70-2	Soil	10	55	mg/Kg	--	--	--	--	--	--	--
6010D	Magnesium	7439-95-4	Soil	7.92	55	mg/Kg	--	--	--	--	--	--	--
6010D	Potassium	7440-09-7	Soil	165	18.6	mg/Kg	--	--	--	--	--	--	--
6010D	Sodium	7440-23-5	Soil	18.8	100	mg/Kg	--	--	--	--	--	--	--
6010D	Aluminum	7429-90-5	Soil	9.95	75	mg/Kg	--	--	80000	--	3500000	480000	24000
6010D	Antimony	7440-36-0	Soil	0.263	3	mg/Kg	--	--	32	--	1400	5.4	0.27
6010D	Arsenic	7440-38-2	Soil	0.248	3	mg/Kg	20	0.67	24	88	1100	2.9	0.15
6010D	Barium	7440-39-3	Soil	0.079	0.5	mg/Kg	--	--	16000	--	700000	1600	83
6010D	Beryllium	7440-41-7	Soil	0.07	1	mg/Kg	--	--	160	--	7000	63	3.2
6010D	Cadmium	7440-43-9	Soil	0.049	1	mg/Kg	2	--	80	--	3500	0.69	0.035
6010D	Chromium	7440-47-3	Soil	0.216	1.3	mg/Kg	--	1.2	120000	820	5300000	2000	100
6010D	Cobalt	7440-48-4	Soil	0.052	1	mg/Kg	--	--	24	--	1100	4.3	0.22
6010D	Copper	7440-50-8	Soil	0.4	2.5	mg/Kg	--	--	3200	--	140000	280	14
6010D	Iron	7439-89-6	Soil	15.5	65	mg/Kg	--	--	56000	--	2500000	150	7.6
6010D	Lead	7439-92-1	Soil	0.222	1.5	mg/Kg	250	--	--	--	--	3000	150
6010D	Manganese	7439-96-5	Soil	0.383	2	mg/Kg	--	--	3700	--	160000	65	3.3
6010D	Nickel	7440-02-0	Soil	0.103	1	mg/Kg	--	--	1600	--	70000	420	21
6010D	Selenium	7782-49-2	Soil	0.396	5	mg/Kg	--	--	400	--	18000	5.2	0.26
6010D	Silver	7440-22-4	Soil	0.56	2.5	mg/Kg	--	--	400	--	18000	14	0.69
6010D	Thallium	7440-28-0	Soil	0.42	5	mg/Kg	--	--	0.8	--	35	0.23	0.011
6010D	Vanadium	7440-62-2	Soil	0.261	2	mg/Kg	--	--	400	--	18000	1600	80
6010D	Zinc	7440-66-6	Soil	0.955	4	mg/Kg	--	--	24000	--	1100000	6000	300
7471A	Mercury	7439-97-6	Soil	0.009	0.03	mg/Kg	2	--	--	--	--	2.1	0.1
Moisture	Percent Moisture	STL00177	Soil	0.1	0.1	%	--	--	--	--	--	--	--
Moisture	Percent Solids	STL00234	Soil	0.1	0.1	%	--	--	--	--	--	--	--
9060A	Total Organic Carbon	TOC	Soil	96.7	2000	mg/Kg	--	--	--	--	--	--	--
300.0_28D	Sulfate	14808-79-8	Soil	7.75	20	mg/Kg	--	--	--	--	--	--	--
SM4500_S2_	Sulfide	18496-25-8	Soil	0.100	0.3	mg/L	--	--	--	--	--	--	--
8260D	1,1,1-Trichloroethane	71-55-6	Soil	0.0006	0.005	mg/Kg	2	--	160000	--	7000000	1.5	0.084
8260D	1,1,2,2-Tetrachloroethane	79-34-5	Soil	0.0004	0.005	mg/Kg	--	5	1600	660	70000	0.0012	0.00008
8260D	1,1,2-Trichloro-1,2,2-	76-13-1	Soil	0.0006	0.01	mg/Kg	--	--	2400000	--	110000000	7600	120
8260D	1,1,2-Trichloroethane	79-00-5	Soil	0.0005	0.005	mg/Kg	--	18	320	2300	14000	0.017	0.0011
8260D	1,1-Dichloroethane	75-34-3	Soil	0.0005	0.005	mg/Kg	--	180	16000	23000	700000	0.041	0.0026

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Protective of Groundwater Vadose @ 13 degrees C	Protective of Groundwater Saturated
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8260D	1,1-Dichloroethene	75-35-4	Soil	0.0005	0.005	mg/Kg	--	--	4000	--	180000	0.046	0.0025
8260D	1,1-Dichloropropene	563-58-6	Soil	0.0005	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	1,2,3-Trichlorobenzene	87-61-6	Soil	0.01	0.01	mg/Kg	--	--	64	--	2800	0.2	0.011
8260D	1,2,3-Trichloropropane	96-18-4	Soil	0.001	0.005	mg/Kg	--	0.0063	320	4.4	14000	0.0000024	0.00000015
8260D	1,2,4-Trichlorobenzene	120-82-1	Soil	0.01	0.01	mg/Kg	--	34	800	4500	35000	0.56	0.029
8260D	1,2,4-Trimethylbenzene	95-63-6	Soil	0.001	0.005	mg/Kg	--	--	800	--	35000	1.3	0.072
8260D	1,2-Dibromo-3-Chloropropane	96-12-8	Soil	0.001	0.005	mg/Kg	--	0.23	16	160	700	0.00091	0.000058
8260D	1,2-Dibromoethane	106-93-4	Soil	0.000	0.005	mg/Kg	0.005	0.50	720	66	32000	0.00027	0.000018
8260D	1,2-Dichlorobenzene	95-50-1	Soil	0.001	0.005	mg/Kg	--	--	7200	--	320000	7.0	0.4
8260D	1,2-Dichloroethane	107-06-2	Soil	0.001	0.005	mg/Kg	--	11	480	1400	21000	0.023	0.0016
8260D	1,2-Dichloropropane	78-87-5	Soil	0.001	0.005	mg/Kg	--	27	3200	3500	140000	0.025	0.0017
8260D	1,3,5-Trimethylbenzene	108-67-8	Soil	0.001	0.005	mg/Kg	--	--	800	--	35000	1.3	0.071
8260D	1,3-Dichlorobenzene	541-73-1	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	1,4-Dichlorobenzene	106-46-7	Soil	0.0004	0.005	mg/Kg	--	190	5600	24000	250000	1.2	0.068
8260D	2-Butanone (MEK)	78-93-3	Soil	0.002	0.01	mg/Kg	--	--	48000	--	2100000	20	1.4
8260D	2-Hexanone	591-78-6	Soil	0.001	0.01	mg/Kg	--	--	400	--	18000	0.17	0.012
8260D	4-Methyl-2-pentanone (MIBK)	108-10-1	Soil	0.001	0.01	mg/Kg	--	--	6400	--	280000	2.7	0.19
8260D	Acetone	67-64-1	Soil	0.01	0.02	mg/Kg	--	--	72000	--	3200000	29	2.1
8260D	Benzene	71-43-2	Soil	0.001	0.005	mg/Kg	0.03	18	320	2400	14000	0.027	0.0017
8260D	Bromochloromethane	74-97-5	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Bromodichloromethane	75-27-4	Soil	0.000	0.005	mg/Kg	--	16	1600	2100	70000	0.033	0.0022
8260D	Bromoform	75-25-2	Soil	0.01	0.01	mg/Kg	--	130	1600	17000	70000	0.36	0.023
8260D	Bromomethane	74-83-9	Soil	0.001	0.005	mg/Kg	--	--	110	--	4900	0.051	0.0033
8260D	Carbon disulfide	75-15-0	Soil	0.001	0.005	mg/Kg	--	--	8000	--	350000	4.1	0.25
8260D	Carbon tetrachloride	56-23-5	Soil	0.001	0.005	mg/Kg	--	14	320	1900	14000	0.041	0.0022
8260D	Chlorobenzene	108-90-7	Soil	0.001	0.005	mg/Kg	--	--	1600	--	70000	0.86	0.051
8260D	Chloroethane	75-00-3	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Chloroform	67-66-3	Soil	0.001	0.005	mg/Kg	--	32	800	4200	35000	0.074	0.0048
8260D	Chloromethane	74-87-3	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	cis-1,2-Dichloroethene	156-59-2	Soil	0.001	0.005	mg/Kg	--	--	160	--	7000	0.079	0.0052
8260D	cis-1,3-Dichloropropene	10061-01-5	Soil	0.000	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Cyclohexane	110-82-7	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Dibromochloromethane	124-48-1	Soil	0.001	0.005	mg/Kg	--	12	1600	1600	70000	0.024	0.0017
8260D	Dichlorodifluoromethane	75-71-8	Soil	0.001	0.005	mg/Kg	--	--	16000	--	700000	38	0.53
8260D	Ethylbenzene	100-41-4	Soil	0.0004	0.005	mg/Kg	6	--	8000	--	350000	5.9	0.34
8260D	Isopropylbenzene	98-82-8	Soil	0.0004	0.005	mg/Kg	--	--	8000	--	350000	15	0.79
8260D	Methyl acetate	79-20-9	Soil	0.001	0.005	mg/Kg	--	--	80000	--	3500000	33	2.3
8260D	Methyl tert-butyl ether	1634-04-4	Soil	0.001	0.005	mg/Kg	0.1	560	--	73000	--	0.1	0.0072
8260D	Methylcyclohexane	108-87-2	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Methylene Chloride	75-09-2	Soil	0.002	0.005	mg/Kg	0.02	94	480	66000	21000	0.022	0.0015
8260D	m-Xylene & p-Xylene	179601-23-1	Soil	0.001	0.005	mg/Kg	--	--	16000	--	700000	--	0.77
8260D	o-Xylene	95-47-6	Soil	0.0004	0.005	mg/Kg	--	--	16000	--	700000	14	0.84
8260D	Styrene	100-42-5	Soil	0.0004	0.005	mg/Kg	--	--	16000	--	700000	2.2	0.12
8260D	Tetrachloroethene	127-18-4	Soil	0.001	0.005	mg/Kg	0.05	480	480	63000	21000	0.05	0.0028
8260D	Toluene	108-88-3	Soil	0.001	0.005	mg/Kg	7	--	6400	--	280000	4.5	0.27
8260D	trans-1,2-Dichloroethene	156-60-5	Soil	0.001	0.005	mg/Kg	--	--	1600	--	70000	0.52	0.032
8260D	trans-1,3-Dichloropropene	10061-02-6	Soil	0.001	0.005	mg/Kg	--	--	--	--	--	--	--
8260D	Trichloroethene	79-01-6	Soil	0.001	0.005	mg/Kg	0.03	12	40	2900	1800	0.025	0.0015
8260D	Trichlorofluoromethane	75-69-4	Soil	0.001	0.005	mg/Kg	--	--	24000	--	1100000	23	0.79
8260D	Vinyl chloride	75-01-4	Soil	0.001	0.005	mg/Kg	--	0.67	240	88	11000	0.0017	0.00009

Notes

-- = not established
NA = not available
µg/L = micrograms per liter

MDL = method detection limit
MRL - method reporting limit

(a) Ecology's Cleanup Levels and Risk Calculations (CLARC) last updated in February 2025. Accessed in April 2025.
(b) MDLs and MRLs provided by Eurofins in March 2023, except for Method 1633 (provided by Eurofins in February 2025). If a different laboratory is used, reporting limits will be requested from that laboratory.
(c) Method 1613B, Dioxins and Furans: MDL column values are EDLs (estimated detection limits).

Table 5B: Speciated Analytes, Method Reporting Limits, and Applicable Screening Level Values - Groundwater

Revision 1
August 2025

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	MTCA Cleanup Level (a)					
							Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Target for Soil to Groundwater Pathway
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
8260D_LL	1,1,1-Trichloroethane	71-55-6	Groundwater	0.025	0.2	µg/L	200	--	16000	--	35000	200
8260D_LL	1,1,2,2-Tetrachloroethane	79-34-5	Groundwater	0.056	0.2	µg/L	--	0.22	160	2.2	350	0.22
8260D_LL	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	Groundwater	0.088	0.5	µg/L	--	--	240000	--	530000	240000
8260D_LL	1,1,2-Trichloroethane	79-00-5	Groundwater	0.07	0.2	µg/L	--	0.77	32	7.7	70	3
8260D_LL	1,1-Dichloroethane	75-34-3	Groundwater	0.025	0.2	µg/L	--	7.7	1600	77	3500	7.68
8260D_LL	1,1-Dichloroethene	75-35-4	Groundwater	0.035	0.2	µg/L	--	--	400	--	880	7
8260D_LL	1,1-Dichloropropene	563-58-6	Groundwater	0.084	0.2	µg/L	--	--	--	--	--	--
8260D_LL	1,2,3-Trichlorobenzene	87-61-6	Groundwater	0.149	0.5	µg/L	--	--	6.4	--	14	6.4
8260D_LL	1,2,3-Trichloropropane	96-18-4	Groundwater	0.05	0.2	µg/L	--	0.00038	32	0.015	70	0.00038
8260D_LL	1,2,4-Trichlorobenzene	120-82-1	Groundwater	0.172	0.5	µg/L	--	1.5	80	15	180	15
8260D_LL	1,2,4-Trimethylbenzene	95-63-6	Groundwater	0.203	0.5	µg/L	--	--	80	--	180	80
8260D_LL	1,2-Dibromo-3-Chloropropane	96-12-8	Groundwater	0.167	2	µg/L	--	0.014	1.6	0.55	3.5	0.14
8260D_LL	1,2-Dibromoethane	106-93-4	Groundwater	0.025	0.1	µg/L	0.01	0.022	72	0.22	160	0.05
8260D_LL	1,2-Dichlorobenzene	95-50-1	Groundwater	0.038	0.3	µg/L	--	--	720	--	1600	600
8260D_LL	1,2-Dichloroethane	107-06-2	Groundwater	0.043	0.2	µg/L	5	0.48	48	4.8	110	4.81
8260D_LL	1,2-Dichloropropane	78-87-5	Groundwater	0.06	0.2	µg/L	--	1.2	320	12	700	5
8260D_LL	1,3,5-Trimethylbenzene	108-67-8	Groundwater	0.152	0.5	µg/L	--	--	80	--	180	80
8260D_LL	1,3-Dichlorobenzene	541-73-1	Groundwater	0.05	0.3	µg/L	--	--	--	--	--	--
8260D_LL	1,4-Dichlorobenzene	106-46-7	Groundwater	0.05	0.3	µg/L	--	8.1	560	81	1200	75
8260D_LL	2-Butanone (MEK)	78-93-3	Groundwater	2.5	10	µg/L	--	--	4800	--	11000	4800
8260D_LL	2-Hexanone	591-78-6	Groundwater	0.944	3	µg/L	--	--	40	--	88	40
8260D_LL	4-Methyl-2-pentanone (MIBK)	108-10-1	Groundwater	1.7	10	µg/L	--	--	640	--	1400	640
8260D_LL	Acetone	67-64-1	Groundwater	3.1	10	µg/L	--	--	7200	--	16000	7200
8260D_LL	Benzene	71-43-2	Groundwater	0.03	0.2	µg/L	5	0.8	32	8	70	5
8260D_LL	Bromochloromethane	74-97-5	Groundwater	0.05	0.2	µg/L	--	--	--	--	--	--
8260D_LL	Bromodichloromethane	75-27-4	Groundwater	0.06	0.2	µg/L	--	0.71	160	7.1	350	7.1
8260D_LL	Bromoform	75-25-2	Groundwater	0.157	0.5	µg/L	--	5.5	160	55	350	55.38
8260D_LL	Bromomethane	74-83-9	Groundwater	0.126	0.5	µg/L	--	--	11	--	25	11.2
8260D_LL	Carbon disulfide	75-15-0	Groundwater	0.083	0.3	µg/L	--	--	800	--	1800	800
8260D_LL	Carbon tetrachloride	56-23-5	Groundwater	0.025	0.2	µg/L	--	0.63	32	6.3	70	5
8260D_LL	Chlorobenzene	108-90-7	Groundwater	0.06	0.2	µg/L	--	--	160	--	350	100
8260D_LL	Chloroethane	75-00-3	Groundwater	0.096	0.5	µg/L	--	--	--	--	--	--
8260D_LL	Chloroform	67-66-3	Groundwater	0.03	0.2	µg/L	--	1.4	80	14	180	14.11
8260D_LL	Chloromethane	74-87-3	Groundwater	0.14	0.5	µg/L	--	--	--	--	--	--
8260D_LL	cis-1,2-Dichloroethene	156-59-2	Groundwater	0.055	0.2	µg/L	--	--	16	--	35	16
8260D_LL	cis-1,3-Dichloropropene	10061-01-5	Groundwater	0.09	0.2	µg/L	--	--	--	--	--	--
8260D_LL	Cyclohexane	110-82-7	Groundwater	--	0.2	µg/L	--	--	--	--	--	--
8260D_LL	Dibromochloromethane	124-48-1	Groundwater	0.055	0.2	µg/L	--	0.52	160	5.2	350	5.2
8260D_LL	Dichlorodifluoromethane	75-71-8	Groundwater	0.128	0.4	µg/L	--	--	1600	--	3500	1600
8260D_LL	Ethylbenzene	100-41-4	Groundwater	0.03	0.2	µg/L	700	--	800	--	1800	700
8260D_LL	Isopropylbenzene	98-82-8	Groundwater	0.187	1	µg/L	--	--	800	--	1800	800
8260D_LL	Methyl acetate	79-20-9	Groundwater	--	1	µg/L	--	--	8000	--	18000	8000
8260D_LL	Methyl tert-butyl ether	1634-04-4	Groundwater	0.07	0.3	µg/L	20	24	--	240	--	24
8260D_LL	Methylcyclohexane	108-87-2	Groundwater	--	0.2	µg/L	--	--	--	--	--	--
8260D_LL	Methylene Chloride	75-09-2	Groundwater	1.2	5	µg/L	5	5.8	48	220	110	5
8260D_LL	m-Xylene & p-Xylene	179601-23-1	Groundwater	0.115	0.5	µg/L	--	--	1600	--	3500	--
8260D_LL	o-Xylene	95-47-6	Groundwater	0.147	0.5	µg/L	--	--	1600	--	3500	1600
8260D_LL	Styrene	100-42-5	Groundwater	0.192	1	µg/L	--	--	1600	--	3500	100
8260D_LL	Tetrachloroethene	127-18-4	Groundwater	0.084	0.5	µg/L	5	21	48	210	110	5

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	MTCA Cleanup Level (a)					
							Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Target for Soil to Groundwater
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
8260D_LL	Toluene	108-88-3	Groundwater	0.05	0.2	µg/L	1000	--	640	--	1400	640
8260D_LL	trans-1,2-Dichloroethene	156-60-5	Groundwater	0.033	0.2	µg/L	--	--	160	--	350	100
8260D_LL	trans-1,3-Dichloropropene	10061-02-6	Groundwater	0.092	0.2	µg/L	--	--	--	--	--	--
8260D_LL	Trichloroethene	79-01-6	Groundwater	0.066	0.2	µg/L	5	0.54	4	9.5	8.8	4
8260D_LL	Trichlorofluoromethane	75-69-4	Groundwater	0.124	0.5	µg/L	--	--	2400	--	5300	2400
8260D_LL	Vinyl chloride	75-01-4	Groundwater	0.04	0.1	µg/L	0.2	0.029	24	0.29	53	0.29
8260D_SIM_AK	Vinyl chloride	75-01-4	Groundwater	0.003	0.02	µg/L	0.2	0.029	24	0.29	53	0.29
8270E_SIM_MS_ID	1,4-Dioxane	123-91-1	Groundwater	0.036	0.2	µg/L	--	0.44	240	4.4	530	0.44
NWTPH_Dx	#2 Diesel (C10-C24)	STL00163	Groundwater	65	110	µg/L	500	--	--	--	--	--
NWTPH_Dx	Motor Oil (>C24-C36)	STL00299	Groundwater	96	350	µg/L	500	--	--	--	--	--
NWTPH_Gx_MS	Gasoline	STL00228	Groundwater	14	50	µg/L	1000	--	--	--	--	--
8270E_LL	1-Methylnaphthalene	90-12-0	Groundwater	0.011	0.1	µg/L	--	0.86	560	8.6	1200	0.86
8270E_LL	2,3,4,6-Tetrachlorophenol	58-90-2	Groundwater	0.115	0.4	µg/L	--	--	480	--	1100	480
8270E_LL	2,4,5-Trichlorophenol	95-95-4	Groundwater	0.055	0.4	µg/L	--	--	1600	--	3500	1600
8270E_LL	2,4,6-Trichlorophenol	88-06-2	Groundwater	0.053	0.4	µg/L	--	8	16	80	35	7.95
8270E_LL	2,4-Dichlorophenol	120-83-2	Groundwater	0.009	0.4	µg/L	--	--	48	--	110	48
8270E_LL	2,4-Dimethylphenol	105-67-9	Groundwater	0.041	0.4	µg/L	--	--	320	--	700	320
8270E_LL	2,4-Dinitrophenol	51-28-5	Groundwater	1.19	5	µg/L	--	--	32	--	70	32
8270E_LL	2,4-Dinitrotoluene	121-14-2	Groundwater	0.014	0.25	µg/L	--	0.28	32	2.8	70	0.28
8270E_LL	2,6-Dinitrotoluene	606-20-2	Groundwater	0.015	0.05	µg/L	--	0.058	4.8	0.58	11	0.0583
8270E_LL	2-Chloronaphthalene	91-58-7	Groundwater	0.005	0.4	µg/L	--	--	640	--	1400	640
8270E_LL	2-Chlorophenol	95-57-8	Groundwater	0.003	0.05	µg/L	--	--	40	--	88	40
8270E_LL	2-Methylnaphthalene	91-57-6	Groundwater	0.012	0.1	µg/L	--	--	32	--	70	32
8270E_LL	2-Methylphenol	95-48-7	Groundwater	0.031	0.4	µg/L	--	--	800	--	1800	800
8270E_LL	2-Nitroaniline	88-74-4	Groundwater	0.013	0.4	µg/L	--	--	160	--	350	160
8270E_LL	2-Nitrophenol	88-75-5	Groundwater	0.055	0.4	µg/L	--	--	--	--	--	--
8270E_LL	3 & 4 Methylphenol	15831-10-4	Groundwater	0.036	0.8	µg/L	--	--	--	--	--	--
8270E_LL	3,3'-Dichlorobenzidine	91-94-1	Groundwater	0.707	3	µg/L	--	0.19	--	1.9	--	0.19
8270E_LL	3-Nitroaniline	99-09-2	Groundwater	0.023	0.4	µg/L	--	--	--	--	--	--
8270E_LL	4,6-Dinitro-2-methylphenol	534-52-1	Groundwater	0.273	1.5	µg/L	--	--	1.3	--	2.8	1.28
8270E_LL	4-Bromophenyl phenyl ether	101-55-3	Groundwater	0.007	0.4	µg/L	--	--	--	--	--	--
8270E_LL	4-Chloro-3-methylphenol	59-50-7	Groundwater	0.064	0.4	µg/L	--	--	1600	--	3500	1600
8270E_LL	4-Chloroaniline	106-47-8	Groundwater	0.008	0.1	µg/L	--	0.44	64	4.4	140	0.44
8270E_LL	4-Chlorophenyl phenyl ether	7005-72-3	Groundwater	0.01	0.4	µg/L	--	--	--	--	--	--
8270E_LL	4-Nitroaniline	100-01-6	Groundwater	0.013	0.4	µg/L	--	4.4	64	44	140	4.38
8270E_LL	4-Nitrophenol	100-02-7	Groundwater	0.295	1.5	µg/L	--	--	--	--	--	--
8270E_LL	Acenaphthene	83-32-9	Groundwater	0.006	0.1	µg/L	--	--	480	--	1100	480
8270E_LL	Acenaphthylene	208-96-8	Groundwater	0.008	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Acetophenone	98-86-2	Groundwater	0.062	0.4	µg/L	--	--	800	--	1800	800
8270E_LL	Anthracene	120-12-7	Groundwater	0.011	0.1	µg/L	--	--	2400	--	5300	2400
8270E_LL	Benzo[a]anthracene	56-55-3	Groundwater	0.006	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Benzo[a]pyrene	50-32-8	Groundwater	0.004	0.05	µg/L	0.1	0.023	4.8	0.88	11	0.2
8270E_LL	Benzo[b]fluoranthene	205-99-2	Groundwater	0.006	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Benzo[g,h,i]perylene	191-24-2	Groundwater	0.005	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Benzo[k]fluoranthene	207-08-9	Groundwater	0.006	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Bis(2-chloroethoxy)methane	111-91-1	Groundwater	0.003	0.4	µg/L	--	--	48	--	110	48
8270E_LL	Bis(2-chloroethyl)ether	111-44-4	Groundwater	0.006	0.05	µg/L	--	0.04	--	0.4	--	0.04
8270E_LL	Bis(2-ethylhexyl) phthalate	117-81-7	Groundwater	0.543	1.5	µg/L	--	6.3	320	63	700	6
8270E_LL	bis(chloroisopropyl) ether	108-60-1	Groundwater	0.041	0.4	µg/L	--	0.63	320	6.3	700	0.625
8270E_LL	Butyl benzyl phthalate	85-68-7	Groundwater	0.337	1.5	µg/L	--	46	3200	460	7000	46.05
8270E_LL	Carbazole	86-74-8	Groundwater	0.004	0.4	µg/L	--	--	--	--	--	--
8270E_LL	Chrysene	218-01-9	Groundwater	0.007	0.1	µg/L	--	--	--	--	--	--

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	MTCA Cleanup Level (a)					
							Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Target for Soil to Groundwater
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
8270E_LL	Dibenz(a,h)anthracene	53-70-3	Groundwater	0.005	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Dibenzofuran	132-64-9	Groundwater	0.008	0.4	µg/L	--	--	8	--	18	8
8270E_LL	Diethyl phthalate	84-66-2	Groundwater	0.055	0.4	µg/L	--	--	13000	--	28000	12800
8270E_LL	Dimethyl phthalate	131-11-3	Groundwater	0.057	0.4	µg/L	--	--	--	--	--	--
8270E_LL	Di-n-butyl phthalate	84-74-2	Groundwater	0.338	1.5	µg/L	--	--	1600	--	3500	1600
8270E_LL	Di-n-octyl phthalate	117-84-0	Groundwater	0.451	1.5	µg/L	--	--	160	--	350	160
8270E_LL	Fluoranthene	206-44-0	Groundwater	0.033	0.1	µg/L	--	--	640	--	1400	640
8270E_LL	Fluorene	86-73-7	Groundwater	0.009	0.1	µg/L	--	--	320	--	700	320
8270E_LL	Hexachlorobenzene	118-74-1	Groundwater	0.006	0.05	µg/L	--	0.027	6.4	0.27	14	0.27
8270E_LL	Hexachlorobutadiene	87-68-3	Groundwater	0.003	0.05	µg/L	--	0.56	8	5.6	18	0.56
8270E_LL	Hexachlorocyclopentadiene	77-47-4	Groundwater	0.012	0.4	µg/L	--	--	48	--	110	48
8270E_LL	Hexachloroethane	67-72-1	Groundwater	0.003	0.4	µg/L	--	1.1	5.6	11	12	1.09
8270E_LL	Indeno[1,2,3-cd]pyrene	193-39-5	Groundwater	0.005	0.05	µg/L	--	--	--	--	--	--
8270E_LL	Isophorone	78-59-1	Groundwater	0.007	0.4	µg/L	--	92	3200	920	7000	92.11
8270E_LL	Naphthalene	91-20-3	Groundwater	0.014	0.1	µg/L	160	--	160	--	350	160
8270E_LL	Nitrobenzene	98-95-3	Groundwater	0.007	0.05	µg/L	--	--	16	--	35	16
8270E_LL	N-Nitrosodi-n-propylamine	621-64-7	Groundwater	0.022	0.4	µg/L	--	0.013	--	0.13	--	0.0125
8270E_LL	N-Nitrosodiphenylamine	86-30-6	Groundwater	0.007	0.4	µg/L	--	18	--	180	--	17.86
8270E_LL	Pentachlorophenol	87-86-5	Groundwater	0.144	0.4	µg/L	--	0.22	80	2.2	180	1
8270E_LL	Phenanthrene	85-01-8	Groundwater	0.041	0.1	µg/L	--	--	--	--	--	--
8270E_LL	Phenol	108-95-2	Groundwater	0.042	0.4	µg/L	--	--	4800	--	11000	4800
8270E_LL	Pyrene	129-00-0	Groundwater	0.058	0.2	µg/L	--	--	240	--	530	240
8270E_LL	Pyridine	110-86-1	Groundwater	0.167	1.5	µg/L	--	--	8	--	18	8
8082A	DCB Decachlorobiphenyl	2051-24-3	Groundwater	0.021	0.1	µg/L	--	--	--	--	--	--
8082A	PCB-1016	12674-11-2	Groundwater	0.061	0.45	µg/L	--	0.63	0.56	6.3	1.2	0.56
8082A	PCB-1221	11104-28-2	Groundwater	0.075	0.45	µg/L	--	--	--	--	--	--
8082A	PCB-1232	11141-16-5	Groundwater	0.063	0.45	µg/L	--	--	--	--	--	--
8082A	PCB-1242	53469-21-9	Groundwater	0.059	0.45	µg/L	--	--	--	--	--	--
8082A	PCB-1248	12672-29-6	Groundwater	0.052	0.45	µg/L	--	--	--	--	--	--
8082A	PCB-1254	11097-69-1	Groundwater	0.075	0.45	µg/L	--	0.022	0.16	0.22	0.35	0.022
8082A	PCB-1260	11096-82-5	Groundwater	0.061	0.45	µg/L	--	0.022	--	0.22	--	0.022
6020B_LL	Aluminum	7429-90-5	Groundwater	5.78	40	µg/L	--	--	16000	--	35000	16000
6020B_LL	Antimony	7440-36-0	Groundwater	0.125	0.8	µg/L	--	--	6.4	--	14	6
6020B_LL	Arsenic	7440-38-2	Groundwater	0.204	1	µg/L	5	0.058	4.8	0.58	2.1	5
6020B_LL	Barium	7440-39-3	Groundwater	0.212	1.2	µg/L	--	--	3200	--	7000	2000
6020B_LL	Beryllium	7440-41-7	Groundwater	0.11	0.4	µg/L	--	--	32	--	70	4
6020B_LL	Cadmium	7440-43-9	Groundwater	0.037	0.4	µg/L	5	--	8	--	18	5
6020B_LL	Chromium	7440-47-3	Groundwater	0.173	0.8	µg/L	50	--	--	--	--	100
6020B_LL	Cobalt	7440-48-4	Groundwater	0.039	0.4	µg/L	--	--	4.8	--	11	4.8
6020B_LL	Copper	7440-50-8	Groundwater	0.603	2	µg/L	--	--	640	--	1400	640
6020B_LL	Iron	7439-89-6	Groundwater	13.3	100	µg/L	--	--	11000	--	25000	300
6020B_LL	Lead	7439-92-1	Groundwater	0.04	0.4	µg/L	15	--	--	--	--	15
6020B_LL	Manganese	7439-96-5	Groundwater	0.459	2	µg/L	--	--	750	--	1600	50
6020B_LL	Nickel	7440-02-0	Groundwater	0.125	3	µg/L	--	--	320	--	700	320
6020B_LL	Selenium	7782-49-2	Groundwater	2.06	8	µg/L	--	--	80	--	180	50
6020B_LL	Silver	7440-22-4	Groundwater	0.025	0.4	µg/L	--	--	80	--	180	80
6020B_LL	Thallium	7440-28-0	Groundwater	0.029	1	µg/L	--	--	0.16	--	0.35	0.16
6020B_LL	Vanadium	7440-62-2	Groundwater	0.456	4	µg/L	--	--	80	--	180	80
6020B_LL	Zinc	7440-66-6	Groundwater	0.928	7	µg/L	--	--	4800	--	11000	4800
6010D	Calcium	7440-70-2	Groundwater	76.7	500	µg/L	--	--	--	--	--	--
6010D	Magnesium	7439-95-4	Groundwater	47.4	500	µg/L	--	--	--	--	--	--
6010D	Sodium	7440-23-5	Groundwater	332	500	µg/L	--	--	--	--	--	--

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	MTCA Cleanup Level (a)					
							Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Target for Soil to Groundwater
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
7470A	Mercury	7439-97-6	Groundwater	0.15	0.3	µg/L	2	--	--	--	--	2
9060A	Total Organic Carbon	TOC	Groundwater	380	1500	µg/L	--	--	--	--	--	--
300.0_28D	Sulfate	14808-79-8	Groundwater	800	1500	µg/L	--	--	--	--	--	--
1633A	11-Chloroeicosafluoro-3-oxaundecane-	763051-92-9	Groundwater	0.500	2.00	µg/L	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorodecane sulfonic	39108-34-4	Groundwater	1.00	4.00	µg/L	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorohexane sulfonic	757124-72-4	Groundwater	1.00	4.00	µg/L	--	--	--	--	--	--
1633A	1H,1H,2H,2H-Perfluorooctane sulfonic	27619-97-2	Groundwater	1.00	4.00	µg/L	--	--	3.20	--	7.00	3.20
1633A	3-Perfluoroheptylpropanoic acid (7:3	812-70-4	Groundwater	2.50	10.0	µg/L	--	--	--	--	--	--
1633A	3-Perfluoropentylpropanoic acid (5:3	914637-49-3	Groundwater	2.50	10.0	ng/L	--	--	--	--	--	--
1633A	3-Perfluoropropylpropanoic acid (3:3	356-02-5	Groundwater	1.00	4.00	ng/L	--	--	--	--	--	--
1633A	4,8-Dioxa-3H-perfluorononanoic acid	919005-14-4	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	9-Chlorohexadecafluoro-3-oxanonane-	756426-58-1	Groundwater	0.580	2.00	ng/L	--	--	--	--	--	--
1633A	HFPO-DA (GenX)	13252-13-6	Groundwater	0.390	1.50	µg/L	--	--	0.024	--	0.053	0.01
1633A	N-ethylperfluorooctane sulfonamide	4151-50-2	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	N-ethylperfluorooctane	1691-99-2	Groundwater	2.50	10.0	ng/L	--	--	--	--	--	--
1633A	N-	2991-50-6	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	N-methylperfluorooctane sulfonamide	31506-32-8	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	N-methylperfluorooctane	24448-09-7	Groundwater	2.50	10.0	ng/L	--	--	--	--	--	--
1633A	N-methylperfluorooctanesulfonamidoace	2355-31-9	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Nonafluoro-3,6-dioxaheptanoic acid	151772-58-6	Groundwater	0.720	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoro (2-ethoxyethane) sulfonic	113507-82-7	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoro-3-methoxypropanoic acid	377-73-1	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoro-4-methoxybutanoic acid	863090-89-5	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorobutanesulfonic acid (PFBS)	375-73-5	Groundwater	0.500	2.00	ng/L	--	--	4.8	--	11	4.8
1633A	Perfluorobutanoic acid (PFBA)	375-22-4	Groundwater	1.00	4.00	ng/L	--	--	8.00	--	18.00	8.00
1633A	Perfluorodecanesulfonic acid (PFDS)	335-77-3	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorodecanoic acid (PFDA)	335-76-2	Groundwater	0.500	2.00	ng/L	--	--	0.000032	--	0.00007	0.0000320
1633A	Perfluorododecanesulfonic acid	79780-39-5	Groundwater	0.530	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorododecanoic acid (PFDoA)	307-55-1	Groundwater	0.550	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoroheptanoic acid (PFHpA)	375-85-9	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	Groundwater	0.500	2.00	ng/L	--	--	0.0000064	--	0.34	0.0000064
1633A	Perfluorohexanoic acid (PFHxA)	307-24-4	Groundwater	0.500	2.00	ng/L	--	--	8.00	--	18.00	8.00
1633A	Perfluorononanesulfonic acid (PFNS)	68259-12-1	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorononanoic acid (PFNA)	375-95-1	Groundwater	0.500	2.00	ng/L	--	--	0.04	--	0.088	0.01
1633A	Perfluorooctanesulfonamide (PFOSA)	754-91-6	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorooctanesulfonic acid (PFOS)	1763-23-1	Groundwater	0.500	2.00	ng/L	--	0.0022	0.0016	0.022	0.0035	0.004
1633A	Perfluorooctanoic acid (PFOA)	335-67-1	Groundwater	0.500	2.00	ng/L	--	0.000003	0.00048	0.00003	0.0011	0.004
1633A	Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoropentanoic acid (PFPeA)	2706-90-3	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorotetradecanoic acid (PFTeDA)	376-06-7	Groundwater	0.810	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluorotridecanoic acid (PFTrDA)	72629-94-8	Groundwater	0.580	2.00	ng/L	--	--	--	--	--	--
1633A	Perfluoroundecanoic acid (PFUnA)	2058-94-8	Groundwater	0.500	2.00	ng/L	--	--	--	--	--	--
1613B	1,2,3,4,6,7,8-HpCDD	35822-46-9	Groundwater	0.00000483	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,4,6,7,8-HpCDF	67562-39-4	Groundwater	0.00000667	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,4,7,8,9-HpCDF	55673-89-7	Groundwater	0.00000672	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,4,7,8-HxCDD	39227-28-6	Groundwater	0.00000666	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,4,7,8-HxCDF	70648-26-9	Groundwater	0.00000699	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,6,7,8-HxCDD	57653-85-7	Groundwater	0.0000067	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,6,7,8-HxCDF	57117-44-9	Groundwater	0.00000702	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,7,8,9-HxCDD	19408-74-3	Groundwater	0.00000744	0.00005	µg/L	--	0.000014	--	0.00014	--	--

METHOD	ANALYTE	CAS No.	MATRIX	MDL (b)	MRL (b)	UNITS	MTCA Cleanup Level (a)					
							Method A	Method B (Cancer)	Method B (Noncancer)	Method C (Cancer)	Method C (Noncancer)	Target for Soil to Groundwater
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
1613B	1,2,3,7,8,9-HxCDF	72918-21-9	Groundwater	0.0000184	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,7,8-PeCDD	40321-76-4	Groundwater	0.00000606	0.00005	µg/L	--	--	--	--	--	--
1613B	1,2,3,7,8-PeCDF	57117-41-6	Groundwater	0.0000075	0.00005	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,4,6,7,8-HpCDD	109719-83-7	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,4,6,7,8-HpCDF	109719-84-8	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,4,7,8,9-HpCDF	109719-94-0	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,4,7,8-HxCDD	109719-80-4	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,4,7,8-HxCDF	114423-98-2	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,6,7,8-HxCDD	109719-81-5	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,6,7,8-HxCDF	116843-03-9	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,7,8,9-HxCDF	116843-04-0	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,7,8-PeCDD	109719-79-1	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-1,2,3,7,8-PeCDF	109719-77-9	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-2,3,4,6,7,8-HxCDF	116843-05-1	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-2,3,4,7,8-PeCDF	116843-02-8	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-2,3,7,8-TCDD	76523-40-5	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-2,3,7,8-TCDF	89059-46-1	Groundwater	--	0.002	µg/L	--	--	--	--	--	--
1613B	13C-OCDD	114423-97-1	Groundwater	--	0.004	µg/L	--	--	--	--	--	--
1613B	13C-OCDF	109719-78-0	Groundwater	--	--	µg/L	--	--	--	--	--	--
1613B	2,3,4,6,7,8-HxCDF	60851-34-5	Groundwater	0.00000538	0.00005	µg/L	--	--	--	--	--	--
1613B	2,3,4,7,8-PeCDF	57117-31-4	Groundwater	0.00000696	0.00005	µg/L	--	--	--	--	--	--
1613B	2,3,7,8-TCDD	1746-01-6	Groundwater	0.00000371	0.00001	µg/L	--	0.00000034	0.0000056	0.0000034	0.000012	0.0000034
1613B	2,3,7,8-TCDF	51207-31-9	Groundwater	0.00000125	0.00001	µg/L	--	--	--	--	--	--
1613B	37Cl4-2,3,7,8-TCDD	85508-50-5	Groundwater	0.0004	0.002	µg/L	--	--	--	--	--	--
1613B	OCDD	3268-87-9	Groundwater	0.000015	0.0001	µg/L	--	--	--	--	--	--
1613B	OCDF	39001-02-0	Groundwater	0.000013	0.0001	µg/L	--	--	--	--	--	--
1613B	Total HpCDD	37871-00-4	Groundwater	0.00000483	0.00005	µg/L	--	--	--	--	--	--
1613B	Total HpCDF	38998-75-3	Groundwater	0.00000672	0.00005	µg/L	--	--	--	--	--	--
1613B	Total HxCDD	34465-46-8	Groundwater	0.00000744	0.00005	µg/L	--	0.000014	--	0.00014	--	0.0000141
1613B	Total HxCDF	55684-94-1	Groundwater	0.00000702	0.00005	µg/L	--	--	--	--	--	--
1613B	Total PeCDD	36088-22-9	Groundwater	0.00000606	0.00005	µg/L	--	--	--	--	--	--
1613B	Total PeCDF	30402-15-4	Groundwater	0.0000075	0.00005	µg/L	--	--	--	--	--	--
1613B	Total TCDD	41903-57-5	Groundwater	0.00000371	0.00001	µg/L	--	0.00000034	0.0000056	0.0000034	0.000012	--
1613B	Total TCDF	55722-27-5	Groundwater	0.00000125	0.00001	µg/L	--	--	--	--	--	--
1671A_UP	Dimethyl sulfoxide	67-68-5	Groundwater	20000	20000	µg/L	--	--	--	--	--	--
9034	Sulfide	18496-25-8	Groundwater	700	2000	µg/L	--	--	--	--	--	--

Notes

-- = not established
NA = not available
µg/L = micrograms per liter
MDL = method detection limit
MRL - method reporting limit
(a) Ecology's Cleanup Levels and Risk Calculations (CLARC) last updated in February 2025. Accessed April 2025.
(b) MDLs and reporting limits provided by Eurofins in March 2023, except for Method 1633A (provided by Eurofins in February 2025). If a different laboratory is used, reporting limits will be requested from that laboratory.
(c) Method 1613B, Dioxins and Furans: MDL column values are EDLs (estimated detection limits).

APPENDIX A-1
Health and Safety Plan

Prepared for

Georgia-Pacific Consumer Operations LLC
401 NE Adams Street
Camas, Washington 98607

HEALTH AND SAFETY PLAN

CAMAS MILL – REMEDIAL INVESTIGATION WORK PLAN FOR UPLAND AREAS AND SEDIMENTS

Prepared by

Geosyntec consultants

engineers | scientists | innovators

920 SW 6th Avenue, Suite 600
Portland, Oregon, 97204

Project Number: AS130290L/02B

August 4, 2025

Geosyntec consultants

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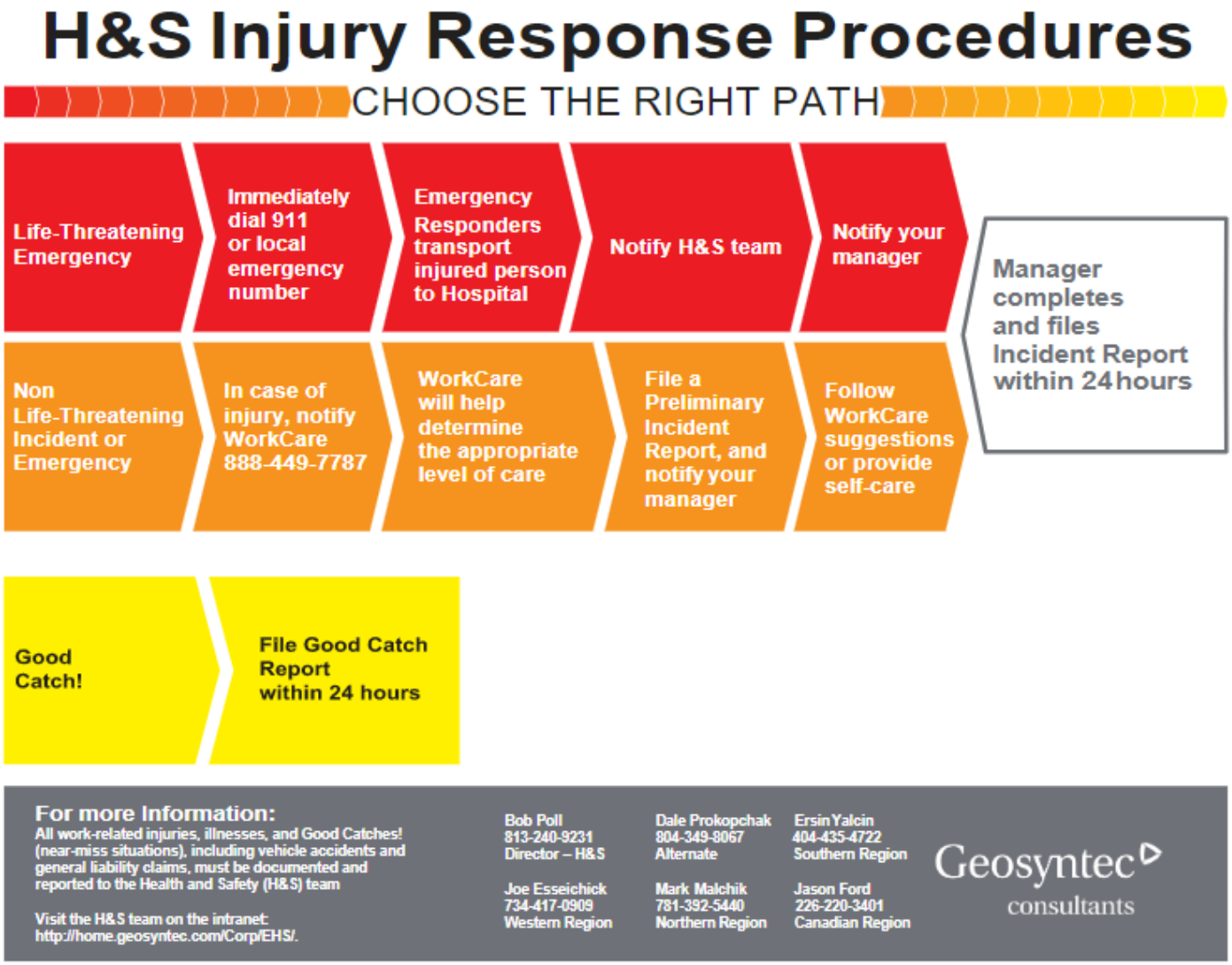
Attachment C: Summary of Chemical Hazards

Attachment D: Air Monitoring

Attachment E: Personal Protective Equipment

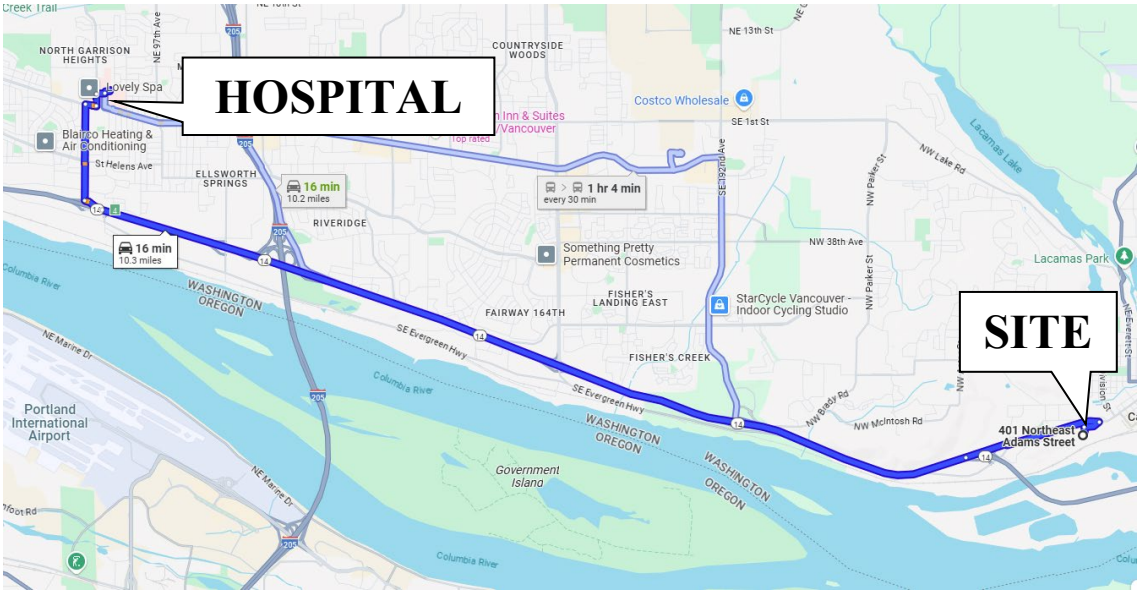
Attachment F: Safety Data Sheets

H&S INCIDENT RESPONSE PROCEDURES



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ROUTE TO HOSPITAL



PEACE HEALTH SOUTHWEST MEDICAL CENTER
(360) 729-8370

400 NE Mother Joseph Place

Vancouver, WA 98664

DIRECTIONS TO HOSPITAL FROM SITE

Get on WA-14 from NW 6th Avenue (4 minutes [min], 1.4 miles [mi])

Head north toward NW 6th Avenue (371 feet [ft])

Turn right (0.1 mi)

Turn left onto NW 6th Avenue (0.8 mi)

At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Follow WA-14 W to South Lieser Road in Vancouver. Take exit 4 from WA-14 W (8 min, 7.8 mi)

Merge onto WA-14 W (7.6 mi)

Take exit 4 for Lieser Road toward SE 88th Avenue (0.2 mi)

Continue on South Lieser Road. Drive to NE Mother Joseph Place (4 min, 1.1 mi)

Turn right onto South Lieser Road (0.8 mi)

Turn right onto East Mill Plain Boulevard (489 ft)

Use the 2nd from the left lane to turn left onto NW 87th Avenue (0.1 mi)

Turn right toward NE Mother Joseph Place (367 ft)

Turn left toward NE Mother Joseph Place (335 ft)

Geosyntec consultants

ROUTE TO URGENT CARE FACILITY



LEGACY-GO HEALTH URGENT CARE

(360) 216-4525

3425 SE 192nd Avenue, Suite 106, Vancouver, WA 98683

DIRECTIONS TO URGENT CARE FACILITY FROM SITE

Continue to NW 6th Avenue (1 min, 0.2 mi)

Head north toward NW 6th Avenue (371 ft)

Turn right (0.1 mi)

Drive from WA-14 W and SE 192nd Avenue to Vancouver

Turn left onto NW 6th Avenue (0.8 mi)

At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Merge onto WA-14 W (1.8 mi)

Take exit 10 for SE 192nd Avenue (0.2 mi)

Turn right onto SE 192nd Avenue (0.8 mi)

Drive to SE 41st Drive (2 min, 482 ft)

Turn right toward SE 41st Drive (154 ft)

Turn right toward SE 41st Drive (121 ft)

Turn left toward SE 41st Drive (167 ft)

Turn right onto SE 41st Drive (39 ft)

Geosyntec
consultants

1. INTRODUCTION

This site-specific Health and Safety Plan (HASP) was prepared to address project-specific hazards known or suspected to be present associated with the existing conditions and work to be performed at the work site(s). This HASP was prepared to meet the requirements specified in Occupational Safety and Health (OSHA) Hazardous Waste Operations Emergency and Response (HAZWOPER) program, Geosyntec Consultants, Inc.'s (Geosyntec) Health and Safety (H&S) Procedure HS 301, and the H&S requirements of the client.

2. SIGNATURES

2.1 Preparers and Reviewers

This HASP must be maintained on-site when field work is being performed. The Site Health and Safety Officer (SHSO) can change or amend this document, in agreement with the Health and Safety Coordinator (HSC) or Project Manager (PM). Amendments (e.g., changes in personal protective equipment, addition of tasks, etc.) must be documented in Section 19 and in Appendix A. This HASP must be reviewed and amended on an annual basis for projects lasting more than one year.

Prepared by:



7/7/2025

Jensen Perrick
Senior Staff Scientist

Date

Reviewed by:



7/7/2025

Andrew James
H&S Professional

Date

Approved by:

DRAFT

Project Manager

Date

This HASP has been given to the following H&S approved subcontractor(s).

Subcontractor	Representative	Date
Subcontractor	Representative	Date
Subcontractor	Representative	Date

2.2 Site Workers

This HASP must be reviewed by personnel prior to site work. Workers not in attendance at the initial meeting must be trained by the SHSO on the information covered in the pre-entry briefing. After reading the HASP and attending a pre-entry briefing, Geosyntec employees and other parties covered under this HASP must sign the following acknowledgment statement.

"I have read, understand, and will perform my work in accordance with the information set forth in this HASP."

Signature	Printed Name	Date

3. EMERGENCY CONTACT INFORMATION

Contact	Telephone Numbers	
	Office	Alternate (Type)
Fire Department	(360) 834-6864	911
Police Department	(360) 834-4151	911
Site Emergency Response (GP Mill)	(360) 834-8118	
Hospital – Peace Health Southwest Medical Center	(360) 729-8370	911
Director of H&S – Bob Poll, CIH, CSP	(813) 379-4420	(813) 240-9231 (Cell)
H&S Regional Manager – Madison McLaughlin	(858) 716-2900	(951) 990-2888 (Cell)
Project Manager – Tim Flynn	(206) 780-7730	-
Site Health & Safety Officer – Erin Dunbar	(971) 271-5916	(971) 469-3080 (Cell)
H&S Coordinator – Madeline Solimano	(206) 496-1463	(206) 499-6773 (Cell)
Principal – Cindy Bartlett	(971) 271-5895	(503) 505-4145 (Cell)
Utility Emergencies	811	-
EthicsPoint	(844) 231-3371	-
WorkCare	(888) 449-7787	-
Facility Contact – Spencer Giles	(971) 293-7569	-
Client Contact – Samantha McDowell	(360) 834-8439	-
WA OSHA	(206) 757-6677	

4. APPLICABILITY OF THIS HASP

This HASP was prepared in accordance with Geosyntec's H&S Procedures for use by Geosyntec project staff and subcontractors. Subcontractors, at a minimum, shall ensure that their employees, and those of its lower tier subcontractors, comply with these procedures and other health, safety, and security provisions in the Subcontract. Compliance with this HASP shall represent the minimum requirements to be met by subcontractors, who shall be responsible for examining all requirements and determining whether additional or more stringent health, safety, and security provisions are appropriate for their portion of the work and implementing them accordingly. Therefore, for firms executing all or any portion of the work, this document and its contents should not be used without a thorough peer review by their health and safety managers. Prior to commencing work, such firms are responsible for reviewing and supplementing the HASP to add appropriate procedures specific to their portion of the work.

5. -SITE/TASK/HAZARD DESCRIPTION

5.1 Site Background

The following is a brief description of the site, including information as to the location, approximate size, previous usage, and current usage. A description of the tasks to be performed is also presented.

Site Location:	401 NE Adams Street, Camas, WA 98607
Approximate Size of Site:	661 acres
Previous Site Usage:	Paper milling, ship manufacturing, wood pulping, fine paper converting
Current Site Usage:	Paper making

Description of Surrounding Property/Population:

North:	NW 6th Avenue	**East:**	City of Camas
South:	Camas Slough	**West:**	WA-14 (Lewis & Clark Highway)

Summary of Previous Site Investigations (if available/applicable):

Previous site investigations conducted at the Mill Property are summarized in Section 3 of the *Agency Review Revised Draft Remedial Investigation Work Plan for Upland Areas*.

5.2 Task Descriptions

Task 1: Prefield Activities

Prior to any subsurface work beginning, a utility survey will be conducted at each proposed subsurface sampling or well location to assess the presence of underground utilities. This survey will supplement information provided by Georgia-Pacific (GP) and involve coordination with the Washington Utility Notification Center for public property, GP for site-specific utility data, and a private utility locator for private property. Advanced techniques, such as Time Domain Electromagnetic Induction (TDEM) and Ground Penetrating Radar (GPR) may be used, along with tools like an air-knife to detect underground lines. If necessary, boring or well locations will be adjusted in the field to avoid conflicts with utilities.

Task 2: Noninvasive Exploration

An extensive network of buried utilities and other subsurface features is expected at the Mill site. To enhance understanding before any intrusive work, noninvasive exploration methods will be used alongside a private utility locate. Two key areas (the Mill Modernization Debris Area and the Buried Material Area in Mill Operational Unit [MOU] C) will be investigated to determine the nature and extent of suspected buried debris. In addition, noninvasive methods will help locate a pipeline from the Primary Clarifier to the South aerated stabilization basin (ASB) on Lady Island to support soil sampling efforts. Geophysical surveys using TDEM and GPR will be conducted in accessible areas, following a grid pattern. The choice of method will depend on site-specific factors, such as nearby metallic structures and operational accessibility.

Task 3: Drilling and Well Installation

GP plans to install 37 monitoring wells at the Mill Property. The installation will occur in phases due to operational constraints and safety concerns. The first phase includes 12 wells strategically placed to assess groundwater flow directions and gradients, with monitoring during both low and high groundwater seasons. Subsequent wells will be installed based on findings from the initial phase, particularly near areas with known chemical use or spills. Wells will be installed using sonic drilling to a depth of about 10 feet below the shallow groundwater table, with at least one boring per MOU reaching bedrock or the top of the Troutdale Gravel Aquifer (TGA). Field conditions will guide final depths and well construction details. Select borings will be advanced to refusal to estimate saturated intervals. All wells will be developed, surveyed, and constructed in accordance with Washington state standards. If accessible, Mill Production Well #12 will also be included in the monitoring program.

Task 4: Soil Sampling

The soil sampling program at the Mill Property is designed to support both the installation of monitoring wells and to address data gaps related to contaminants, such as polychlorinated biphenyls (PCBs) and dioxins/furans. During monitoring well installation, sonic drilling will be used to retrieve continuous core samples, which will be field screened for visual, olfactory, and instrumental indicators of contamination. Approximately one soil sample per 5 feet will be retained, with priority given to samples showing signs of impact, those near the surface in spill-prone areas, at the shallow water table, and at the bottom of borings. At least two samples per location will be analyzed for contaminants of potential concern (COPCs), as outlined in Table 7.

In addition to well-related sampling, targeted soil sampling will be conducted in static, accessible areas with a history of industrial activity. Four collection methods will be used: surface scraping, shallow sampling (0–1 ft below ground surface [bgs]), test pit sampling, and deeper sampling within former wastewater ditches. Surface soil samples will be collected at inactive substations using hand tools, with final locations selected based on field observations of staining or odors. Shallow soil samples will be collected using hand tools or push-probes, with two samples per location representing 0–0.5 ft and 0.5–1 ft bgs. In the Dredge Spoils Area, four samples will be collected from stockpiles. At select locations near the PECO crane dock in Operational Area (OA) A1, three samples will be collected to support regrading efforts: one from 0–1 ft bgs, one at the proposed final grade, and one from approximately 1 ft below the final grade.

In addition, six soil samples are proposed along the Former Wastewater Ditches on Lady Island, spaced approximately every 500 feet. These ditches were historically backfilled, and sampling will focus on identifying the transition from fill to original ditch bottom material, expected around 5 feet bgs. Samples will be collected using a hand auger or direct-push rig, with field screening and logging to characterize the fill and underlying materials. Sampling will be offset from the existing pipeline and conducted during dry conditions to avoid standing water. All samples will be collected using decontaminated or disposable equipment and placed directly into lab-supplied containers for analysis.

Task 5: Groundwater Monitoring

Following well development, water levels in the newly installed monitoring wells will be measured using a depth-to-water meter or interface probe, following procedures outlined in Appendix A. Groundwater samples will then be collected from these wells and Mill Production Well #12 using low-flow sampling methods, either a peristaltic or bladder pump, depending on groundwater depth. These samples will be analyzed for COPCs listed in Table 6. After the initial sampling, groundwater will be monitored quarterly for 1 year using the same methods.

Ongoing groundwater monitoring will continue at existing wells in accordance with permit requirements, such as those at the Lady Island Landfill (LILF) and Lady Island sites. Additional analyses may be added to existing wells, and sampling at CBC wells will align with the new monitoring schedule. Given the site's proximity to the Columbia and Washougal Rivers, water level data from the wells will be compared to river stage data from three stations: U.S. Geological Survey (USGS) Station 14144700 at Vancouver (13 miles downstream), USGS Station 14128870 at Bonneville Dam (24 miles upstream), and Washington State Department of Ecology (Ecology) Station 28B080 on the Washougal River at Hathaway Park (3 miles upstream), to assess potential river influence on groundwater conditions.

Task 6: Test Pits

Based on the interpretation of geophysical survey results, test pits will be excavated in the Buried Material Area and AREA 2 to further investigate subsurface conditions. While proposed locations are shown on Figure 32, final sampling points will be determined in the field based on observations and documented accordingly. Each test pit will be excavated up to 5 feet deep and 2 feet wide using a small excavator. One soil sample will be collected from the bottom of each pit, with additional samples taken at varying depths, if field conditions suggest potential impacts. Samples will be collected directly from the excavator bucket. After sampling and visual documentation of soil characteristics, the excavated material will be returned to the pit. A certified hazardous building materials inspector will be present during test pit activities in areas suspected to contain buried materials.

Task 7: Seep, Sediment, and Stormwater Sampling

In addition to soil and groundwater sampling, the investigation includes monitoring and analysis of seeps, sediments (surface and subsurface), and stormwater and catch-basin solids. These media are already part of existing monitoring programs and will continue to be monitored under those frameworks, with results incorporated into the Remedial Investigation (RI) Report. Although seeps have been identified on Lady Island, none have been observed during annual monitoring from 2019 to 2024. If a seep is observed in the future, Ecology will be notified, and a specific evaluation plan will be developed.

Sediment sampling is conducted under the facility's Waste Discharge Permit, with past samples from Outfalls 001 and 002 showing no exceedances of Sediment Management Standards (SMS) chemical criteria. Dioxins were either not detected or detected below reportable limits. Stormwater is managed through the facility's wastewater treatment plant and monitored under the National Pollutant Discharge Elimination System (NPDES) permit, which includes oversight of stormwater and associated solids. These ongoing programs are considered representative of potential impacts from Mill operations and will be evaluated alongside RI field data.

Task Hazard Analyses (THAs) associated with these tasks are presented in Appendix B.

5.3 Chemical Hazards

The classes of chemicals that are known or suspected to be present that may be encountered while performing site work include the following:

Chemical of Concern	Groundwater	Soil
Dioxins/Furans (D/F)	X	X
Perfluoro Sulfonic Acid (PFOS)/ Perfluorooctanoic Acid (PFOA)	X	
Gasoline-Range Total Petroleum Hydrocarbons (TPH)	X	X

Diesel- and Heavy Oil-Range Petroleum Hydrocarbons (DRO, ORO)	X	X
Metals	X	X
Volatile Organic Compounds (VOCs)	X	X
Semivolatile Organic Compounds (SVOCs)	X	X
Diphenyl	X	X
Polychlorinated Biphenyls (PCBs)	X	X
Polycyclic Aromatic Hydrocarbons (PAHs)	X	X

Controls for these hazards are presented in the THAs included in Appendix B. A summary of these chemical hazards is presented in Appendix C.

5.4 Physical Hazards

The following physical hazards have been identified associated with the work to be performed and the site conditions.

- Heavy equipment
- Excavations and trench work
- Tripping and falling hazards
- Heat stress
- Cold exposure
- Underground/overhead utilities
- Motor vehicle hazards
- Equipment hazards
- Working over or near open water

- Chemical exposure

Controls for these hazards are presented in the THAs included in Appendix B.

5.5 Biological Hazards

The following biological hazards have been identified associated with the work to be performed and the site conditions.

- Biting/mauling animals (dogs, cats, etc.)
- Biting/stinging insects
- Rats/vermin
- Snakes
- Poisonous plants

Controls for these hazards are presented in the THAs included in Appendix B.

6. GENERAL SAFE WORK PRACTICES

The following general safe work practices must be adhered to while performing site work:

- Basic personal protective equipment (PPE) shall be worn, including hard hats, safety glasses, hard-toed boots, and high-visibility vests. If conditions allow, the requirement for hard hats and hard-toed boots may be reduced with approval of the SHSO and PM.
- Minimize contact with impacted materials. Do not place equipment on the ground. Do not sit or kneel on potentially contaminated surfaces.
- Smoking, eating, or drinking after entering the work zone and before personal decontamination is not allowed. Employees who are suspected of being under the influence of illegal drugs or alcohol will be removed from the site. Workers taking prescribed medication that may cause drowsiness shall not operate heavy equipment and are prohibited from performing tasks where Level C or B PPE is required.
- Practice good housekeeping.
- Use of contact lenses is not allowed under certain hazardous working conditions.

- The following conditions must be observed when operating a motor vehicle:
    - Wearing of seat belts is mandatory.
    - The use of headlights is mandatory during periods of rain, fog, or other adverse weather or low-light conditions.
    - A backup warning system or use of vehicle horn is mandatory when the vehicle is engaged in a backward motion.
    - Posted traffic signs and directions from flaggers must be observed.
    - Equipment and/or samples transported in vehicles must be secured from movement.
    - The use of vehicles acquired by Geosyntec by non-Geosyntec personnel is prohibited.
- In an unknown situation, always assume the worst reasonable conditions.
- Be observant of your immediate surroundings and the surroundings of others. It is a team effort to notice and warn of dangerous situations. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.
- Conflicting situations may arise concerning safety requirements and working conditions. These must be addressed and resolved rapidly by the SHSO and PM to relieve motivations or pressures to circumvent established safety policies.
- Unauthorized breaches of specified safety protocol are not allowed. Workers unwilling or unable to comply with established procedures will be asked to leave the work site.

7. EMERGENCY RESPONSE

This section discusses emergency response procedures and response equipment to be maintained on-site. A table presenting a list of contacts and telephone numbers for the

applicable local and off-site emergency responders is provided inside the front cover of this HASP (after figures).

7.1 Injury and Emergency Response Procedures

In the event of an **injury** to an employee, the instructions for injury response and reporting, located in the front of this HASP, must be implemented immediately. In the event that an **emergency** develops, the following procedures are to be implemented:

- The SHSO, or designated alternate, should be immediately notified via the on-site communication system. The SHSO assumes control of the emergency response.
- If applicable, the SHSO must immediately notify off-site emergency responders (e.g., fire department, hospital, police department, etc.) and must inform the response team of the nature and location of the emergency on-site.
- If applicable, the SHSO may call for evacuation of the site. Site workers should move to their respective refuge stations using the evacuation routes provided on the Site Map.
- For small fires, flames should be extinguished using the appropriate type of fire extinguisher. Large fires should be handled by the local fire department.
- If a worker is injured, the procedures presented in "Instructions for Injury Response," located in the front of this HASP, must be implemented immediately.
- After an incident has stabilized, the procedures presented in "Instructions for Incident Reporting," located in the front of this HASP, must be followed.

7.2 Emergency Response Equipment

Emergency response equipment will be maintained in the work area, as necessary, for this project. Examples of emergency response equipment include first aid kits, fire extinguishers (Type ABC), and eyewash bottles.

8. KEY PERSONNEL AND HEALTH AND SAFETY RESPONSIBILITIES

Project personnel and their responsibilities in regard to health and safety concerns on this project are:

Project Manager (PM): **Tim Flynn**

- Approve this HASP and amendments, if any;
- Monitor the field logbooks for health and safety work practices employed;
- Coordinate with SHSO so that emergency response procedures are implemented;
- Check that corrective actions are implemented;
- Check and document that qualified personnel receive this plan and are aware of its provisions and potential hazards associated with site operations, and that they are instructed in safe work practices and familiar with emergency response procedures; and
- Provide for appropriate monitoring, PPE, and decontamination materials.

Site Health and Safety Officer (SHSO): **Erin Dunbar**

- Prepare and implement project HASP and amendments, if any, and report to the PM for action if deviations from the anticipated conditions exist and authorize the cessation of work if necessary;
- Check that site personnel meet the training and medical requirements;
- Conduct pre-entry briefing and daily tailgate safety meetings;
- Check that monitoring equipment and PPE are operating correctly according to manufacturer's instructions and such equipment is utilized by on-site personnel. Calibrate or check calibration of monitoring equipment and record results;
- Check that decontamination procedures are being implemented;
- Implement site emergency response and follow-up procedures;
- Notify the HSC in the event an emergency occurs; and
- Perform and document weekly inspections.

Health & Safety Coordinator: **Madeline Solimano**

- Review and audit HASP and amendments;
- Notify Director of H&S when an emergency occurs;
- Assist with the implementation of the corporate health and safety program; and
- Consult with staff on health and safety issues.

Site Workers: **Various**

- Provide verification of required health and safety training and medical surveillance prior to arriving at the site;
- Notify supervisors of workplace accommodation requirements as the result of physical limitations or medical conditions;
- Attend pre-entry briefings and daily tailgate safety meetings;
- Immediately report accidents and/or unsafe conditions to the SHSO;
- Be familiar with and abide by the HASP; and
- Be ultimately responsible for his or her own safety.

9. WORKER TRAINING AND MEDICAL SURVEILLANCE

Personnel involved in field activities subject to OSHA HAZWOPER 29 Code of CFR 1910.120 will be required to participate in both a health and safety training program that complies with criteria primarily set forth by the OSHA HAZWOPER in 29 CFR 1910.120(e) and a medical surveillance program covered under 29 CFR 1910.120(f), or equivalent regulations based on the jurisdiction in which the project is performed.

9.1 Pre-Assignment and Annual Refresher Training

Prior to arrival on-site, the Geosyntec PM will be responsible for monitoring that their staff meet the requirements of pre-assignment training (40/24 hours per Procedure HS 301). In addition, personnel must be able to document dates of attendance at an annual 8-hour refresher and 3 days of fieldwork under a qualified supervisor. Failure to provide this documentation will prohibit entry to the active work area(s) (i.e., Exclusion Zone).

9.2 Site Supervisor Training

Consistent with OSHA 29 CFR 1910.120 (e)(4), prior to arrival on-site, individuals designated as site supervisors require an additional eight hours of specialized training.

9.3 Initial Site Safety Orientation and HASP Review

In addition to complying with 29 CFR 1910(e), site personnel will attend an initial safety orientation during which the HASP and applicable THAs will be reviewed prior to initiating field activities. This review will include:

- Understanding the lines of authority regarding health and safety and site personnel roles and responsibilities;
- Information of specific hazard agents related to the site and site operations will be discussed, such as health hazards of site chemicals and specific safety hazards of processes, tools, and equipment;
- Training in the proper use, maintenance, and decon protocol of PPE and Level(s) of Protection;
- Appropriate work practices and engineering controls to reduce/eliminate exposures to site hazards will be reviewed;
- Personnel will be informed of means for normal site and emergency communication(s);
- Air monitoring strategies will be discussed to include the frequency/types, action levels, sampling techniques, pre-/postcalibration techniques;
- Unique/site specific medical surveillance requirements that need to be considered based on site contaminants;
- Understanding site control measures, work zones, and proper decontamination procedures for personnel/tools/vehicles, etc. to reduce the potential for both on-/off-site contamination;
- Personnel will be trained to respond quickly and properly in the event of an emergency; and
- Personnel involved in specific hazardous activities, such as confined space entry, drum handling, sampling unknowns, etc. will receive specialized training in the appropriate techniques to employ prior to commencing these operations.

9.4 Baseline Medical Surveillance Exam

The baseline medical examination is used to identify physical capabilities and certain medical limitations that may have an impact on the candidate's ability to perform in the position and/or job activity for which he/she is being considered, as well as to establish certain baseline medical parameters. The initial test results can then be compared against future periodic or project-specific monitoring results.

9.5 Periodic/Annual/Biennial Medical Exam

The periodic medical examination is used to evaluate an employee's continued fitness for duty and to assess possible impact(s) occupational exposures may have had on their health status. The periodic examination includes an update to the medical and work history, results of previous occupational exposure assessments, and a detailed medical exam tailored to the job description.

The Medical Director from WorkCare determines the frequency of the periodic medical exams based on regulatory requirements, the position/work activities of the employee, and the level of exposure to physical, chemical, and biological agents.

9.6 Exposure/Activity/Project-Specific Medical Testing

Exposure-specific medical tests and/or evaluation of biological indices may be conducted to establish a baseline for certain project-specific parameters, to monitor the effectiveness of hazard controls, and/or to assess the impact of occupational exposures associated with a particular work activity or project. The Medical Director, in coordination with the H&S Department, will require or recommend an exposure-specific exam when deemed appropriate based on knowledge of project hazards, occurrence of employee health symptoms, or an unexpected exposure event. Requests for exposure-specific examinations will be forwarded to the H&S Department, who will process the requests in collaboration with the Medical Director. The Medical Director will determine the type and frequency of the exposure-specific medical exams for employees designated to participate based on sound medical practice, latest toxicology information, and current regulatory requirements.

9.7 Exit Exam

An exit medical examination is offered when an employee leaves the medical surveillance program, either because of termination of employment with Geosyntec or because of reassignment to a position not designated or identified to participate in the medical surveillance program. This optional exit examination may be used to assess potential changes in medical status that have occurred during the course of employees' previous work activities, and to establish a medical baseline at the time of departure.

9.8 Exit/Termination

An exit medical examination is offered when an employee leaves the medical surveillance program, either because of termination of employment with Geosyntec or because of reassignment to a position not designated or identified to participate in the medical surveillance program. This optional exit examination assesses potential adverse impacts occupational exposures may have contributed to the employee's health status.

10. MAPS AND SITE CONTROL

10.1 Routes to Hospital and Urgent Care Facility

A hospital and an urgent care facility near the site have been identified. Maps to the hospital and urgent care are included after the Table of Contents of this HASP. Both figures also include the facility name and phone number.

10.2 Site Map

A site map is located inside the cover of this HASP. The site map is intended to show the location of the work zone(s), to provide on-site orientation, and to delineate evacuation routes. Changes may be made to the site map by the SHSO based on changing site conditions. The site map should be accessible in the work area.

10.3 Buddy System

The buddy system is required when work is performed in hazardous areas. The buddy system includes maintaining regular contact with one or more on-site Geosyntec personnel, clients, and/or contractors to periodically check on the condition of site workers such that each employee in the work group is observed by (or in verbal contact with) at least one other employee in the work group. For field visits with only one

employee on-site, the buddy system shall be implemented via periodic telephone contact with off-site Geosyntec personnel. The purpose of the buddy system is to provide rapid assistance to employees in the event of an emergency.

10.4 Controlled Work Zones

☐ APPLICABLE ☐ NOT APPLICABLE

☒ Other: On an as-needed basis, determined by project needs, site conditions, the H&S Coordinator, and Project Manager.

Three controlled work zones, including an Exclusion Zone, a Contaminant Reduction Zone (CRZ), and a Support Zone, are required for the task(s) indicated above. Geosyntec employees must not be allowed into the CRZ or Exclusion Zone or the Work Zone until they have received the proper PPE and they have read, understand, and meet the requirements outlined in this HASP. The Exclusion Zone is defined as the area on-site where contamination is suspected, and tasks are to be performed. The CRZ is defined as the area where equipment and workers are to be decontaminated as they leave the Exclusion Zone. The Support Zone is defined as the command area and may serve as a staging and storage area for supplies. The location and extent of the work zones may be modified, as necessary, as site investigation information becomes available. For sites that do not require the three controlled work zones, the area(s) where work is to be performed shall be called the Work Zone.

Visitors to the site may need to be continually escorted for safety purposes. Visitors under Geosyntec's direction need to check in with the SHSO upon visiting the site.

For the tasks identified above, the boundaries of the Exclusion Zone, CRZ, and Support Zone, or the Work Zone, shall be marked using appropriate methods, including but not limited to warning tape, signs, traffic cones, fencing, or other appropriate means.

10.5 Site Access

Certain sites require controlled access to the work area. Examples of access controls include sign in/sign out logs, checking in with guards, and donning identification badges. Geosyntec personnel will adhere to the site-specific access requirements and monitor that subcontractors and other Geosyntec visitors abide by site-specific access control requirements.

10.6 Inspections

☒ APPLICABLE ☐ NOT APPLICABLE

Based on the hazards identified for the project, periodic health and safety inspections may be performed. The H&S Inspection Checklist records should be kept on file at the project site. The frequency for periodic inspections is:

☐ Weekly

☐ Monthly

☒ Other: On an as-needed basis, determined by the H&S Coordinator or Project manager.

11. TAILGATE MEETINGS

Tailgate meetings must be held daily prior to starting work to discuss important health and safety issues concerning tasks to be performed during that shift. Non-Geosyntec site workers should also communicate health and safety concerns associated with the tasks they will be performing. Topics discussed in the tailgate meetings must be documented.

12. STOP WORK AUTHORITY

In accordance with the Company's Procedure HS 203 – Stop Work Authority, Geosyntec personnel and subcontractor personnel have the authority and responsibility to issue a Stop Work Order if unsafe actions and/or conditions are identified. The Stop Work Authority (SWA) process involves a stop, notify, correct, and resume approach for resolving observed unsafe work actions or conditions. The person issuing the work stoppage will first notify workers engaged in or affected by the unsafe activity or condition and require that associated work be stopped. After this Stop Work Order is issued, the Geosyntec project manager and the supervisors for affected or concerned contractors will also be notified. The Geosyntec project manager will document the issuance of the Stop Work Order on the form provided in Procedure HS 203. Work will not resume until the issues and concerns of the Stop Work Order have been adequately addressed.

13. AIR MONITORING

APPLIES TO TASK: ☐① ☐② ☐③ ☒④ ☐⑤ ☒⑥ ☐⑦

NOT APPLICABLE: ☐

Air monitoring will be performed to evaluate airborne chemical and/or dust exposure levels within the breathing zone of site workers. Hazardous conditions may include concentrations that may cause acute or chronic illness, potential oxygen deficient environments, or potential explosive environments. Air monitoring may also be performed to evaluate the adequacy of engineering, administrative, and/or PPE controls. Air monitoring may be "real-time" (e.g., the instrument provides immediate results at the project), using multigas meters, photoionization detectors (PIDs), or colorimetric tubes. Personal monitoring may also be performed by collecting samples and forwarding them to a laboratory for analysis and quantification.

The type(s) of air monitoring equipment required, and associated action levels are outlined in Appendix D. Monitoring equipment must be calibrated based on the manufacturer's requirements. Calibration results and air monitoring measurements must be documented. Based on the results noted and site activities or scope of work changes, the frequency of air monitoring may be adjusted on site by the SHSO with the consent of the Project Manager and communication with the HSC.

14. PERSONAL PROTECTIVE EQUIPMENT

The levels of PPE required for each task are presented in Appendix E. Required equipment and types of protective clothing materials, as well as an indication of the initial level of protection to be utilized, are listed. The level of protection may be upgraded or downgraded by the SHSO according to controls requirements in Appendix E or according to action levels provided in Appendix D.

If respirators are worn, workers must do so in accordance with company's Respiratory Protection Program (HS 112).

15. DECONTAMINATION

The SHSO and Project Manager will determine the type and level of decontamination procedures for both personnel and equipment based on evaluation of specific work

activities in the controlled work zones. Medical treatment will take precedence over decontamination in the event of a life threatening and/or serious injury/illness. Personnel will perform decontamination in designated and identified areas upon leaving "hot zones," where the potential exists for exposure to hazardous chemical, biological, or environmental conditions.

Decontamination of personnel in Level D (modified) will consist of proper containerization and disposal of coveralls, disposable boots, and gloves (if applicable).

Decontamination of personnel in Level C, if applicable, will consist, at a minimum, of:

- Removal and cleaning/disposal of boot covers, coveralls, and outer gloves;
- Removal, cleaning, and storage of respiratory protection;
- Washing of nondisposable PPE suspected of being contaminated using a soap solution followed by a water rinse; and
- Removal and disposal of inner gloves.

Hand tools and sampling equipment shall be decontaminated, as needed, by washing in decontamination basins with appropriate solutions, or, if possible, by dry decontamination. Wash solutions and PPE may require disposal at a licensed waste facility.

16. SPILL CONTAINMENT

The task(s) for this project may involve the handling of drums and/or containers that contain stored chemicals, hazardous materials, and/or wastes. The drums and/or containers may have been spilled/dislodged during site activities due to compromised construction of the drum/container, transportation accidents, improper packaging practices, and improper handling of hazardous materials during on/off loading. Containers shall be inspected, and their integrity assured prior to being moved and/or handled. If the integrity of the container is in question, the container shall be overpacked, or its contents transferred. Operations shall be organized and coordinated to minimize movement of such containers. Where spills, leaks, or ruptures may potentially occur, a supply of sorbents shall be located in the immediate area. Additional preventative measures include:

- UN-approved 55-gallon drums, bins, and/or Baker tanks will be inspected for visible defects upon delivery to the site;
- UN-approved 55-gallon drums will also be inspected to ensure each drum includes a resealable lid with a small resealable sampling port near the top, or on the side of the drum and that the enclosure is not deformed and/or distorted;
- Drums will not be completely filled to allow for possible expansion of liquid and will be set on wooden pallets to facilitate transport by forklift;
- The storage area will be inspected to check for leaks weekly while the containers are being filled and immediately after a relocation to a temporary on-site storage area; and
- Flat areas will be selected for temporary storage away from high-traffic work areas/zones and storm/sewer drains.

In the event of an unplanned release or spill of unknown or hazardous substances, the site supervisor will designate personnel who will support the spill containment, control, and/or cleanup procedures. The team will request additional off-site emergency response assistance, if necessary, based on the type of spill, volume, potential toxicity, etc.

The spill area will be isolated and restricted to only authorized personnel designated to assist with the containment, control, or cleanup activity. Authorized personnel will be trained to contain and clean spills from typical materials and quantities used at the project location. Physical barriers will be set up to warn unauthorized personnel to stay clear and evacuate the affected area. The spill, leak, or incident will be assessed by the team and characterized to determine the appropriate course(s) of action(s) to consider:

- Small spills (maximum volume of 55 gallons of a liquid or 100 pounds of a solid) may be remediated using absorbent materials by designated personnel;
- Large spills (liquid volumes greater than 55 gallons or solid weights greater than 100 pounds) and/or spills of highly toxic materials may require assistance by off-site hazardous materials (HAZMAT) teams;
- Attempts shall be made to identify and stop the source(s) of spillage immediately while donning proper PPE (based on action levels and the air monitoring program) and performing air monitoring;

- The site supervisor will direct spill-response operations and stay at the spill area until it has been cleaned, inspected, and cleared for reentry; and
- The site supervisor will prepare a spill incident and cleanup report and will communicate findings to the Project and Branch Manager and H&S Department.

17. CONFINED SPACE ENTRY

☐ APPLICABLE ☒ NOT APPLICABLE

The task(s) for this project involve confined-space entry. Workers must abide by the company's Confined Space Entry Program (Procedure HS 118).

18. GLOBALLY HARMONIZED SYSTEM (GHS) FOR HAZARD COMMUNICATION

☒ APPLICABLE ☐ NOT APPLICABLE

The following procedures must be followed for chemicals brought onto the site by Geosyntec personnel or by subcontractors (decontamination solution, sampling preservatives, KB-1® solution, sodium permanganate, etc.) while performing the tasks of this project:

- Labels on primary chemical containers must not be defaced;
- Chemicals must be stored in appropriate storage containers;
- Secondary containers and storage cabinets must be correctly and clearly labeled;
- Chemicals incompatible with each other must not be stored together;
- Workers must receive training on the chemical hazards; and
- Safety Data Sheets (SDSs) must be added to Appendix F.

When chemicals are used on-site, workers must abide by Geosyntec's GHS Hazard Communication Program (Procedure HS 115).

19. HASP AMENDMENTS

Over the course of this project, it is possible that the project-specific hazards and working conditions will change. This HASP may be reviewed and amended, as necessary, to

effectively describe the changing working conditions and measures to mitigate the potential health and safety issues that may arise during the project. Amendments to the HASP should be briefly described in the following spaces provided. The full text of the amendments should be provided in Appendix A and/or additional THAs should be added to Appendix B.

AMENDMENT 1:

Date: _____ Project Manager: _____ HSC: _____

Brief Description of Amendment:

_____

_____

_____

_____

_____

AMENDMENT 2:

Date: _____ Project Manager: _____ HSC: _____

Brief Description of Amendment:

_____

_____

_____

_____

_____

AMENDMENT 3:

Geosyntec
consultants

Date: _____ Project Manager: _____ HSC: _____

Brief Description of Amendment:

_____

_____

_____

_____

_____

Attachment A: HASP Amendments

Discuss details of amendments to this HASP here. Include amendment number, date, and details of amendments.

Attachment B: Task Hazard Analyses

TASKS
Test Pits
Soil Sampling
Groundwater Monitoring
Working Over or Near Water

THAs for these tasks are presented in the following pages.

Geosyntec consultants

Geosyntec HSE Procedures referenced herein are available on Geosyntec's HSE SharePoint site and should be consulted, as appropriate, to ensure requirements are met. This THA has been prepared per "*HSE STD-105, Project Safety Management Handbook*"

TASK HAZARD ANALYSIS

(Ver. 4.0, 9-8-2023)

Part A – PROJECT/TASK INFORMATION

Project/Site Name:	Camas Mill – Remedial Investigation	**Project Number/Org:**	AS130290L/02B
Site Address:	401 NE Adams Street, Camas, WA 98607		
Task & Worksite Description:	Geosyntec will conduct surface and subsurface investigation activities at an active paper production facility.		
Geosyntec Personnel:	**Name**	**Office Phone**	**Cell Phone**
Site Safety Lead/Officer Task Technical Lead	Erin Dunbar	(971) 271-5916	(971) 469-3080
Project Manager	Cindy Bartlett	(971) 271-5895	(503) 505-4145
Project Director	Tim Flynn	(206) 780-7730	(206) 276-5540
Local HSE Coordinator	Madeline Solimano	(206) 499-6773	(206) 499-6773
Regional HSE Manager	Madison McLaughlin	+1 (858) 716-2900	(951) 990-2888
Corporate HSE Director	Bob Poll	(813) 379-4420	(813) 240-9231
On-Site Subcontractor(s): ☐ Not Applicable	☐ Applicable; provide company name, work task and contact information for each Geosyntec subcontractor below:		
Client, Contact(s):	Matt Tiller, director of remediation services	(404) 652-5243	(404) 216-6674
ETHICS POINT HOTLINE	US & Canada: 844-231-3371 UK: 800-89-0011 or 800-89-0011	Australia: 800-551-155 or 800.811.011 Ireland: 800-222-55288 or 800-500-000	

Part B - EMERGENCY RESPONSE and FIRST AID

IMPORTANT: After initial emergency response actions and incident stabilization, contact appropriate project staff and/or HSE personnel listed in Part A

Site-Specific Notes, Clarifications: On-site areas where facility operations have ceased ("static" areas) are generally considered accessible for purposes of field activities. Areas where facility operations continue and therefore conditions may continue to change due to ongoing operations ("dynamic" areas) are generally considered inaccessible for purposes of field activities. Developments in accessibility (e.g., condition change from dynamic to static) and sampling results will be discussed with Ecology, and field activities will be evaluated accordingly.

Emergency Communication / Alerting	☒ Verbal ☒ Cell Phone ☐ Land Line ☐ 2-Way Radio ☐ Satellite Phone ☒ On-site alarm/signal system ☐ Other:
To Summon Police, Fire, Ambulance	☒ **DIAL 911**, for external responders ☐ **Other**:
WorkCare *(for non-emergency injuries)*	**24/7: 888-449-7787**
Other Emergency Contacts *(such as security, spill responder, utility-related):*	N/A
Nearest EMERGENCY ROOM Medical Services	Hospital Name: Peace Health Southwest Medical Center Address: 400 NE Mother Joseph Place, Vancouver, WA 98664 Phone #: (360) 729-8370 ☒ **See ATTACHMENT A, ROUTE to HOSPITAL**
Emergency Evacuation - Route, Rally/Muster Point, Shelter Location(s)	Muster point shall be determined each day during the safety tailgate meetings given dynamic site conditions.

EMERGENCY and FIRST AID EQUIPMENT required for this work task is listed in **PART C.2. – SAFETY EQUIPMENT LIST**

Attachment Hospital A: Route to Hospital

PART C – HAZARD ANALYSIS and EQUIPMENT LIST *(Basis for Field Team Safety Orientations and Onsite Safety Discussions)*

C.1 ONSITE TASK HAZARD ANALYSIS

INSTRUCTIONS:

- Begin your job safety analysis by reviewing **"Pointers"** (see lower right) and completing ***Part D "HAZARD ANALYSIS AND CONTROLS*** for your TASK(s).
- In **Columns 1 & 2** (below), list/describe **TASKS & WORK ASPECTS** and the associated **HAZARDS & RISKS.**
- In **Column 3** summarize **CONTROLS & SAFE WORK PRACTICES** (Brief summary descriptions with references to THA Sections).

ALWAYS "COLLAPSE" THESE INSTRUCTIONS IN COMPLETED THA!

REFERENCES - Copy and paste, as applicable, into **Column 3:**

See C.2. SAFETY EQUIPMENT LIST
See D.1. BASELINE HAZARD PREPAREDNESS
See D.2. SPECIAL TRAFFIC/VEHICLE/TRANSPORT HAZARDS
See D.3. WATER HAZARDS
See D.4. FALL HAZARDS
See D.5. HAND TOOLS
See D.6. POWERED TOOLS & EQUIPMENT
See D.7. DRILLING
See D.8. CONSTRUCTION, HEAVY/LIFT EQUIPMENT
See D.9. STORAGE OF BULK MATERIALS
See D.10. ELECTRICAL WORK TASKS
See D.11. UTILITY-RELATED HAZARDS
See D.12. CONFINED/ENCLOSED SPACES
See D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS
See D.14. COMMERCIAL CHEMICAL PRODUCTS
See D.15. SITE CONTAMINANTS, CHEMICAL WASTES
See D.16. RADIATION HAZARDS (Other than Sunlight)
See D.17. HAZMAT/DANGEROUS GOODS SHIPPING.
See Part E AIR MONITORING, EXPOSURE MONITORING
See ATTACHMENT "X"

For POINTERS on completing a HAZARD ANALYSIS, see <HERE>

1. TASKS/WORK ASPECTS	2. HAZARDS/RISKS	3. CONTROLS / SAFE WORK PRACTICES
Mobilization/Demobilization	Routine work travel	See D.1. ROUTINE HAZARD PREPAREDNESS See D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS • Avoid cell phone use while driving • Obey all posted traffic signs and local laws • Demonstrate defensive driving • Plan route before beginning travel • Allow pedestrians the right-of-way • Familiarize with new area/site conditions
Premises Hazards	Driving hazards Active and changing site conditions	Take breaks to avoid heat illnesses and stay hydrated. See D.1. BASELINE HAZARD PREPAREDNESS
b. Premises Hazards	For example: - Driving hazards - Underground utilities	In addition to basic driving safety, limit speed to 5 mph (8 km/hr) while onsite; when exiting the site onto roadway, right turn only (no left turns across traffic). For all work, wear hard-toe work boots, proper work clothes, reflective/hi-vis vest, eye protection. Hearing protection near noise sources. Install vapor pins at appropriate clearance of underground utilities and hazards.
c. Task/Subtask Hazards		

sub slab vapor pin install	For example: - Power tool use - Dust reduction - Noise protection -	Keep cords away from drilling area and use the roto hammer properly and safely. Use shop vac while drilling to reduce airborne dust and mask during drilling. Wear ear plugs to reduce exposure to loud noise during drilling. Wear safety glasses during drilling to protect eyes from dust and debris
sub slab vapor sampling	For example: - Wear proper PPE - Lifting and squatting -	Wear safety glasses and gloves to protect from pump and equipment pieces. Be careful while squatting down to work area and while lifting equipment.

4. ONSITE CHANGES, UNFORSEEN HAZARDS, THA "ADJUSTMENTS" (Recognized During Mobilization/Execution of Field Work)

Date:	Notes:
Date:	Notes:

C.2. SAFETY EQUIPMENT LIST (Gear to be brought to the worksite by Geosyntec personnel, or availability at the worksite confirmed)

Site-Specific Notes, Clarifications: Project is occurring during business hours at an active dry cleaner (clothes drop off only, no cleaning) and pizza restaurant. Will need to be mindful and/or block off work area from customers or employees during drilling or hammering.

☒	**WEATHER, CLIMATE, SEASONAL**	☐ Project-provided drinking water ☐ Canopy for shade, weather protection	☒ Sunscreen ☐ Ice creepers (boot attachments)	☐ Rock salt, traction sand ☐ Portable heater (electric or kerosene)
		☐ Other:		
☐	**HYGIENE PROVISIONS**	☐ Hand washing equipment (soap & wash water)	☐ Hand sanitizer, disinfectant supplies	☐ Sanitary facility, porta-toilet
		☐ Other:		
☒	**BASIC PPE**	☒ Standard work clothes appropriate for task ☒ Hard-toed boots/shoes ☒ Hardhat (as needed)	☒ Safety glasses ☒ Work gloves appropriate for task ☒ Noise/hearing protection (as needed)	☒ High-visibility/reflective vest/apparel ☒ Nuisance dust mask (voluntary use)
☐	**BIOLOGICAL HAZARDS**	☐ Insect/tick repellant--DEET, picaridin, other ☐ Permethrin-treated work clothing ☐ Pant-leg "blousing"/gaiters (tick safe) ☐ Tick removal kit ☐ Wasp/hornet spray, insect fogging device, other ☐ Poison ivy protection (Ivy Block skin cream, Tecnu skin wash)	☐ Animal warning device (for bears/cougars/wolves/large animals) ☐ Snake chaps/gaiters, bite/scratch-resistant gloves, other protective gear for animal hazards ☐ Hand sanitizer, hand washing supplies, personal hygiene supplies for infectious hazard control ☐ Disinfectant solution and related supplies to mitigate source of infectious hazard ☐ Masks, face covers, gloves, barriers, related gear to mitigate infectious hazard transmission	
		☐ Other:		
☐	**SPECIAL HAZARD CONTROLS**	☐ Portable GFCI(s) for shock protection ☐ Electrical-hazard-rated boots, gloves ☐ Arc-resistant (AR) protection PPE for arc flash ☐ Flame-resistant (FR) clothing ☐ Work-area delineation supplies	☐ Lockout/tagout equipment ☐ Portable lighting ☐ Tripod/winch ☐ Ventilation equipment (fan, blower) ☐ Traffic control devices	☐ Personal fall protection apparatus ☐ Personal flotation device ☐ Ring buoy & rope ☐ Marine survival suit
		☐ Other:		
☐	**CHEMICAL PPE and CHEMICAL SAFETY GEAR**	☐ Goggles and/or face shield ☐ Chemical protective gloves ☐ Coveralls (Tyvek, or other) ☐ Outer boots, boot covers	☐ Disposable N95 respirator ☐ Half-face respirator (APR), cartridges ☐ Full-face respirator (APR), cartridges ☐ Exclusion Zone delineation supplies	☐ Decon solution, related supplies ☐ Receptacle for disposable PPE ☐ **Chemical hazard emergency gear – listed in "EMERGENCY EQUIPMENT" below**
		☐ Air monitoring equipment, worker exposure monitoring device(s):		
		☐ Other:		
☒	**EMERGENCY EQUIPMENT**	☐ **Air horn, alarm, alerting equipment** ☐ **2-Way radios; other communication device** ☒ **First aid kit(s) – onsite and/or in vehicles** ☒ **Fire extinguisher – onsite and/or in vehicles**	☐ **Eyewash bottle(s)** ☐ **15-min. eyewash station** ☐ **Emergency deluge shower** ☐ **Chemical spill kit/supplies**	**Vehicle emergency preparedness:** ☒ **Fire extinguisher, first aid kit** ☐ **Flares, lights, reflective device** ☐ **Roadside assistance service**
		Other:		

PART D – HAZARD ANALYSIS AND CONTROLS *(Site-Specific Safety Analysis & Information)*

D.1. "BASELINE" HAZARD PREPAREDNESS (This section applicable to ALL Tasks, covering natural hazards, driving/travel, basic safety & PPE)

a. Weather/Climate/Altitude Hazards

☒ **Heat stress** – Prevent heat-related illness; At ambient temps > 80ºF (27ºC) **use Geo HeatTracker to assess hazard**, implement mitigations accordingly.

☒ **Cold stress** – Prevent frostbite, hypothermia; multiple clothing layers, keep clothing dry, protect exposed skin, stay hydrated, frequent warming breaks.

☐ **Sunburn, conjunctivitis** – Sun blocker, shade canopy, wide-brimmed hat, long sleeves/pants; protect eyes from glare near water/snow/sand

☐ **Extreme weather** – Track weather, emergency plan: ID shelter/refuge, use weather app for lightning prediction at 10 mi./16 Km (use "30/30 rule" as backup).

☐ **Weather-related conditions** – Use appropriate precautions for ice/snow/slippery conditions, flood, mold, soft ground, downed trees/wires, fire hazards, other.

☐ **Acute Mountain Sickness (AMS)/Altitude Illness** – for work to be performed at ≥ 8,000 feet (2,450 meters) above sea level, see *THA Addendum on AMS.*

Site-Specific Notes:

HSE Program Documents, *HSE SOP-409: Heat Illness Prevention*, *HSE SOP-410: Cold Stress Prevention*

b. Biological Hazards

☒ **Insect/tick/arthropod hazards/vector-borne disease** – Use insect repellant, permethrin-treated clothing/gear, tick checks, tuck pants/shirt, tick removal tool, wasp spray, bug zapper/trap, mosquito netting, fogging, other barriers and protective devices, habitat treatment/removal, as applicable.

☒ **Plant hazards** – Know the hazards (e.g. poison ivy/oak/sumac, giant hogweed, poison hemlock, nettles, etc.), know the precautions for site habitat: barrier ointments, washes; long sleeves/pants, gloves, remove plants (avoid burning), launder work clothes (hot water/detergent), clean tools (alcohol or soap/water).

☐ **Animal hazards** – Know the hazards/precautions for work site: avoidance, repellants, PPE, warning devices, habitat/food source removal, infection controls.

☐ **Common unsanitary/allergenic hazards** – Use routine hygienic measures/precautions; hand washing/sanitizer, food hygiene, PPE, disinfectant cleaning.

☐ **Infectious/pathogenic** - For site-specific infectious hazards (viral, bacterial, bloodborne pathogens, mold, other), see **D.13 "Infectious/Pathogenic Biohazards."**

Site-Specific Notes:

HSE Program Documents: *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants*,

c. Routine Driving Hazards

☒ **Routine work travel** – Use routine safe/defensive driving practices (seat belts, safe speeds, eyes ahead, no tailgating, limit distractions, safe cell phone use, no texting, clear windows, account for weather/road conditions, adequate sleep, other measures as appropriate).

☒ **Unfamiliar location** – Before driving in roadway: view map, note key benchmark locations, plot your route and/or enter destination into navigation device.

☒ **Unfamiliar vehicle** – Before driving in roadway: become familiar with vehicle controls; adjust seat, mirrors, vents, heat/AC, audio, lights, check brakes.

☐ **Fatigue** – Minimize fatigue during long drives: frequent rest breaks, muscle stretches, eat light snacks-avoid heavy meals, stay hydrated, fresh air, no loud music, clean windshield; avoid/minimize long distance driving during your ordinary sleep hours; total *work time* and *drive time* should not exceed 14 hours per day.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-220: Fatigue Management*, *HSE SOP-605a: Driver Authorization Program*

d. General Safety

☒ **General premises hazards** – Prevent slips/trips/falls (resulting from rough terrain, trip hazards, steep slope, slippery surfaces); maintain good housekeeping, be aware of on-site structures, utilities, overhead hazards, uneven/hazardous surfaces, obstacles, onsite traffic, restricted access/workspace.

☒ **Musculoskeletal hazards** – Prevent strains/sprains from strenuous tasks, overexertion, repetitive motion/ergonomic/lifting (seek help/lift-aids over 49 lbs.)

☒ **Worksite traffic hazards** – Implement measures to protect personnel (high-visibility/reflective clothing, on-person lighting, traffic control measures).

☐ **Hazardous energy** – Use caution near electrical equipment/wet locations, machinery/physical hazards, stay out of hazard zone/line-of-fire, don't touch.

☐ **Illumination hazards** – Illuminate work areas and/or access routes, use high-visibility and reflective clothing or on-person lighting, as appropriate.

☐ **Security: high potential for crime/workplace violence/security breach** – Complete a *Risk Assessment for Working in High-Crime, High Security Risk Locations*

☐ **Working alone –** Communicate a project-specific lone-work plan to coworkers, including procedures for periodic communication/contact.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*, *HSE SOP-210: General Housekeeping*, *HSE SOP-401: Lone Working*, *HSE SOP-403: Management of Traffic*, *HSE SOP-616: General Safety Rules*

e. Basic Personal Protection

☒ **Head protection from overhead hazards** – Wear hardhat or "bump cap" as appropriate for hazard.
☒ **Hand protection** – Wear gloves to protect from physical, chemical and biological hazards; select glove type (or types) specific for the task & hazard(s)
☒ **Eye protection** – Wear safety glasses (with side shield or wrap around, either clear or shaded for sun protection), or other appropriate eye protection.
☒ **Foot protection, rough terrain** – Wear work boots/shoes with hard toes, ankle support, puncture resistance, traction, as appropriate for conditions.
☒ **Hearing protection** – use earplugs or earmuffs (or both) as appropriate for conditions; at a minimum where noise levels exceed 85 dBA.
☒ **Protective clothing/nuisance dust mask** – For general protection against dust, dirt, oily residues, unsanitary conditions, as needed.
☐ **Other personal protective gear** for task(s) covered in this THA is described in respective sections of this THA in Site-Specific Notes & Clarifications

Site-Specific Notes:

HSE Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-135: Hearing Protection Program*

D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

(For water-transportation hazards, see D.3. "Water Hazards"; For construction traffic hazards, see D.8. "Construction, Heavy Equipment, Lift Equipment")

Site-Specific Notes & Clarifications:

☒	**THOROUGHFARE TRAFFIC HAZARDS** Where the worksite is located in/near vehicle thoroughfare (road, highway, parking lot, etc.). Hazards: Injury to worker and general public from collision involving moving vehicle.	☐ Prepare Management of Traffic (MOT) Plan (address location hazards / client and regulatory requirements). ☒ Wear DOT-approved reflective vests where exposed to traffic hazards. ☒ Where possible, park vehicles as protective shield from oncoming traffic. ☒ Configure work area and support vehicles to minimize worker exposure to traffic hazards. ☐ Use DOT signal devices and/or signage to re-route vehicles around work area, site entrances/exits. ☐ Use DOT-trained flaggers or police detail where appropriate or required. ***HSE Program Documents:*** *HSE SOP-403: Management of Traffic*
☐	**SPECIAL VEHICLE HAZARDS** Off-Road Driving or use of non-typical vehicle, heavy vehicle, work truck, van, UTV/ATV Hazards: Worker injury due to vehicle collision, rollover	☐ For off-road driving, do not exceed capability of vehicle, beware of wet conditions, keep speed low, avoid unsafe orientation on slopes. ☐ UTV/ATV-specific procedures for training, use roll-bar or helmet, operate per manufacturer's instructions. ☐ Special Skills Required for Vehicle type – For vehicles requiring special skills (such as windowless van, heavy work vehicle, utility vehicle, similar) ensure operator is provided training and/or has appropriate operator skills through experience. ***HSE Program Documents:*** *HSE SOP-652a-Utility Vehicles (US-only) (safe operation of mobile equipment)*
☐	**TOWING/HAULING LOADS** Hazards: Vehicle accident, occupant injury from shifting load, unsafe equipment, un-roadworthiness of trailer and/or vehicle.	☐ Ensure load within vehicle is firmly secured (rope, straps, load configuration) to prevent shifting during travel. ☐ Slings, chains, strap, rope and related equipment used for towing, hauling, load-securing shall be appropriate for use, and used in a manner as to prevent an unsafe condition (generally, bungee cords not appropriate). ☐ For trailer use, verify tow-hitch components are compatible, hitch/safety chains secure, signal/braking lights operational, rear-view mirrors effective, tires inflated to proper pressure and tread acceptable.
☐	**RAILROAD RIGHT-OF-WAY HAZARD** Hazards: Struck by train in R.R. right-of-way; electrical shock from third rail or overhead electrical lines	☐ Coordinate with rail company or on-site host facility and implement required safety and security measures. ☐ Site workers shall receive safety training/certification (per railroad owner/operator) for railroad work.
☐	**AIRPORT HAZARDS** (on the ground) Hazard: Injury due to proximity on/near airport runway, flight path.	☐ Coordinate safety requirements with airport personnel and implement required safety measures. ☐ Site workers shall receive safety training/certification (per airport owner/operator) for airport work. ***HSE Program Documents:*** *HSE SOP 628: General Aviation (Small Aircraft) Safety*
☐	**LIGHT AIRCRAFT/HELICOPTER USE** Hazards: Injury from collision during taxi/take-off/landing, aircraft crash and related general aviation hazards	☐ Review certifications/licenses/experience of pilot, airworthiness certificate for aircraft, safety practices of operator, aircraft safety rating, safety equipment/provisions on aircraft. ☐ Passengers shall adhere to general passenger safety practices, and requirements of owner/operator/pilot. ☐ For transport of HazMat/Dangerous Goods, see **D.17., "Transport/Shipping of Hazmat/Dangerous Goods"** ***HSE Program Documents:*** *HSE SOP-628-General Aviation, Small Aircraft Safety*
☐	**USE OF AERIAL "DRONE"** Hazards: Airspace interference, collision with ground personnel, general public, infrastructure.	☐ For use of aerial drone--a.k.a. *small unmanned aerial system* (sUAS), *remote piloted aircraft* (RPA) or *unmanned aerial vehicle* (UAV)--review/adhere to requirements for regulatory certifications, authorizations & approvals, and pre-mob planning for pre-flight-, in-flight-, and post-flight checks, and unplanned events. **HSE Program Documents:** HSE MAN-003a: Unmanned Aerial Systems Manual (U.S. Only)

D.3. WATER HAZARDS (Working Over/On/Near Water, Ash Ponds, Quicksand, Soft Ground) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐ **WATER HAZARDS**

Work/travel in watercraft or on equipment over water or over coal ash impoundment/pond:
☐ Workboat, barge, over-water structures
☐ Water transportation
☐ Hazardous currents (river, tidal/riptide)
☐ Towing, trailer, roadway
☐ Other – describe above

Walking/wading into water, on shoreline, riverbank, dock, bulkhead, abutment, coal ash:
☐ Wading/walking into/near water, wetland
☐ Hazardous tidal zone or surf
☐ Water release, flash flood
☐ Coal ash pond, quicksand, soft ground
☐ Open culvert, arroyo, drainage/irrigation ditch
☐ Ice hazard on or near waterbody

Diving
☐ Scientific SCUBA diving

Hazards (as applicable):
- Drowning, cold immersion
- Boating collision, navigation, fog, darkness
- Fire/fuel hazards
- Entrapment (mud/silt/coal ash/quicksand)
- Slip/fall hazards – ice, mud, silt, wet surfaces
- Weather, heat/cold stress
- Equipment failure, hypoxia
- Chemical contaminant and/or biological hazard

General water-safety measures for all work near water:
☐ Wear regulatory-approved personal flotation device (PFD) where drowning hazard is present.
☐ Bring emergency rescue and/or signaling equipment (ring buoy and rope, reaching device, flares)
☐ For fall protection over water, see **D.4. "Fall Hazards."**
☐ For electrical hazards associated with water/wet locations, see **D.10. "Electrical Work Tasks."**

Boating-specific:
☐ Use fuel safety practices, fire extinguisher present in boat.
☐ Develop/follow float plan, monitor weather, navigate/communicate as planned.
☐ Confirm navigation/communication equipment operable before heading onto water.
☐ For work over very cold water, have immersion survival suit available.
☐ For tidal, flash flood, dam release hazards, plan/locate work accordingly.
☐ For towing a boat trailer, see **D.2. "Special Driving/Traffic/Transportation Hazards."**

Wading in water or walking along shore/bank or on dock/pier/abutment:
☐ For ice/slip hazards, wear ice creepers, sand work area, use tether, other appropriate measures.
☐ For work on ice over water, verify safe thickness, have ring buoy & rope available
☐ For unsure/slippery footing in water, use wading staff, high-traction soles on waders.
☐ Have lifesaving skiff/boat available in circumstances where other rescue means are inadequate.
☐ Monitor hazardous tides, weather for flash floods, know water release schedule.

For soft ground, ash ponds, quicksand:
☐ Wear personal flotation device (PFD), as appropriate for the work task and work environment.
☐ Bring emergency rescue equipment (ring buoy and rope, reaching device)
☐ If walking on ash/quicksand, provide stable walking/working surface (4'x8' plywood, or similar)

For diving:
☐ Develop a diving safety plan approved by Geosyntec's diving coordinator

For chemical contaminant and/or biological/infectious hazard:
☐ See **Section(s) D.1.b., "Biological Hazards**, **D.13., "Infectious/Allergenic Biohazards," D.14., "Commercial Chemical Products," and/or D.15., "Site Contaminants, Chemical Wastes"**

HSE Program Documents: *HSE SOP-407: Working On/Near Water and Ice, HSE SOP-630: Water Transportation Safety, HSE MAN-005: Underwater Diving Operations Manual*

D.4. FALL HAZARDS (Falls to Lower Levels) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐ **WORKING AT HEIGHTS (GENERAL)**

Hazards:
- Injury from falls onto lower surface or falls into hazardous equipment, chemicals, water
- Overhead utilities/obstructions
- Impalement hazard (such as from falling onto unprotected rebar and similar surface projections)
- Hazard posed to ground personnel from falling tools, equipment, materials

Fall protection "trigger heights":
Built environment *– US & CAN: 4 ft. (1.2 m.);* ***Construction:*** *US: 6 ft., 10 ft. for scaffolds; CAN: 10 ft. (3 m)*

Protect from ***primary*** (fall) hazards:
☐ Restrict access to hazard (barriers, tape, sign)
☐ Ensure safe access to height (ladder, stair, lift)
☐ Ensure guardrails/stair-rails/handrails present
☐ Ensure covers in place over holes
☐ Use designated "watch person/monitor"
☐ Use tether or positioning device
☐ Use personal fall apparatus (PFA)
☐ Use fall protection net

Protect from ***secondary*** (collateral) hazards:
☐ Protect site ground personnel from falling objects (restrict access, toe-boards, tether tools)
☐ Install caps on protruding rebar and similar
☐ Working over water; see **D.3, "Water Hazards"**
☐ Working over hazardous machinery/equipment; see **D.6, "Power-Tools/Powered Equipment"**
☐ Overhead electrical; See **D.11. "Utility-Related Hazards"**
☐ Working over chemical hazards; See **D.14 and/or D.15 for chemical and/or contaminant hazards.**

HSE Program Documents: *HSE SOP-405: Walking-Working Surfaces Protection, HSE SOP-415a: Fall Protection (North America-only), HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

☐ **LADDER / STAIRS**
☐ Extension/straight ladders
☐ Step ladders
☐ Fixed/installed ladders
☐ Portable/mobile stairs
☐ Job-made or scaffold stairs

Hazards:
- See general fall hazards, above.

☐ Follow safe work practices:
- Use ladders according to safe practices and manufacturer's instructions.
- Maintain 3 points of contact at all times on ladder; keep center of gravity within side rails.
- Do not use metal (conductive) ladder near electrical hazard.
- Extension/straight ladders shall be properly footed, secured, angled, extend above upper work surface.
- Stepladders are set on level ground or properly shimmed, spreaders locked; do not climb/stand on top step, top cap, or rear non-climbing side; use step ladder of sufficient reach height for work.
- Equip stairs with stair handrails where more than 4 steps, and for stairway height of 4' or more.
- Ensure portable stairs are stable, plumb, and of sufficient reach height for task.

HSE Program Documents: *HSE SOP-415a: Fall Protection (North America-only); HSE SOP-638: Ladders and Stairways*

☐	**SCAFFOLD** ☐ Supported scaffold ☐ Suspended scaffold ☐ Free-standing/mobile scaffold Hazards: - See general fall hazards, above - Equipment collapse	☐ Follow safe work practices: • Identify/coordinate operations with the scaffold "Competent Person." • Supported scaffold level, stable, proper attachments, tiebacks, planking, • Suspended scaffolds anchored properly. • Guardrails or personal fall apparatus required above 10 feet. • Proper means of accessing scaffold (proper ladders, stair tower); don't climb scaffold frames. • Total height of free-standing scaffold shall not exceed four times the minimum base dimension. • Don't exceed load limits, distribute loads evenly, stage materials in quantities sufficient for immediate use. ***HSE Program Documents:*** HSE SOP-648: Scaffolds
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - See general fall hazards, above - Struck-by, run-over, tip over - Caught between (pinch points) - Fluid leaks/fuel hazards or battery-related hazards	☐ Follow safe work practices: • Operators shall be trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn whenever operating a boom lift (optional for scissors lift). • Overhead hazards and surface obstructions shall be reviewed with operators prior to use. ***HSE Program Documents:*** *HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)*
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11., "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.5. HAND TOOLS (Manual, Hand-Powered) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Hammers will be used to install the sub slab vapor sampling equipment.

☐	**MANUAL HAND TOOL INJURIES** ☐ Struck by ☒ Pinch points/crushing injuries ☐ Puncture ☐ Cutting blade/laceration risk ☒ Flying objects, eye hazards ☐ Other, describe above	☒ Proper tool for the job, maintain in good condition, use vise/clamp to hold work piece, proper follow through, Self and nearby personnel shall stay clear of "line of fire," use appropriate work gloves, keep blades sharp, use wrist strap when dropped tool poses a hazard. ☒ Utility/folding/collapsible knives and fixed-blade knives/cutting tools are *not* permitted, unless specifically authorized. Cutting tools with auto-retracting blades, or with enclosed/guarded blades are permitted. Use cut-resistant heavy work gloves, as applicable. ☒ Ground surface penetration (hand auger, probe) – requires utility clearance; see **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-640: Manual Hand Tools*
☐	MUSCULOSKELETAL (MSK) HAZARDS ☐ Risk of acute physical MSK trauma (strains, sprains, soft tissue injuries) ☐ Risk of cumulative/chronic MSK trauma, repetitive motion injuries	☐ For tools requiring high exertion (shovel, hand auger, sledgehammer, pickaxe, slide hammer, similar): do stretching exercises to prepare, clear hazard zone, use stable body position, take rest breaks, avoid overexertion. ☐ For recognized musculoskeletal hazard, acute or chronic, resulting from unsafe acute exertion, or ergonomic/repetitive motion/cumulative trauma risks, seek advice on controls **from Corporate HSE Dept**. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.6. POWERED TOOLS & EQUIPMENT (For Drilling & Heavy Equipment, see D.7 & D.8) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**Type of powered tools/equipment:** ☒ "Power tools" ☐ Powered portable equipment ☐ Powered fixed equipment **Energy/power source:** ☐ DC battery- or solar-powered ☐ AC electric-powered ☐ 120V ☐ 240V ☐ 480V ☐ Extension/flexible cords ☐ Fuel-powered (gas or liquid) ☐ Pneumatic ☐ Hydraulic ☐ Gunpowder-actuated **Hazards of Power Tools and Powered Equipment:** ☒ Eye/hand/body injury ☒ Point-of-operation hazards ☒ Pinch points, moving parts	☒ General safe work practices for operation of powered tools and equipment: • Inspect before each use to ensure safe operating condition. • Clear personnel from hazard zone; keep personnel out of the "line-of-fire;" heed warning labels/signage. • Arrange worksite for safe access to equipment and sufficient work area clearance for safe use of tool; confirm no overhead obstructions; ensure adequate illumination. • Secure long hair/loose clothing/hanging jewelry near moving/rotating parts. • Ensure point-of-operation, mechanical power transmission, other moving parts are guarded with protective devices (as applicable); do not override interlocks, guards, protective devices. • Do not make any equipment modifications that create a greater hazard or bypass safety design features. • Use tool/equipment in accordance with manufacturer's use and safety instructions. • Use PPE and/or other safety protections, as appropriate, for eye/hearing/hand/head/body protection. • Provide training or verify operator competency for use of power tool/equipment. • Use ventilation, wet methods, respirators, other applicable means to mitigate inhalation hazard. • Move power cords/pressurized hoses to protect from damage during tool/equipment use. • For spark/heat generating tool/equipment, have fire extinguisher available, remove combustible/flammable materials, or use other means to control fire hazard (e.g. fire watch, fireproof blanket). • Use safe lifting practices and/or lift aids for moving heavy portable equipment, and use safe operating procedures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. • Implement safe work practices for compressed air, pressurized systems (pneumatic/hydraulic), stored energy. ☒ Additional requirements for power tools: • Use vise/clamp/work bench or other means to hold/secure a portable/moveable work piece. • Don't carry electrical tools/equipment by the power cord; don't carry pneumatic tools by hoses. • Disconnect tool/equipment from power source before changing bits, blades or making adjustments.

	☐ Line-of-fire hazards, struck by ☐ Fire/explosion, ignition sources ☐ Burns from hot surfaces, steam ☒ Noise ☒ Inhalation/atmospheric hazards ☐ Working at heights, falls ☐ Overhead obstruction(s) ☐ Musculoskeletal hazards ☐ Potential (stored) energy ☐ Illumination	☐ Additional requirements for fixed powered equipment: • Implement lockout/tagout controls for repairs/adjustments/tooling changes. • Equip pneumatic hoses with whip checks; ensure factory fittings are used for high-pressure hose connections. ☐ For climbing/fall hazards associated with large equipment, see **D.4. "Fall Hazards."** ☐ For electrical hazards, see **D.10. "Electrical Work Tasks."** ☐ For ground surface penetration, see **D.11. "Utility-Related Hazards."** ☐ For fuel-safety practices, see **D.14. "Commercial Chemical Products."** ☐ For air monitoring of atmospheric hazards, see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**WELDING, CUTTING, HOT WORK** ☐ Arc-welding (electrical arc) ☐ Gas-welding/cutting (fuel gases) Hazards: - UV/IR light-eye/skin burns - hot-work hazards/fire - toxic metal welding fumes - compressed gases (physical hazards, fire, oxygen deficiency) - electrical shock	☐ General safe work practices for operators of welding equipment: • Hot work permit system shall be implemented. • Operator properly protected (eye protection, clothing, apron, etc.). • Fire hazard controls (watcher, fire extinguisher, water, remove combustibles from work area). • Protect nearby personnel from hazardous UV, IR light (shielding, curtain); see **D.16. "Radiation Hazards."** ☐ For welding gas cylinders, secure them upright with caps on when stored or not in use; protect cylinders from damage; NEVER secure gas cylinders to metal welding bench used for electrical arc welding; see **D.14. "Commercial Chemical Products."** ☐ For arc welding, follow electrical safe work practices; see **D.10. "Electrical Work Tasks."** ☐ For inhalation hazards from welding fumes (toxic metals) and gases (asphyxiant, flammable), see **D.14. "Commercial Chemical Products."**
☐	**PORTABLE ELECTRIC GENERATOR** Hazards: - Electrical shock - Carbon monoxide inhalation hazard - Fuel-related fire hazard - Injury from mechanical or lifting hazard - Burns from hot surfaces	☐ Follow general safe work practices for Powered Tools & Equipment (above), and as follows: • Use in accordance with manufacturer's instructions, including instructions for grounding the generator. • Keep generator and work area dry. • Never use indoors, or near building air intake vents due to carbon monoxide hazard. • Provide for ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Use hearing protection in close proximity to operating generator (where noise level exceeds 85 dBA). • Use power cords/extension cords specified by instructions. • Use ground-fault circuit interrupters (GFCIs) in accordance with manufacturer's instructions; see **D.10. "Electrical Work Tasks."** • Shut down equipment before refueling; see safe practices for flammable/combustible liquids in **D.14. "Commercial Chemical Products."**
☐	**PNEUMATIC / HYDRAULIC HAZARDS** ☐ Air compressor ☐ Compressed air system ☐ High-pressure liquid ☐ Pressurized steam (For compressed gas cylinders, see **D.14. "Commercial Chemical Products")**	☐ Never direct outlet nozzle toward body; use guards, restraints, engineering controls as appropriate. ☐ Never use compressed air for cleaning clothes you are wearing. ☐ If compressed air is used for cleaning, restrict pressure to 30 psi or below, equip nozzle with chip guard. ☐ Use PPE for eye (goggles or face shield)/hand/head/hearing/skin protection, as appropriate for the hazard. ☐ Ensure tank, hoses, fittings are in good repair using factory fittings, equipped with whip-checks. ☐ If pressure relief device poses a hazard to workers, reconfigure or shield device or restrict access by workers.
☐	**PORTABLE HEATER** ☐ electric ☐ fuel-powered Hazards: - Shock (electrical) - Carbon monoxide emissions and fuel-related fire hazards (fueled) - Fires/burns from hot surfaces.	☐ Follow general safety practices for Operation of Equipment/Machinery (above), and as follows: • Keep heater dry and locate heater on level surface away from high traffic areas to prevent tipping. • Never use fuel-powered heaters indoors, or near air intake vents, due to carbon monoxide hazard. • Provide ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Keep combustible materials at least 3 feet from hot surfaces. • Plug electric heaters directly into wall outlet (don't use extension cord or power strip). • For electric heaters, see **D.10., "Electrical Work Tasks."** • Shut down fuel-powered equipment before refueling; see safe practices for flammable/combustible liquids and/or compressed gases in **D.14. "Commercial Chemical Products."**
☐	**LOCKOUT/TAGOUT (LO/TO) OF HAZARDOUS ENERGY** To prevent unplanned equipment start-up or release of energy when under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
	HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-135: Hearing Protection Program, HSE STD-150: Globally Harmonized System for Hazard Communication (for fuel), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-452a: Lock-out/Tag-out (North America-only), HSE SOP-454a: General Electrical Safety (US-only), HSE SOP-642: Powered Hand Tools; HSE SOP-654: Welding, Cutting and Other Hot Work*	

D.7. DRILLING (Test Boring, Direct Push, Construction Drilling) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**DRILLING & DIRECT PUSH** Includes hazards posed by drilling rig and associated equipment, heavy support vehicles, trailer/towing hazards, and similar mobile equipment. Hazards: - Struck-by equipment - Run over, roll-over - Caught between (pinch points) - Manual lifting, musculoskeletal - Fuel/fluid leaks, fuel hazards - Suspended equipment - Roadway hazards	☐ Follow safe work practices, as applicable: • Non-drilling personnel shall stay clear of drilling work zone when drill rig in operation. • Equipment shall be maintained in good repair, inspected daily upon mobilization; backup alarms and emergency stop operational, machine guards in place, whip checks on high pressure lines. • Leaks or defective safety equipment will be repaired before use. • Establish eye contact with operator and use hand signals prior to approaching the rig. • Use PPE near operating rig (eye/head/hearing/hand/foot protection, high visibility vests or equivalent). • Arrange personal/support vehicles to protect drill team and not obstruct travel lanes or other operations. • Operators/helpers must maintain safe distance from moving parts; secure loose hair/clothing, equipment. • Drill rigs will only be moved with masts lowered. • Maximum safe slope for rig will be followed, drill rig leveled, appropriate blocking/cribbing as needed. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Ventilate exhaust and conduct air monitoring, as appropriate, when drilling indoors. • Never climb drill mast without appropriate fall protection. • Use precautions for overhead and underground utilities.
☐	**MECHANICAL LIFTING, RIGGING** Applies to lifting truck-mounted boom rig (e.g., drill rig), and all other drilling-related mechanical/electrical hoist equipment. Hazards: - Mechanical hazards - Elevated loads	☐ In addition to general drilling & direct push safety practices (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom, and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-430: Drilling Activities, SOP-434a: Overhead and Underground Utility Hazards (US-only),* HSE SOP-644: Working Around Heavy Equipment,

D.8. CONSTRUCTION, HEAVY EQUIPMENT, LIFT EQUIPMENT ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**WORKING NEAR MOBILE HEAVY EQUIPMENT, ON-SITE VEHICLES** Hazards: - Struck-by - Caught between - Run over, roll over - Overhead hazards/obstructions - Elevated loads	☐ For personnel on-foot/on-the-ground near operating heavy equipment, follow safe work practices: • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Maintain unobstructed vision: wear shaded eyewear only in bright sun; don't wear hoods. • Erect barriers and post signs to identify and isolate the equipment hazard zone, if possible. • Stay out of swing radius of equipment, both in front and operating end, as well as at the back of equipment. • Stay out of the travel path of operating heavy equipment. • When crossing vehicle pathway behind moving equipment, cross at a distance not less than 30 feet. • When approaching equipment, always be able to see operator so he/she can see you. • Make eye contact with operator and use hand signals or make radio contact prior to approaching equipment. • Operator shall provide "all off" hand signal when it is safe to approach within swing radius of equipment.
☐	**OPERATION OF MOBILE HEAVY EQUIPMENT** Hazards: - Struck-by - Run over, roll over - Caught between (pinch points) - Fluid leaks/fuel-/fire-hazards - Overhead hazards/obstructions - Potential for body entrapment/crushing - Rotating equipment, moving parts.	☐ Operators shall follow safe work practices for operation of heavy equipment: • Only trained/qualified persons allowed to operate heavy equipment. • Wear seat belts; roll-over protection system present/deployed; do not exceed maximum safe slope. • No passengers on moving/operating equipment except where passenger seat/restraint is present. • Equipment inspected daily upon mobilization; maintained in good repair, backup alarms, windows clear. • Leaks or defective safety equipment should be repaired before use; fire extinguisher present. • Maintain eye contact with ground personnel and use hand signals to direct their approach near equipment. • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Cease operation if personnel enter swing radius, travel path or hazard zone of moving parts, elevated loads. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Equipment locked, secured, brakes set, buckets/forks lowered, extendable parts retracted, when not in use. • Shut down/lock out equipment to prevent crush situation beneath or between moving parts of equipment. • Ensure personal/support vehicles are parked/located to not obstruct equipment travel lanes/operating zones. • Mark temporary roadways clearly, provide berms/stops where needed. ***HSE Program Documents:*** HSE SOP-644: Working Around Heavy Equipment
☐	**TRENCHING/EXCAVATION** Hazards: - Cave-in, entrapment - Hazardous atmosphere - Water accumulation - Falls into excavations	☐ Safe work practices when personnel will enter trenches/excavations: • Activities under supervision/oversight of Competent Person, conduct daily inspection of excavation. • Excavated materials placed at least 2' from trench sidewall. • Prevent water accumulation in trench. • Sloping & shoring for trenches/excavations >20' deep must be approved by a Professional Engineer.

	- Utility-related hazards - Undermining structures & foundations	• Sloping/shoring/trench box for excavations >5' when persons enter trench/excavation. • Sloping/shoring/trench box for shallow (<5') trench/excavation with cave-in hazard. • Workers in trenches shall be within 25 feet of ladder or sloped entryway. • Excavations shall be protected by perimeter fencing (not barricade tape), if potential for personnel to fall into. • If potential for atmospheric hazard, see **D.12. "Confined/Enclosed Spaces"** ***HSE Program Documents:*** HSE SOP-432: Excavation and Trenching Activities
☐	**FORKLIFT** Hazards: - Struck-by - Run over/roll over/tip over - Overhead utilities/obstructions - Caught between (pinch points) - Unstable/falling loads - Elevated forks - Fluid leaks	☐ In addition to general safety practices for heavy equipment (above), as applicable: • Qualified operator, per established forklift training (certificate is required); Geosyntec operator must be approved by Director of Health and Safety. • Equipment inspected daily and documented on Forklift Preoperational Inspection Checklist. • Do not exceed lifting load limits. • Forklift shall not be moved/driven with empty forks in raised position. • When not in use, forks lowered, brake set, controls in neutral, key removed. ***HSE Program Documents:*** HSE SOP-436: Safe Operation of Forklifts and Mobile Equipment
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - Falls from basket - Overhead utilities/obstructions - Struck-by, run over, tip over - Caught between (pinch points) - Tip over - Fluid leaks	☐ Follow safe work practices: • Operators shall be appropriately trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn when operating a boom lift (optional for scissor lift). • Overhead hazards and surface obstructions shall be reviewed with operators/riders prior to use. ***HSE Program Documents:*** HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)
☐	**CRANES** Hazards: – electrocution by overhead utility – injury in swing radius – injury from falling load – crane tipping over due to overbalancing, high winds, unstable ground, unsafe slope, bad placement of outriggers – injury from mechanical hazards	☐ In addition to general safety practices for Operation of Heavy Equipment (above), as applicable: • Only qualified persons operate cranes (certificate required). • Critical Lift Plan & Checklist prepared/executed (See Procedure) prior to mobilization. • Equipment shall be inspected prior to mobilization and daily by crane operator. • Crane operator will remain at the controls at all times during operation. • Crane operation must be performed under the direction of an appointed signal person at all times using hand signals and/or voice/radio communication. • Crane shall be level and stable (solid ground or crane mats/timbers, outriggers if present, cribbing); over-reaching or exceeding load limits is prohibited. • Keep area beneath suspended loads clear of personnel; tag lines used to maneuver load. • Rigging procedures – see Mechanical Lifts with Rigging, below.
☐	**MECHANICAL LIFTS WITH RIGGING** Applies to lifting by rigging attached to crane, truck-mounted boom rig (e.g. drill rig), heavy equipment, mechanical/electrical hoist, similar equipment. Hazards: – Mechanical hazards – Elevated loads	☐ In addition to general safety practices for Operation of Heavy Equipment and Cranes (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Coordinate lifting operations with competent person. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device (such as davit arm) are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads and that tag lines are used where appropriate.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*
☐	**DEMOLITION**	☐ Develop/implement a demolition safety plan.
☐	**BLASTING, UNEXPLODED ORDNANCE**	☐ Develop/implement safety plan for blasting, unexploded ordnance, as applicable. ***HSE Program Documents:*** *HSE SOP-622: Blasting & Use of Explosives*
☐	**PUBLIC AT RISK, SITE SECURITY**	☐ During site operations protect public (overhead protection, fencing, barriers, warning signs). ☐ During off hours, protect public with fencing, barriers, warning signs/lights, other measures as appropriate. ☐ Lock/secure hazardous materials and/or equipment.

D.9. STORAGE/HANDLING OF BULK MATERIALS (for *Chemical* Storage, see D.14 & 15) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:	
☐	**BULK STORAGE HAZARDS:** ☐ Store materials in stable manner (stacked, racked, blocked, interlocked, tied, wrapped, or otherwise secured) to prevent tipping, sliding, rolling, falling or collapse.

	Collapse/movement of stacked/stored bags, blocks, containers, pipe, boxes, equipment, and similar. ☐ Stack/pallet/rack/shelf ☐ CONEX-box storage, or similar	☐ Do not exceed load limits and ensure storage structure is stable, robust, secure for intended load. ☐ Ensure stored materials do not block aisles, passageways, electrical panels, emergency equipment, emergency access/egress routes, vehicle routes.
☐	**LIFTING/MANUAL MATERIAL HANDLING HAZARDS**	☐ During manual handling of materials and equipment, use safe lifting practices and/or lift aids; do stretches and use safe postures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.10. ELECTRICAL WORK TASKS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**USE OF BATTERIES, BATTERY-POWERED EQUIPMENT <50 V, OR OTHER DC EQUIPMENT < 50 V** Potential fire hazard (if terminals are shorted), eye/skin hazards (when electrolyte is replenished), inhalation hazard in enclosed spaces.	☐ Follow safe work practices to control hazards of voltage, shock, arcing, overheating, hazardous gases, irritant electrolytes, secondary hazards. ☐ Prevent short-circuiting of terminals when battery is in use (segregated from tools, metal objects) and during transport (use battery transport container or install guard/cover on positive terminal). ☐ For batteries requiring replenishment of electrolyte, use PPE for eye and skin protection, and have eyewash equipment at hand; see discussion of *acids/caustics/corrosives* in **D.14. "Commercial Chemical Products."**
☐	**"NORMAL OPERATION" OF ELECTRICAL EQUIPMENT CONNECTED TO AC OR DC POWER SOURCE ≥ 50 V:** Electrically powered tools, equipment, machinery, extension cords, portable generators, working near electrical equipment. Hazards: – Electrical shock – Fire Hazard – Secondary hazards (falls, other injuries).	☐ Follow "normal operation" requirements: • All electrical enclosures/guards/covers must be in place/closed/secured. • Electrical equipment maintained per codes/standards/manufacturer's recommendations. • Ensure no indication of damage or impending failure (heat, smoke, buzzing, odors, arcing, melting). • Operate equipment in accordance with manufacturer's standard operating procedures. ☐ Follow general electrical safety work practices to minimize shock hazard and secondary hazards: • Control water-related/wet-location hazards in a manner appropriate for the job tasks/equipment/tool. • Never touch electrical equipment if you are wet or standing/kneeling in water or on wet surfaces. • Use extension cords/power cords properly, rated for use conditions and current draw, prevent damage. • Inspect tool/equipment/extension cords/power cords before each use; remove from use if damaged. • Use GFCI-protected outlet or portable GFCI in wet/moist locations, outdoors, basements, concrete floors. • Do not enter any space delineated by an electrical approach boundary.
☐	**HANDS-ON DIAGNOSTICS/REPAIR ON CIRCUIT(S) CONNECTED TO POWER SOURCE < 50 V:** ☐ AC ☐ DC ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Stray voltage from soil electrodes	☐ Implement electrical safe work practices pertaining to: • Workers trained appropriately for the task. • Shock prevention measures. • Eye/skin protection for arcing hazards. • Protection from secondary hazards.
☐	**WORK WITHIN *"APPROACH BOUNDARY"* OF EXPOSED, ENERGIZED (OR POTENTIALLY ENERGIZED) CONDUCTORS AND/OR CIRCUIT PARTS CONNECTED TO POWER SOURCE 50-600 V*:** ☐ AC ☐ DC ☐ 3-phase ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Induced voltage ☐ Stray voltage ≥50V from soil electrodes *** Working on >600 V not permitted for Geosyntec personnel**	☐ Prepare project-specific written "Electrical Safety Program" addressing (at a minimum): • Workers trained/designated as "Qualified Electrical Workers" per NFPA 70E (US)/CSA Z462 (CAN) • Assess risks of electrical shock (voltage levels and sources), arc flash hazard and secondary hazards. • Affix electrical hazard warning label to electrical enclosure(s) to be accessed. • Physically delineate arc flash- or limited approach boundary, whichever is farthest from hazard source. • Only "qualified" workers allowed within approach boundaries; prevent entry by non-qualified personnel. • Establish electrically safe working condition; work on live circuits prohibited (except for diagnostic testing). • Use PPE for shock/arc flash protection, as required. • Use other safe procedures/equipment required for the task, such as lockout/tagout.
☐	**LOCKOUT/TAGOUT (LO/TO) OF ELECTRICAL ENERGY** To prevent unplanned start-up or release of energy when equipment is under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only), HSE SOP-452a: Lock-out/Tag-out (North America-only) HSE SOP-454a: General Electrical Safety (US-only)*

D.11. UTILITY-RELATED HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Both a public utility locate ticket was submitted and a private locator will locate the immediate sub slab sampling areas.

☐	**OVERHEAD, ABOVE-GROUND UTILITIES**	☐ Do not cross approach boundaries with personnel or equipment; employ other appropriate precautions for the conditions (specify above). ☐ Use additional controls, as applicable: shielding, flagging, observer/monitor, or, ☐ Arrange for power company/utility owner to de-energize power line.
☒	**UNDERGROUND UTILITIES**	☒ Confirm appropriate underground utility clearance procedures have been completed prior to ground penetrations, and employ other utility clearance/locator practices, as appropriate for conditions. ☐ Hand digging/augering or vacuum post-holing within 3' of utility locations or other high-risk condition.

HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.12. CONFINED / ENCLOSED SPACES (Including Hazardous Indoor Spaces) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

Type of CONFINED/ENCLOSED/ HAZARDOUS INDOOR Workspace:
- ☐ Indoors (occupied)
- ☐ Indoors (abandoned, vacant)
- ☐ Basement, crawl space, attic
- ☐ Tunnel, shaft, inspection gallery
- ☐ Storage bin, locker
- ☐ Culvert, catch basin, sewer
- ☐ Well vault, utility vault, manhole
- ☐ Tank, vessel, silo, vat, hopper
- ☐ Trench, excavation
- ☐ Machine/equipment pit
- ☐ Transportation container, railcar
- ☐ Other – describe above

Confirmed or potential hazards:
- ☐ Flammable/explosive
- ☐ Oxygen deficiency
- ☐ Hydrogen sulfide
- ☐ VOCs
- ☐ Carbon monoxide
- ☐ Combustible dust
- ☐ Combustion/exhaust emissions
- ☐ Welding/cutting fumes
- ☐ Electrical
- ☐ Mechanical equipment
- ☐ Entrap, engulf, drowning
- ☐ Building-related hazards
- ☐ Other – describe above

REQUIREMENTS:

1. **Contact Corp. HSE Department** will determine applicability of confined space entry regulations, and to determine safe work practices for entry into any confined, enclosed or hazardous indoor spaces.

2. **Classify the work task** by checking **one** of the following:

   ☐ **CONFINED SPACE** classified by regulatory authority as a "**Permit-Required Confined Space**" or otherwise specifically-regulated as a **confined space** in the worksite's geographic jurisdiction.

   ☐ **CONFINED/ENCLOSED/INDOOR space NOT specifically regulated as a Confined Space;** develop site-specific entry procedure **per applicable regulatory and Geosyntec safety requirements**.

3. **Delineate tasks, hazards and controls** associated with the work in **Section C.1. "Summary of Tasks, Hazards and Controls,"** and in applicable sections in **Parts C, D and E of this THA**; incorporate or attach applicable safety provisions such as, but not limited to, the following:
   - Risk assessment; entry plan, entry permit system/safety checklist.
   - Air monitoring for atmospheric hazards.
   - Entry roles (supervisor, entrant, attendant), buddy system, regulatory training requirement.
   - Protect non-entry personnel from unauthorized entry (labels, signage, barriers)
   - Ingress/egress (stairway, ramp, ladder, tripod/winch, harness/lifeline, etc.).
   - Communication/alerting/rescue/emergency plan.
   - Entry hazard controls:
     - Isolate, clean, purge, inert, lockout/tagout, fire prevention.
     - *Dilution* ventilation to introduce fresh air
     - *Exhaust* ventilation to control point source of emissions.
     - Use duct/stack to direct hazardous emissions away from work area.
     - Respiratory protection.
     - Use PPE and safety gear to protect from chemical/physical/biological hazards.
     - Fall protection.
     - Traffic control.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE SOP-412a: Confined Space Entry Operations (US-only), HSE SOP-460: Field Site Exposure Monitoring*

D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

HAZARD TYPE:
- ☐ Contagious respiratory illness
- ☐ Vector-borne infectious risk
- ☐ Wastewater, sewer, landfill
- ☐ Animal/human waste
- ☐ Wildlife contact, infectious risk
- ☐ Mold, fungi, valley fever
- ☐ Bloodborne pathogens
- ☐ Discarded syringes
- ☐ Medical waste
- ☐ Other (describe above)

- ☐ Follow internal guidance for mitigating airborne respiratory illness transmission (as applicable).
- ☐ Implement vector-protective measures (see also **Section D.1.b., "Biological Hazards"**)
- ☐ Use "Standard/Universal Precautions" as applicable to mitigate exposures to infectious/pathogenic hazards.
- ☐ Low hazard – use basic hygiene: onsite hand washing (soap & water preferred) and protective apparel/PPE.
- ☐ Med/high hazard – added PPE (gloves/barriers/respirator/dust mask), decon, remediation, as appropriate.
- ☐ For bloodborne human pathogens follow Bloodborne Pathogen Program and Standard/Universal Precautions.
- ☐ Contact HR Dept. for project-specific immunization (e.g. tetanus/diphtheria/pertussis [Tdap], hepatitis A/B).
- ☐ Implement remedial actions to mitigate infectious hazard source (remove syringes, clean up unsanitary waste/debris, decon/disinfect surfaces, etc.) as appropriate for the scope/scale of work.

HSE Program Documents: *HSE SOP-240: Mitigating Respiratory Illness Transmission in the Workplace*, *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants, HSE SOP-612a: Bloodborne Pathogens (US-only)*

D.14. COMMERCIAL CHEMICAL PRODUCTS (per HAZCOM or WHMIS) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**PRODUCTS REGULATED BY HAZCOM[1] (US) or WHMIS[2] (CAN)**	☐ Safety Data Sheets (SDSs) available, either on site or readily available within same work shift, containers labelled properly, workers trained/oriented on hazards. ☐ For subcontractor/contractor use of chemical products, confirm SDS availability for affected onsite workers.
	[1] OSHA Hazard Communication Standard (United States); [2] Workplace Hazardous Material Information System (Canada)	
☐	**GENERAL SAFE WORK PRACTICES FOR FIELD USE OF CHEMICALS**	☐ Consult SDS for HSE hazards, symptoms of exposure; ensure workers have been apprised of safe practices. ☐ Handle with care, maintain good housekeeping, provide adequate illumination in work area. ☐ Pour/dispense/transfer liquid chemicals on stable work surface. ☐ Use chemicals in well-ventilated area; use fans/blowers/exhaust for active ventilation, as appropriate. ☐ Have eyewash bottles, eyewash station, deluge capabilities, commensurate for the hazard, readily available. ☐ Have spill/neutralization equipment, appropriate for the chemicals, readily available. ☐ Conduct air monitoring as appropriate; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**STORAGE/TRANSPORT OF CHEMICALS/HAZMAT** ☐ **Non-Emergency (Routine) Chemical Storage** Risk of personal contact and/or incidental release ☐ **HAZMAT Transport** ☐ **Risk of Emergency Spill/Release** ☐ **CFTAS (Chemical Facility Anti-Terrorism Standards) Applicability:** On-site overnight storage of non-waste chemical product at quantity ≥25 gal(115L) or ≥250 lbs. (115 kg)	☐ Transport chemicals only in sealed containers, secured to prevent shifting/breakage during travel. ☐ Store chemicals only in sealed containers; overnight storage in squirt/spray bottles prohibited. ☐ Store flammable/combustible liquids in chemical storage cabinets, or other appropriate storage arrangement. ☐ For liquids, provide secondary containment during storage. ☐ Segregate incompatible chemicals during storage. ☐ For *incidental release/spill;* maintain spill kit suitable for low flammability/toxicity/quantity/volatility release. ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/ Transportation.** ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate emergency response contact in Part B, "Emergency Response and First Aid." ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable. ☐ For CFTAS-applicable chemical storage, a safety and chemical management plan must be prepared and reviewed by a HSE Professional before bringing material to the site. (Does not apply to materials brought on to the site for daily work purposes and transported away at the end of each day)
☐	**COMPRESSED GAS CYLINDERS** ☐ Flammable ☐ Non-flammable ☐ Toxic ☐ Asphyxiant ☐ Oxygen	☐ Secure cylinders upright, caps on when not in use. ☐ Handle with care; use and store cylinders in a manner and location to prevent damage. ☐ Propane cylinders not in use must be stored outdoors in a cage or similar secure ventilated enclosure. ☐ Ensure acetylene cylinders are NOT secured to steel arc welding bench. ☐ Segregate oxygen and fuel gases by distance (20') or fire-rated barrier. ☐ Control ignition sources. ☐ "No smoking" signage at cylinder storage area for flammable gases.
☐	**FLAMMABLE/COMBUSTIBLE LIQUIDS**	☐ Use proper fuel safety can (metal fuel container with self-closing spout and flame arrestor preferred). ☐ Control/remove ignition sources near storage and use areas. ☐ Grounding and bonding where appropriate. ☐ Ensure a Type B or ABC fire extinguisher is readily available.
☐	**ACIDS, CAUSTICS, OTHER CORROSIVES**	☐ Use appropriate protection for eyes/face (goggles/face shield) and skin (gloves, sleeves, apron). ☐ Use eyewash, deluge shower, drench hose, hand washing (with water), as appropriate. ☐ For severe eye hazards (due to high corrosivity, large quantity), 15-min. eyewash required.
☐	**TOXIC**	☐ For toxic substances, use/store in a manner to control exposure hazards (inhalation, ingestion, skin contact, skin absorption); use active ventilation and/or PPE as appropriate.
☐	**EMISSIONS FROM FUEL COMBUSTION, HOT PROCESSES** ☐ Gasoline ☐ Diesel ☐ Propane/Natural Gas ☐ Welding/cutting/hot work ☐ Vehicle/equipment exhaust ☐ Other	☐ Position outdoor personnel upwind of exhaust source. ☐ Avoid "idling" of equipment when not in use. ☐ Use *passive ventilation* (air infiltration/air currents) to disperse atmospheric hazards in breathing zone. ☐ Use *dilution ventilation* (blowers/fans) to provide fresh air to work area and dissipate atmospheric hazards. ☐ Use *exhaust ventilation* (hood/duct/exhaust stack/blower) to capture/divert exhaust from work area. ☐ Use respiratory protection for high levels of smoke, exhaust particulates, soot. ☐ Conduct air monitoring as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
☐	**OTHER HAZARDS**	☐ Describe other hazardous substances and safety measures under "Site-Specific Notes & Clarifications," above.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-460: Field Site Exposure Monitoring*

D.15. SITE CONTAMINANTS, CHEMICAL WASTES ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Chlorinated solvent tetrachloroethylene and daughter products resulting from former dry cleaning operations. Drilling though tile or concrete could result in crystalline silica dust exposure. A dust mask or other dust control such as a vacuum will be used.

CHECK ALL THAT APPLY. Provide site-specific notes/clarifications above.

☒ Soil/groundwater contaminants (historical release)	☐ Explosive dust	☐ Potential for flammable gas (methane)
☐ Recent release, known high concentrations	☐ Oxygen deficiency	☐ Corrosive, acids/caustics, strong irritants
☐ Former chemical disposal site, landfill	☒ Chlorinated volatile organic compounds (VOCs)	☐ Asbestos abatement work
☐ Urban fill, residual contaminants	☐ BTEX, petroleum derived VOCs	☐ Pesticides, herbicides, fungicides
☐ Containerized waste (drums, process equipment)	☐ Fuel oils, petroleum, waste oil, lubricants	☐ Sensitizers
☐ Buried drums (known or potential)	☐ Metals, metal compounds, metal dusts	☐ Radioactive contaminants
☐ Large containers, potential for spills	☐ Elemental mercury	☐ Controlled substances, drugs
☐ Contaminated building surfaces	☐ Polyaromatic hydrocarbons (PAHs)	☐ Wildfire smoke, see *HSE SOP 470a Protection from Wildfire Smoke Exposure*
☐ Unexploded ordnance	☐ Potential for flammable vapors	☐ Other - describe above

NOTE: For sites with one or more **"high-risk contaminants"** (below) designated/recognized as a *contaminant of concern*, or *exceeding an environmental reporting threshold*, or representing a *potential exceedance of an action level or exposure limit*, the THA must be reviewed by the HSE Dept. before initiating the work:

☐ Asbestos	☐ Chromium VI (hexavalent chromium)	☐ Lead
☐ Arsenic/arsenic compounds	☒ Crystalline Silica (airborne)	☐ Methylene chloride
☐ Benzene	☐ Dioxins	☐ Polychlorinated biphenyls (PCBs)
☐ Beryllium	☐ Mercury	☐ Vinyl chloride
☐ Cadmium	☐ Hydrogen Cyanide (HCN)	

☐ **FOR WORK CONSISTING OF CLEANUP OPERATIONS, CORRECTIVE ACTIONS, PRELIMINARY INVESTIGATIONS at an "UNCONTROLLED HAZ. WASTE SITE" (per HAZWOPER, 29 CFR 1910.120 or equivalent), delineate procedures in "Site-Specific Notes and Clarifications" (or attachments) addressing the following, as applicable to the work:**

- Workers attend **pre-work orientation** on hazards, risks, onsite safety measures, emergency contingencies.
- Implement **site control plan** - delineate Exclusion Zone(s), Contaminant Reduction Zone(s), Support Zone (aka EZ, CRZ, SZ).
- Include **site map/figure** depicting work locations and other relevant site-specific information.
- Site workers in EZ or CRZ shall have **40-hour HAZWOPER training**, current 8-hour refresher, 3 days supervised field experience.
- Site supervisor(s) shall have **8-hour Supervisor training**.
- Site workers in EZ or CRZ shall participate in **medical monitoring** program, as applicable.
- Implement **site-specific procedures** for worker protection via engineering controls, work practices, personal protective equipment (PPE), air monitoring, decontamination procedures, spill containment, emergency preparedness and response.
- Conduct **air monitoring**, as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
- **PPE program: S**pecify **Levels of Protectio**n and specific PPE to be used for applicable tasks;
  - **Level D**: No respirator, no chemical protective clothing, standard work clothes, basic PPE; (COVID-19 face covers allowed)
  - **Modified Level D**: No respirator, chemical protective clothing as appropriate; (COVID-19 face covers allowed)
  - **Level C**: Air-purifying respirator, chemical protective clothing as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level B**: Air-supplied respirator, chemical protective clothing/suit as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level A**: Fully encapsulating suit, self-contained breathing apparatus (SCBA); **Level A prohibited for Geosyntec personnel.**

☒ **FOR SITE WITH CHEMICAL CONTAMINANTS OR WASTE BUT NOT REGULATED BY HAZWOPER**

- Workers shall be knowledgeable/aware of chemical hazards thru safety training/orientation and availability of hazard information.
- Implement controls to minimize worker exposure through engineering controls, work practices, PPE, decon, as appropriate.
- Evaluate worker exposure via air monitoring/sampling, as applicable; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**

☐ **STORAGE/TRANSPORT OF IDW***

Spill/Release Risk:

☐ Risk of *incidental spill/release*

☐ Risk of *emergency spill/release*

** Investigation-Derived Waste*

- ☐ Describe site-specific procedures above for spill containment, container handling, as applicable.
- ☐ For liquids, provide secondary containment during storage.
- ☐ Segregate incompatible chemicals during storage.
- ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable.
- ☐ For *incidental spills*; spill kit on-site for low-hazard releases (low-flammability/toxicity/quantity/volatility)
- ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate Emergency response contact in Part B, "Emergency Response and First Aid."
- ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/Transportation."**

☐ **OFF-SITE MIGRATION OF AIRBORNE CONTAMINANTS**

- ☐ Implement controls to minimize hazard migration (dust suppression, covers, foam, etc.).
- ☐ Community/perimeter air monitoring will be conducted per perimeter air monitoring plan; see **E.3 "Fence Line/Perimeter Air Monitoring."**

***HSE Program Documents**: HSE STD-120: Occupational Medical Management Program, HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-301a: Contaminated Site Investigation & Remediation (US-only), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-634: Drum Sampling, HSE SOP-636: Handling of Uncharacterized Hazardous Waste Containers , HSE SOP 470a Protection from Wildfire Smoke Exposure*

D.16. RADIATION HAZARDS (Other than Sunlight) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.17. SHIPPING/TRANSPORTATION HAZMAT/DANGEROUS GOODS ☐ Applicable ☒ Not Applicable, Not Anticipated

MODE(S) OF TRANSPORT:	☐ Road	☐ Rail	☐ Air	☐ Sea	☐ Inland Waterway	☐ International

IMPORTANT: Ensure that each individual who will be involved in shipping/transportation of hazardous material is current with required training (awareness, function-specific, safety, security) in accordance with applicable regulatory authority (DOT, FAA, IATA, TDG), and ensure adherence to applicable regulations.

HSE Program Documents: *HSE SOP-235a: Hazardous Materials Shipping (US-only)*

Site-Specific Notes & Clarifications: Transporting small helium tanks via field vehicle to and from the site.

PART E – AIR MONITORING, WORKER EXPOSURE MONITORING

E.1. AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes, Clarifications: concrete dust produced during drilling.

AIR-TESTING PARAMETERS - Select site-specific testing parameters; list associated equipment in Part C.2, Safety Equipment List.

☐ **VOCs** ☐ **PID** (Photoionization detector): **X** eV ☐ **FID** (Flame ionization detector) ☐ **Colorimetric indicator tubes** – describe above	☐ **O_2** (Oxygen) – oxygen meter ☐ **LEL** (Lower Explosive Level) - LEL meter ☐ **H_2S** (Hydrogen Sulfide) – H_2S detector ☐ **CO** (Carbon monoxide) – CO detector	☐ **Particulates** - total dust meter ☐ **% Methane** – methane meter ☐ **Calibration kit** for each parameter ☐ Other:

SUBSTANCE-SPECIFIC (PRE-SET) ACTION LEVELS - Sustained breathing zone action levels (sustained general work-area levels for LEL).

☐ **O_2** (Oxygen)	**19.5-23%**	Acceptable to continue work without O_2-focused respiratory protection.
	<19.5%	STOP WORK, ventilate to raise O_2 to >19.5% for re-entry. For persistent hazard, contact Corp. HSE Dept.
	>23.0%	STOP WORK, ventilate to lower O_2 to <23% for re-entry. For persistent hazard, contact Corp. HSE Dept.
☐ **LEL** (Lower Explosive Limit)	IMPORTANT:	Confirm sufficient oxygen is present (min. 8-12%) to ensure accurate LEL readings.
	<10% LEL	Acceptable to continue working in work area; continue to monitor LEL.
	≥10% LEL	STOP WORK. Implement controls (reposition workers, ventilate, contain/eliminate source, etc.); resume work ONLY when LEL readings are <10%, sustained.
☐ **H_2S** (Hydrogen Sulfide)	**< 1 ppm**	Acceptable to continue work without H_2S-focused respiratory protection.
	1-10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <1ppm, or use APR* with *VOC/acid-gas* cartridges (yellow); do not exceed MUC* for respirator type; confirm acceptability of respirator usage with HSE Dept.
	> 10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <10ppm (with respirator), or <1ppm (without respirator). For persistent levels >10 ppm, STOP WORK, contact task lead, PM or HSE Dept.
☐ **CO** (Carbon Monoxide)	**< 25 ppm**	Acceptable to continue work without CO-focused respiratory protection.
	≥ 25 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <25ppm. For persistent levels >25ppm, STOP WORK, contact PM and/or HSE Dept.
☐ **WILDFIRE SMOKE** (AQI for PM 2.5)	**≤69**	In this **Air Quality Index (AQI)** range, it's acceptable to continue work without respiratory protection.
	>69 – <100	Voluntary use of N95 respirator is appropriate.
	>101 – <500	Distribute N95 respirators to all personnel Provide work and/or rest areas in enclosed buildings. Relocate work indoors, or to an outdoor location with a lower AQI; Changing work schedules so outdoor work can occur when the AQI is lower; Providing portable HEPA filters in enclosed areas; Reduce the amount of work that involves physical exertion, and provide additional rest periods. Consider rescheduling fieldwork to a date/time when the AQI is likely to be lower.
	>500	STOP WORK, or use APR* with approval of HSE Dept.
☐ **<OTHER>**		

SITE-DERIVED ACTION LEVELS – Sustained breathing zone action levels; derived based on site contaminants; REVIEW WITH CORP. HSE DEPT. REQUIRED.

☐ **VOCs** (Volatile Organic Compounds)	**< X ppm**	Acceptable to continue work without VOC-focused respiratory protection.
	> " ppm	Implement controls (reposition workers, ventilation, containment, eliminate source, etc.) to lower VOC exposures to less than specified action level, or use APR* with approval of Corp. HSE Dept.
	X to X ppm	Use APR* with *VOC* cartridges (yellow or black); do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.
	> X ppm	STOP WORK. Implement controls, for persistent levels greater than action contact PM and/or HSE Dept.
☒ **AIRBORNE DUST** (Total Particulates)	**< X mg/m³**	Acceptable to continue work without particulate-focused respiratory protection.
	> " mg/m³	Implement controls (water spray, reposition workers, ventilation, containment, etc.) to lower dust levels to less than specified action level, or use APR* with approval of HSE Dept.
	X to X mg/m³	Use APR* with particulate cartridges appropriate for the hazard; do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.

	> mg/m³	STOP WORK. Implement controls. For persistent levels greater than action level, contact PM and/or Corp HSE Dept.
☐ <OTHER>		

* Air-purifying respirator ** Maximum use concentration

HSE Program Documents: *HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP 470a Protection from Wildfire Smoke Exposure*

E.2. OTHER WORKER EXPOSURE MONITORING / SAMPLING ☐ Applicable ☒ Not Applicable, Not Anticipated

☐ Heat/Cold Stress Testing/Monitoring	☐ Wildfire Smoke – Tracking AQI (Air Quality Index)	☐ <Other>
☐ Air Sampling *(sample collection, passive dosimeter)*	☐ Ionizing or Non-ionizing Radiation Testing	☐ <Other>
☐ Wipe/Bulk Sampling *(to evaluate worker exposure)*	☐ Noise Testing	

Site-Specific Notes, Clarifications:

HSE Program Documents: *HSE STD-135: Hearing Protection Program, HSE STD-140: Radiation Safety Program, HSE SOP-230: Ionizing and Non-Ionizing Radiation Protection, HSE SOP-409: Heat Illness Prevention, HSE SOP-410: Cold Stress Prevention, HSE SOP-462: Asbestos Exposure Control, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP-468a: Respirable Crystalline Silica Exposure Control (US-only), , HSE SOP 470a Protection from Wildfire Smoke Exposure*

E.3. FENCELINE / PERIMETER AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Fence line/perimeter air monitoring to be conducted in accordance with a separate **"Perimeter Air Monitoring Plan"** for this work; results from *fence line/perimeter* air monitoring shall NOT be used as the sole basis for determining *work zone* atmospheric hazards.

Site-Specific Notes, Clarifications:

PART F – APPROVALS, ACKNOWLEDGEMENTS

F.1. THA PREPARATION, REVIEW/APPROVAL SIGNATURES A THA is typically prepared by project staff, often with input from an HSC, with review/approval, at a minimum, by PM and/or Field Lead. Corporate HSE staff must be consulted as required or otherwise deemed appropriate*.

	Printed Name	***Signature***	***Date***
PREPARER(S)	Jensen Perrick		7/1/2025
THA REVIEWED/ APPROVED BY: (Project Manager or PM-Designee, at a minimum)**	***Printed Name***	***Signature***	***Date***

* At a minimum, Corp. HSE **must** review/approve the THA review when Geosyntec staff will encounter "high hazards/high risks," or perform critical tasks, such as (but not limited to):

- Work at heights >10', use personal fall apparatus
- Work at height near overhead electrical utility lines
- Operate a UTV/ATV, aerial lift or fork-lift
- Tow a trailer on roadway
- Oversee a hot-work permit system
- Enter a hazardous confined/enclosed space
- Use of unmanned aerial vehicle (drone)
- High-risk ergonomic/musculoskeletal hazard
- Implement lockout/tagout controls
- Enter a trench/excavation >5' deep
- Function as a construction "Competent Person"
- Operate a pneumatic or powder-actuated tool
- "Qualified" Electrical testing & maintenance >50 V
- High risk, non-typical infectious/pathogenic hazard
- Derive action levels for VOCs or toxic dusts
- Instrument monitoring for critical exposure risks
- Wear a respirator
- Presence of "high-risk" contaminant(s)
- Sustained exposure to wildfire smoke $AQI_{PM\ 2.5}$ >150
- Exposure to radioactive isotopes (α, β, γ)
- High-risk exposure to: non-ionizing (microwave, EMF, UV, IR) or ionizing (radio-isotope, x-ray) radiation.
- Onsite risk of emergency chemical spill
- Applicability of Chemical Anti-Terrorism Standards

Corporate HSE **must** also be consulted when Geosyntec subcontractors (*under Geosyntec's oversight*) perform high hazard/high risk work (such as demolition, blasting, crane critical lifts, confined space entry, testing/maintenance of electrical systems, lockout/tagout, HAZWOPER cleanup activities). Consultation with Corp. HSE is encouraged for all questions/concerns regarding worker safety, regulatory compliance, risk/liability aspects, or project-specific safety requirements.

** It is recommended that THAs be approved/signed by both the PM *and* Field Lead (or alternate PM designee), unless due to small scope/scale or routine nature of task, or staff unavailability, only one approval is deemed sufficient by PM. Additional review and approval will be performed by Corp. HSE for high-hazard/high-risk tasks, or as otherwise requested.

HSE Program Documents: *For more information, see "HSE STD-105, Project Safety Management Handbook".*

F.2. GEOSYNTEC FIELD CREW ACKNOWLEDGEMENTS

Please sign below to acknowledge you reviewed and understand this THA, participated in project safety briefing and had an opportunity to ask questions about the information herein.

Printed Name	Signature	Employee No.	Date

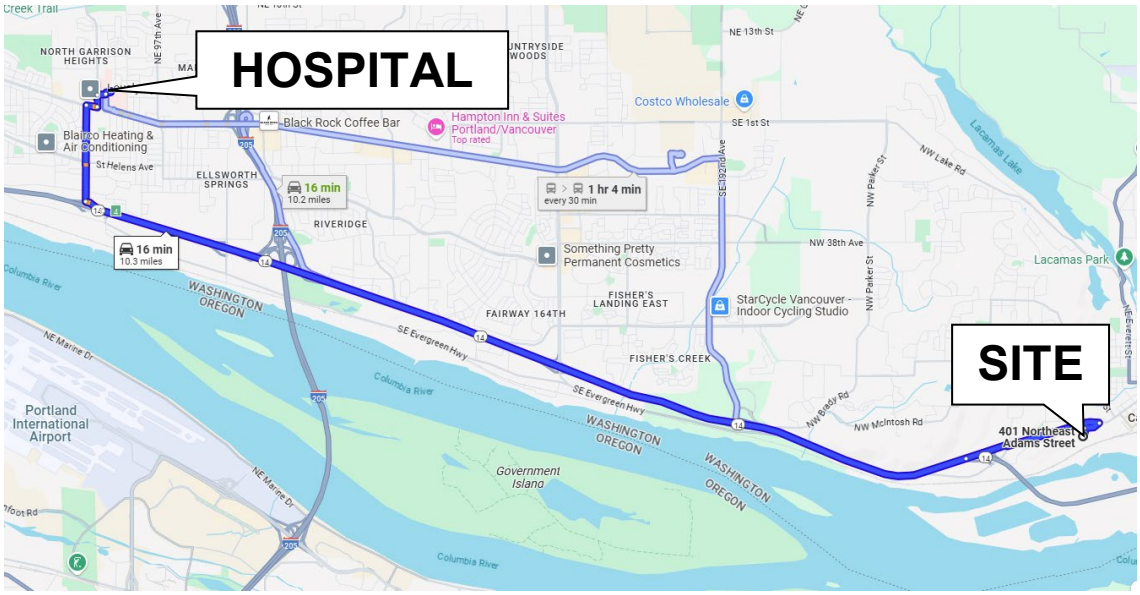
F.3. SUBCONTRACTOR'S FIELD CREW ACKNOWLEDGEMENTS ☐ Applicable ☐ Not Applicable

Please sign below to acknowledge this THA was made available to you, and you had an opportunity to ask questions about the information herein.

Printed Name	Signature	Company Name	Date

ATTACHMENTS:

Attachment A – Route to Hospital



Hospital Name: Peace Health Southwest Medical Center
Address: 400 NE Mother Joseph Place
Phone Number: (360) 729-8370

Directions To Hospital From Site:
Get on WA-14 from NW 6th Avenue (4 min, 1.4 mi)

- Head north toward NW 6th Avenue (371 ft)
- Turn right (0.1 mi)
- Turn left onto NW 6th Avenue (0.8 mi)
- At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Follow WA-14 W to S Lieser Road in Vancouver. Take exit 4 from WA-14 W (8 min, 7.8 mi)

- Merge onto WA-14 W (7.6 mi)
- Take exit 4 for Lieser Road toward SE 88th Ave (0.2 mi)

Continue on S Lieser Road. Drive to NE Mother Joseph Place (4 min, 1.1 mi)

- Turn right onto S Lieser Road (0.8 mi)
- Turn right onto E Mill Plain Boulevard (489 ft)
- Use the 2nd from the left lane to turn left onto NW 87th Avenue (0.1 mi)
- Turn right toward NE Mother Joseph Place (367 ft)
- Turn left toward NE Mother Joseph Place (335 ft)

HSE Event Response and Notification

Geosyntec consultants

CHOOSE THE BEST PATH!

EMERGENCY EVENT (catastrophic occurrence, injury or illness requiring emergency medical care, etc.) → **IMMEDIATELY CALL 911** or alternate emergency number for your locale* → **Conduct First Responses** (rescue/assist injured, stop work, evacuate, stabilize worksite, other**) → **Meet Arriving Emergency Responders** and apprise them of the situation (fire, ambulance, police, other) → **Notify HSE TEAM ASAP** by phone or EVENT NOTIFICATION TOOL

NOTIFY your Manager, Supervisor, Client, and other key contacts ASAP

COMPLETE full *Incident Report* within 24 hours (use link in followup email you'll receive after submitting an **EVENT NOTIFICATION**)

NON-EMERGENCY EVENT or **NEAR MISS** → **Stabilize the situation and provide initial care/support**** → **Notify HSE Team using EVENT NOTIFICATION TOOL within 1 hour after injury/illness or vehicle accident; by end of workday for other events.** → **For injury/illness or vehicle accident, HSE will attempt call-back within 1 hour of EVENT NOTIFICATION** → **Proceed as Directed by HSE for Medical Triage*** and other aspects**

GOOD CATCH (Observed unsafe condition or non-compliance, positive safety observation, improvement suggestion, etc.) → Submit a **Good Catch** using the EVENT NOTIFICATION TOOL (on same day of occurrence)

IMPORTANT: To load the **EVENT NOTIFICATION TOOL** onto your mobile device, scan this QR code:

* 911 in North America; 112 in EU; 999 & 112 both applicable in UK; 000 in Australia; for other country- or site-specific numbers, see your Written Safety Plan or Office Emergency Plan

** First response actions by site/project team should always be in accordance with general-duty obligations, on-site roles, and training qualifications

*** Employees may initiate a call for medical triage/support if no call-back received from HSE within 60 minutes of Event Notification, or if HSE is not available directly by phone. For the medical support contact in your location (*WorkCare in North America; location-specific elsewhere*) see your Written Safety Plan or Office Emergency Plan, as applicable

If you have questions or concerns about any workplace health and safety matter, please contact a member of your Corporate HSE Team for assistance:

Global HSE Director Bob Poll M: +1 813-240-9231	Multinational Region Jason Ford M: +1 226-220-3401	South Region Ersin Yalcin M: +1 404-435-4722	West Region Madison McLaughlin M: +1 351-990-2888	Kasey Shaw Australia M: +61 7 3173 1714
HSE Programs Professional Andrew Thomas M: +1 508-649-3254	Canada Dean Zapishny M: +1 519-494-3031	Central Region Tony Schwegmann M: +1 309-634-5276	Kristoffer Lindo Europe M:+46 708 68 70 23	GEOSYNTEC FAMILY OF COMPANIES HSE Health, Safety, and Environment

Geosyntec consultants

Geosyntec HSE Procedures referenced herein are available on Geosyntec's HSE SharePoint site and should be consulted, as appropriate, to ensure requirements are met. This THA has been prepared per "*HSE STD-105, Project Safety Management Handbook*"

TASK HAZARD ANALYSIS

(Ver. 4.0, 9-8-2023)

Part A – PROJECT/TASK INFORMATION

Project/Site Name:	Camas Mill – Remedial Investigation	**Project Number/Org:**	AS130290L/02B
Site Address:	401 NE Adams Street, Camas, WA 98607		
Task & Worksite Description:	Geosyntec will conduct surface and subsurface investigation activities at an active paper production facility. Sonic drilling will be used to retrieve continuous core samples, which will be field screened for visual, olfactory, and instrumental indicators of contamination. Targeted soil sampling will be conducted in static, accessible areas with a history of industrial activity. Soil sampling in these targeted areas will include surface sampling, shallow sampling, test pit sampling, and deeper sampling within former wastewater ditches.		
Geosyntec Personnel:	**Name**	**Office Phone**	**Cell Phone**
Site Safety Lead/Officer Task Technical Lead	Erin Dunbar	(971) 271-5916	(971) 469-3080
Project Manager	Cindy Bartlett	(971) 271-5895	(503) 505-4145
Project Director	Tim Flynn	(206) 780-7730	(206) 276-5540
Local HSE Coordinator	Madeline Solimano	(206) 499-6773	(206) 499-6773
Regional HSE Manager	Madison McLaughlin	+1 (858) 716-2900	--
Corporate HSE Director	Bob Poll	(813) 379-4420	(813) 240-9231
On-Site Subcontractor(s): ☐ Not Applicable	☐ Applicable; provide company name, work task and contact information for each Geosyntec subcontractor below:		
	Drillers (TBD) Utility Locators (TBD)		
Client, Contact(s):	Matt Tiller, director of remediation services	(404) 652-5243	(404) 216-6674
ETHICS POINT HOTLINE	US & Canada: 844-231-3371 UK: 800-89-0011 or 800-89-0011	Australia: 800-551-155 or 800.811.011 Ireland: 800-222-55288 or 800-500-000	

Part B - EMERGENCY RESPONSE and FIRST AID

IMPORTANT: After initial emergency response actions and incident stabilization, contact appropriate project staff and/or HSE personnel listed in Part A

Site-Specific Notes, Clarifications: On-site areas where facility operations have ceased ("static" areas) are generally considered accessible for purposes of field activities. Areas where facility operations continue and therefore conditions may continue to change due to ongoing operations ("dynamic" areas) are generally considered inaccessible for purposes of field activities. Developments in accessibility (e.g., condition change from dynamic to static) and sampling results will be discussed with Ecology, and field activities will be evaluated accordingly.

Emergency Communication / Alerting	☒ Verbal ☒ Cell Phone ☐ Land Line ☐ 2-Way Radio ☐ Satellite Phone ☒ On-site alarm/signal system ☐ Other:
To Summon Police, Fire, Ambulance	☒ **DIAL 911**, for external responders ☐ **Other**:
WorkCare *(for non-emergency injuries)*	**24/7: 888-449-7787**
Other Emergency Contacts *(such as security, spill responder, utility-related):*	N/A
Nearest EMERGENCY ROOM Medical Services	Hospital Name: Peace Health Southwest Medical Center Address: 400 NE Mother Joseph Place, Vancouver, WA 98664 Phone #: (360) 729-8370 ☒ **See ATTACHMENT A, ROUTE to HOSPITAL**
Emergency Evacuation - Route, Rally/Muster Point, Shelter Location(s)	Muster point shall be determined each day during the safety tailgate meetings given dynamic site conditions.

EMERGENCY and FIRST AID EQUIPMENT required for this work task is listed in **PART C.2. – SAFETY EQUIPMENT LIST**

Attachment Hospital A: Route to Hospital

PART C – HAZARD ANALYSIS and EQUIPMENT LIST *(Basis for Field Team Safety Orientations and On-site Safety Discussions)*

C.1 ON-SITE TASK HAZARD ANALYSIS

INSTRUCTIONS:

- Begin your job safety analysis by reviewing **"Pointers"** (see lower right) and completing ***Part D "HAZARD ANALYSIS AND CONTROLS*** for your TASK(s).
- In **Columns 1 & 2** (below), list/describe **TASKS & WORK ASPECTS** and the associated **HAZARDS & RISKS.**
- In **Column 3** summarize **CONTROLS & SAFE WORK PRACTICES** (Brief summary descriptions with references to THA Sections).

ALWAYS "COLLAPSE" THESE INSTRUCTIONS IN COMPLETED THA!

REFERENCES - Copy and paste, as applicable, into **Column 3:**

See C.2. SAFETY EQUIPMENT LIST
See D.1. BASELINE HAZARD PREPAREDNESS
See D.2. SPECIAL TRAFFIC/VEHICLE/TRANSPORT HAZARDS
See D.3. WATER HAZARDS
See D.4. FALL HAZARDS
See D.5. HAND TOOLS
See D.6. POWERED TOOLS & EQUIPMENT
See D.7. DRILLING
See D.8. CONSTRUCTION, HEAVY/LIFT EQUIPMENT
See D.9. STORAGE OF BULK MATERIALS
See D.10. ELECTRICAL WORK TASKS
See D.11. UTILITY-RELATED HAZARDS
See D.12. CONFINED/ENCLOSED SPACES
See D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS
See D.14. COMMERCIAL CHEMICAL PRODUCTS
See D.15. SITE CONTAMINANTS, CHEMICAL WASTES
See D.16. RADIATION HAZARDS (Other than Sunlight)
See D.17. HAZMAT/DANGEROUS GOODS SHIPPING.
See Part E AIR MONITORING, EXPOSURE MONITORING
See ATTACHMENT "X"

For POINTERS on completing a HAZARD ANALYSIS, see <HERE>

1. TASKS/WORK ASPECTS	2. HAZARDS/RISKS	3. CONTROLS / SAFE WORK PRACTICES
Mobilization/Demobilization	• Routine work travel	See D.1. ROUTINE HAZARD PREPAREDNESS See D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS • Avoid cell phone use while driving • Obey all posted traffic signs and local laws • Demonstrate defensive driving • Plan route before beginning travel • Allow pedestrians the right-of-way • Familiarize with new area/site conditions
Prepare Work Area	• Slips Trips and Falls • Cuts / Abrasions • Struck By • Strains / Sprains	• Maintain good housekeeping practices and wear proper PPE.. • Setup work area away from active operations and high traffic areas. • Remove trip hazards in workspace. • Setup work area on a level surface. • Use caution when climbing in and out of truck bed, avoid jumping out of truck bed. • Wear cut resistant gloves while using cutting devices and unloading work supplies that may have pinch point or sharp edges, such as a sample table or work canopy. Inspect work area for sharp edges prior to setup. • Use proper lifting techniques. Use two people to lift objects greater than 50 pounds
Drill and install wells	• Concrete drilling and silica dust exposure • Noises	See C.2. SAFETY EQUIPMENT LIST See D.5. HAND TOOLS See D.6. POWERED TOOLS & EQUIPMENT

	• Heavy lifting • Heavy equipment • Overhead hazards • Underground Utilities	See D.7. DRILLING See D.8. CONSTRUCTION, HEAVY EQUIPMENT, LIFT EQUIPMENT See D.9. ELECTRICAL WORK TASKS See D.10. UTILITY-RELATED HAZARDS See D.14. COMMERCIAL CHEMICAL PRODUCTS See D.15. SITE CONTAMINANTS, CHEMICAL WASTES • Wear safety glasses, work gloves, steel toe boots during operation of pneumatic hammer drill • Wear hearing protection while drill rig is in operation • Use proper lifting techniques. Lift with legs, not back, and all equipment and supplies over 50 lbs. require two-person lift. • All locations will be cleared by public and private locates prior to drilling. • Stay clear of all heavy equipment and machinery.
Soil Sampling	• Proximity to operation and movement of drill rig. • Contaminants of concern - volatile organic compounds and total petroleum hydrocarbons in soil.	• Wear Modified Level D PPE when handling soil. • Maintain awareness of moving drill rig as it moves to drilling locations. Wear high visibility clothing.

4. ON-SITE CHANGES, UNFORSEEN HAZARDS, THA "ADJUSTMENTS" (Recognized During Mobilization/Execution of Field Work)

Date:	Notes:
Date:	Notes:

C.2. SAFETY EQUIPMENT LIST (Gear to be brought to the worksite by Geosyntec personnel, or availability at the worksite confirmed)

Site-Specific Notes, Clarifications: Project is occurring during business hours at an active dry cleaner (clothes drop off only, no cleaning) and pizza restaurant. Will need to be mindful and/or block off work area from customers or employees during drilling or hammering.				
☒	**WEATHER, CLIMATE, SEASONAL**	☐ Project-provided drinking water ☐ Canopy for shade, weather protection	☒ Sunscreen ☐ Ice creepers (boot attachments)	☐ Rock salt, traction sand ☐ Portable heater (electric or kerosene)
		☐ Other:		
☐	**HYGIENE PROVISIONS**	☐ Hand washing equipment (soap & wash water)	☐ Hand sanitizer, disinfectant supplies	☐ Sanitary facility, porta-toilet
		☐ Other:		
☒	**BASIC PPE**	☒ Standard work clothes appropriate for task ☒ Hard-toed boots/shoes ☒ Hardhat (as needed)	☒ Safety glasses ☒ Work gloves appropriate for task ☒ Noise/hearing protection (as needed)	☒ High-visibility/reflective vest/apparel ☒ Nuisance dust mask (voluntary use)
☐	**BIOLOGICAL HAZARDS**	☐ Insect/tick repellant--DEET, picaridin, other ☐ Permethrin-treated work clothing ☐ Pant-leg "blousing"/gaiters (tick safe) ☐ Tick removal kit ☐ Wasp/hornet spray, insect fogging device, other ☐ Poison ivy protection (Ivy Block skin cream, Tecnu skin wash)	☐ Animal warning device (for bears/cougars/wolves/large animals) ☐ Snake chaps/gaiters, bite/scratch-resistant gloves, other protective gear for animal hazards ☐ Hand sanitizer, hand washing supplies, personal hygiene supplies for infectious hazard control ☐ Disinfectant solution and related supplies to mitigate source of infectious hazard ☐ Masks, face covers, gloves, barriers, related gear to mitigate infectious hazard transmission	
		☐ Other:		
☐	**SPECIAL HAZARD CONTROLS**	☐ Portable GFCI(s) for shock protection ☐ Electrical-hazard-rated boots, gloves ☐ Arc-resistant (AR) protection PPE for arc flash ☐ Flame-resistant (FR) clothing ☐ Work-area delineation supplies	☐ Lockout/tagout equipment ☐ Portable lighting ☐ Tripod/winch ☐ Ventilation equipment (fan, blower) ☐ Traffic control devices	☐ Personal fall protection apparatus ☐ Personal flotation device ☐ Ring buoy & rope ☐ Marine survival suit
		☐ Other:		
☐	**CHEMICAL PPE and CHEMICAL SAFETY GEAR**	☐ Goggles and/or face shield ☐ Chemical protective gloves ☐ Coveralls (Tyvek, or other) ☐ Outer boots, boot covers	☐ Disposable N95 respirator ☐ Half-face respirator (APR), cartridges ☐ Full-face respirator (APR), cartridges ☐ Exclusion Zone delineation supplies	☐ Decon solution, related supplies ☐ Receptacle for disposable PPE ☐ **Chemical hazard emergency gear – listed in "EMERGENCY EQUIPMENT" below**
		☐ Air monitoring equipment, worker exposure monitoring device(s):		
		☐ Other:		
☒	**EMERGENCY EQUIPMENT**	☐ **Air horn, alarm, alerting equipment** ☐ **2-Way radios; other communication device** ☒ **First aid kit(s) – on-site and/or in vehicles** ☒ **Fire extinguisher – on-site and/or in vehicles**	☐ **Eyewash bottle(s)** ☐ **15-min. eyewash station** ☐ **Emergency deluge shower** ☐ **Chemical spill kit/supplies**	**Vehicle emergency preparedness:** ☒ **Fire extinguisher, first aid kit** ☐ **Flares, lights, reflective device** ☐ **Roadside assistance service**
		Other:		

PART D – HAZARD ANALYSIS AND CONTROLS (Site-Specific Safety Analysis & Information)

D.1. "BASELINE" HAZARD PREPAREDNESS (This section applicable to ALL Tasks, covering natural hazards, driving/travel, basic safety & PPE)

a. Weather/Climate/Altitude Hazards

☒ **Heat stress** – Prevent heat-related illness; At ambient temps > 80ºF (27ºC) **use Geo HeatTracker to assess hazard**, implement mitigations accordingly.

☒ **Cold stress** – Prevent frostbite, hypothermia; multiple clothing layers, keep clothing dry, protect exposed skin, stay hydrated, frequent warming breaks.

☐ **Sunburn, conjunctivitis** – Sun blocker, shade canopy, wide-brimmed hat, long sleeves/pants; protect eyes from glare near water/snow/sand

☐ **Extreme weather** – Track weather, emergency plan: ID shelter/refuge, use weather app for lightning prediction at 10 mi./16 Km (use "30/30 rule" as backup).

☐ **Weather-related conditions** – Use appropriate precautions for ice/snow/slippery conditions, flood, mold, soft ground, downed trees/wires, fire hazards, other.

☐ **Acute Mountain Sickness (AMS)/Altitude Illness** – for work to be performed at ≥ 8,000 feet (2,450 meters) above sea level, see *THA Addendum on AMS.*

Site-Specific Notes:

HSE Program Documents, *HSE SOP-409: Heat Illness Prevention*, *HSE SOP-410: Cold Stress Prevention*

b. Biological Hazards

☒ **Insect/tick/arthropod hazards/vector-borne disease** – Use insect repellant, permethrin-treated clothing/gear, tick checks, tuck pants/shirt, tick removal tool, wasp spray, bug zapper/trap, mosquito netting, fogging, other barriers and protective devices, habitat treatment/removal, as applicable.

☒ **Plant hazards** – Know the hazards (e.g. poison ivy/oak/sumac, giant hogweed, poison hemlock, nettles, etc.), know the precautions for site habitat: barrier ointments, washes; long sleeves/pants, gloves, remove plants (avoid burning), launder work clothes (hot water/detergent), clean tools (alcohol or soap/water).

☐ **Animal hazards** – Know the hazards/precautions for work site: avoidance, repellants, PPE, warning devices, habitat/food source removal, infection controls.

☐ **Common unsanitary/allergenic hazards** – Use routine hygienic measures/precautions; hand washing/sanitizer, food hygiene, PPE, disinfectant cleaning.

☐ **Infectious/pathogenic** - For site-specific infectious hazards (viral, bacterial, bloodborne pathogens, mold, other), see **D.13 "Infectious/Pathogenic Biohazards."**

Site-Specific Notes:

HSE Program Documents: *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants*,

c. Routine Driving Hazards

☒ **Routine work travel** – Use routine safe/defensive driving practices (seat belts, safe speeds, eyes ahead, no tailgating, limit distractions, safe cell phone use, no texting, clear windows, account for weather/road conditions, adequate sleep, other measures as appropriate).

☒ **Unfamiliar location** – Before driving in roadway: view map, note key benchmark locations, plot your route and/or enter destination into navigation device.

☒ **Unfamiliar vehicle** – Before driving in roadway: become familiar with vehicle controls; adjust seat, mirrors, vents, heat/AC, audio, lights, check brakes.

☐ **Fatigue** – Minimize fatigue during long drives: frequent rest breaks, muscle stretches, eat light snacks-avoid heavy meals, stay hydrated, fresh air, no loud music, clean windshield; avoid/minimize long distance driving during your ordinary sleep hours; total *work time* and *drive time* should not exceed 14 hours per day.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-220: Fatigue Management*, *HSE SOP-605a: Driver Authorization Program*

d. General Safety

☒ **General premises hazards** – Prevent slips/trips/falls (resulting from rough terrain, trip hazards, steep slope, slippery surfaces); maintain good housekeeping, be aware of on-site structures, utilities, overhead hazards, uneven/hazardous surfaces, obstacles, on-site traffic, restricted access/workspace.

☒ **Musculoskeletal hazards** – Prevent strains/sprains from strenuous tasks, overexertion, repetitive motion/ergonomic/lifting (seek help/lift-aids over 49 lbs.)

☒ **Worksite traffic hazards** – Implement measures to protect personnel (high-visibility/reflective clothing, on-person lighting, traffic control measures).

☐ **Hazardous energy** – Use caution near electrical equipment/wet locations, machinery/physical hazards, stay out of hazard zone/line-of-fire, don't touch.

☐ **Illumination hazards** – Illuminate work areas and/or access routes, use high-visibility and reflective clothing or on-person lighting, as appropriate.

☐ **Security: high potential for crime/workplace violence/security breach** – Complete a *Risk Assessment for Working in High-Crime, High Security Risk Locations*

☐ **Working alone –** Communicate a project-specific lone-work plan to coworkers, including procedures for periodic communication/contact.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*, *HSE SOP-210: General Housekeeping*, *HSE SOP-401: Lone Working*, *HSE SOP-403: Management of Traffic*, *HSE SOP-616: General Safety Rules*

e. Basic Personal Protection

☒ **Head protection from overhead hazards** – Wear hardhat or "bump cap" as appropriate for hazard.
☒ **Hand protection** – Wear gloves to protect from physical, chemical and biological hazards; select glove type (or types) specific for the task & hazard(s)
☒ **Eye protection** – Wear safety glasses (with side shield or wrap around, either clear or shaded for sun protection), or other appropriate eye protection.
☒ **Foot protection, rough terrain** – Wear work boots/shoes with hard toes, ankle support, puncture resistance, traction, as appropriate for conditions.
☒ **Hearing protection** – use earplugs or earmuffs (or both) as appropriate for conditions; at a minimum where noise levels exceed 85 dBA.
☒ **Protective clothing/nuisance dust mask** – For general protection against dust, dirt, oily residues, unsanitary conditions, as needed.
☐ **Other personal protective gear** for task(s) covered in this THA is described in respective sections of this THA in Site-Specific Notes & Clarifications

Site-Specific Notes:

HSE Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-135: Hearing Protection Program*

D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

(For water-transportation hazards, see D.3. "Water Hazards"; For construction traffic hazards, see D.8. "Construction, Heavy Equipment, Lift Equipment")

Site-Specific Notes & Clarifications: Routine driving.

☒	**THOROUGHFARE TRAFFIC HAZARDS** Where the worksite is located in/near vehicle thoroughfare (road, highway, parking lot, etc.). Hazards: Injury to worker and general public from collision involving moving vehicle.	☐ Prepare Management of Traffic (MOT) Plan (address location hazards / client and regulatory requirements). ☒ Wear DOT-approved reflective vests where exposed to traffic hazards. ☒ Where possible, park vehicles as protective shield from oncoming traffic. ☒ Configure work area and support vehicles to minimize worker exposure to traffic hazards. ☐ Use DOT signal devices and/or signage to re-route vehicles around work area, site entrances/exits. ☐ Use DOT-trained flaggers or police detail where appropriate or required. ***HSE Program Documents:*** *HSE SOP-403: Management of Traffic*
☐	**SPECIAL VEHICLE HAZARDS** Off-Road Driving or use of non-typical vehicle, heavy vehicle, work truck, van, UTV/ATV Hazards: Worker injury due to vehicle collision, rollover	☐ For off-road driving, do not exceed capability of vehicle, beware of wet conditions, keep speed low, avoid unsafe orientation on slopes. ☐ UTV/ATV-specific procedures for training, use roll-bar or helmet, operate per manufacturer's instructions. ☐ Special Skills Required for Vehicle type – For vehicles requiring special skills (such as windowless van, heavy work vehicle, utility vehicle, similar) ensure operator is provided training and/or has appropriate operator skills through experience. ***HSE Program Documents:*** *HSE SOP-652a-Utility Vehicles (US-only) (safe operation of mobile equipment)*
☐	**TOWING/HAULING LOADS** Hazards: Vehicle accident, occupant injury from shifting load, unsafe equipment, un-roadworthiness of trailer and/or vehicle.	☐ Ensure load within vehicle is firmly secured (rope, straps, load configuration) to prevent shifting during travel. ☐ Slings, chains, strap, rope and related equipment used for towing, hauling, load-securing shall be appropriate for use, and used in a manner as to prevent an unsafe condition (generally, bungee cords not appropriate). ☐ For trailer use, verify tow-hitch components are compatible, hitch/safety chains secure, signal/braking lights operational, rear-view mirrors effective, tires inflated to proper pressure and tread acceptable.
☐	**RAILROAD RIGHT-OF-WAY HAZARD** Hazards: Struck by train in R.R. right-of-way; electrical shock from third rail or overhead electrical lines	☐ Coordinate with rail company or on-site host facility and implement required safety and security measures. ☐ Site workers shall receive safety training/certification (per railroad owner/operator) for railroad work.
☐	**AIRPORT HAZARDS** (on the ground) Hazard: Injury due to proximity on/near airport runway, flight path.	☐ Coordinate safety requirements with airport personnel and implement required safety measures. ☐ Site workers shall receive safety training/certification (per airport owner/operator) for airport work. ***HSE Program Documents:*** *HSE SOP 628: General Aviation (Small Aircraft) Safety*
☐	**LIGHT AIRCRAFT/HELICOPTER USE** Hazards: Injury from collision during taxi/take-off/landing, aircraft crash and related general aviation hazards	☐ Review certifications/licenses/experience of pilot, airworthiness certificate for aircraft, safety practices of operator, aircraft safety rating, safety equipment/provisions on aircraft. ☐ Passengers shall adhere to general passenger safety practices, and requirements of owner/operator/pilot. ☐ For transport of HazMat/Dangerous Goods, see **D.17., "Transport/Shipping of Hazmat/Dangerous Goods"** ***HSE Program Documents:*** *HSE SOP-628-General Aviation, Small Aircraft Safety*
☐	**USE OF AERIAL "DRONE"** Hazards: Airspace interference, collision with ground personnel, general public, infrastructure.	☐ For use of aerial drone--a.k.a. *small unmanned aerial system* (sUAS), *remote piloted aircraft* (RPA) or *unmanned aerial vehicle* (UAV)--review/adhere to requirements for regulatory certifications, authorizations & approvals, and pre-mob planning for pre-flight-, in-flight-, and post-flight checks, and unplanned events. **HSE Program Documents:** HSE MAN-003a: Unmanned Aerial Systems Manual (U.S. Only)

D.3. WATER HAZARDS (Working Over/On/Near Water, Ash Ponds, Quicksand, Soft Ground) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.4. FALL HAZARDS (Falls to Lower Levels) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.5. HAND TOOLS (Manual, Hand-Powered) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Wear appropriate working gloves during tools handling.

☒	**MANUAL HAND TOOL INJURIES** ☒ Struck by ☒ Pinch points/crushing injuries ☒ Puncture ☒ Cutting blade/laceration risk ☒ Flying objects, eye hazards ☐ Other, describe above	☒ Proper tool for the job, maintain in good condition, use vise/clamp to hold work piece, proper follow through, Self and nearby personnel shall stay clear of "line of fire," use appropriate work gloves, keep blades sharp, use wrist strap when dropped tool poses a hazard. ☒ Utility/folding/collapsible knives and fixed-blade knives/cutting tools are *not* permitted, unless specifically authorized. Cutting tools with auto-retracting blades, or with enclosed/guarded blades are permitted. Use cut-resistant heavy work gloves, as applicable. ☒ Ground surface penetration (hand auger, probe) – requires utility clearance; see **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-640: Manual Hand Tools*
☒	MUSCULOSKELETAL (MSK) HAZARDS ☒ Risk of acute physical MSK trauma (strains, sprains, soft tissue injuries) ☒ Risk of cumulative/chronic MSK trauma, repetitive motion injuries	☒ For tools requiring high exertion (shovel, hand auger, sledgehammer, pickaxe, slide hammer, similar): do stretching exercises to prepare, clear hazard zone, use stable body position, take rest breaks, avoid overexertion. ☒ For recognized musculoskeletal hazard, acute or chronic, resulting from unsafe acute exertion, or ergonomic/repetitive motion/cumulative trauma risks, seek advice on controls **from Corporate HSE Dept**. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.6. POWERED TOOLS & EQUIPMENT (For Drilling & Heavy Equipment, see D.7 & D.8) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☒	**Type of powered tools/equipment:** ☐ "Power tools" ☒ Powered portable equipment ☐ Powered fixed equipment **Energy/power source:** ☒ DC battery- or solar-powered ☐ AC electric-powered ☐ 120V ☐ 240V ☐ 480V ☐ Extension/flexible cords ☐ Fuel-powered (gas or liquid) ☐ Pneumatic ☐ Hydraulic ☐ Gunpowder-actuated **Hazards of Power Tools and Powered Equipment:** ☒ Eye/hand/body injury ☒ Point-of-operation hazards ☒ Pinch points, moving parts ☐ Line-of-fire hazards, struck by ☐ Fire/explosion, ignition sources ☐ Burns from hot surfaces, steam ☒ Noise ☐ Inhalation/atmospheric hazards ☐ Working at heights, falls ☐ Overhead obstruction(s) ☐ Musculoskeletal hazards ☐ Potential (stored) energy ☐ Illumination	☒ General safe work practices for operation of powered tools and equipment: • Inspect before each use to ensure safe operating condition. • Clear personnel from hazard zone; keep personnel out of the "line-of-fire;" heed warning labels/signage. • Arrange worksite for safe access to equipment and sufficient work area clearance for safe use of tool; confirm no overhead obstructions; ensure adequate illumination. • Secure long hair/loose clothing/hanging jewelry near moving/rotating parts. • Ensure point-of-operation, mechanical power transmission, other moving parts are guarded with protective devices (as applicable); do not override interlocks, guards, protective devices. • Do not make any equipment modifications that create a greater hazard or bypass safety design features. • Use tool/equipment in accordance with manufacturer's use and safety instructions. • Use PPE and/or other safety protections, as appropriate, for eye/hearing/hand/head/body protection. • Provide training or verify operator competency for use of power tool/equipment. • Use ventilation, wet methods, respirators, other applicable means to mitigate inhalation hazard. • Move power cords/pressurized hoses to protect from damage during tool/equipment use. • For spark/heat generating tool/equipment, have fire extinguisher available, remove combustible/flammable materials, or use other means to control fire hazard (e.g. fire watch, fireproof blanket). • Use safe lifting practices and/or lift aids for moving heavy portable equipment, and use safe operating procedures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. • Implement safe work practices for compressed air, pressurized systems (pneumatic/hydraulic), stored energy. ☒ Additional requirements for power tools: • Use vise/clamp/work bench or other means to hold/secure a portable/moveable work piece. • Don't carry electrical tools/equipment by the power cord; don't carry pneumatic tools by hoses. • Disconnect tool/equipment from power source before changing bits, blades or making adjustments. ☐ Additional requirements for fixed powered equipment: • Implement lockout/tagout controls for repairs/adjustments/tooling changes. • Equip pneumatic hoses with whip checks; ensure factory fittings are used for high-pressure hose connections. ☐ For climbing/fall hazards associated with large equipment, see **D.4. "Fall Hazards."** ☐ For electrical hazards, see **D.10. "Electrical Work Tasks."** ☐ For ground surface penetration, see **D.11. "Utility-Related Hazards."** ☐ For fuel-safety practices, see **D.14. "Commercial Chemical Products."** ☐ For air monitoring of atmospheric hazards, see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**WELDING, CUTTING, HOT WORK** ☐ Arc-welding (electrical arc) ☐ Gas-welding/cutting (fuel gases) Hazards: - UV/IR light-eye/skin burns - hot-work hazards/fire - toxic metal welding fumes - compressed gases (physical hazards, fire, oxygen deficiency) - electrical shock	☐ General safe work practices for operators of welding equipment: • Hot work permit system shall be implemented. • Operator properly protected (eye protection, clothing, apron, etc.). • Fire hazard controls (watcher, fire extinguisher, water, remove combustibles from work area). • Protect nearby personnel from hazardous UV, IR light (shielding, curtain); see **D.16. "Radiation Hazards."** ☐ For welding gas cylinders, secure them upright with caps on when stored or not in use; protect cylinders from damage; NEVER secure gas cylinders to metal welding bench used for electrical arc welding; see **D.14. "Commercial Chemical Products."** ☐ For arc welding, follow electrical safe work practices; see **D.10. "Electrical Work Tasks."** ☐ For inhalation hazards from welding fumes (toxic metals) and gases (asphyxiant, flammable), see **D.14. "Commercial Chemical Products."**

☐	**PORTABLE ELECTRIC GENERATOR** Hazards: - Electrical shock - Carbon monoxide inhalation hazard - Fuel-related fire hazard - Injury from mechanical or lifting hazard - Burns from hot surfaces	☐ Follow general safe work practices for Powered Tools & Equipment (above), and as follows: • Use in accordance with manufacturer's instructions, including instructions for grounding the generator. • Keep generator and work area dry. • Never use indoors, or near building air intake vents due to carbon monoxide hazard. • Provide for ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Use hearing protection in close proximity to operating generator (where noise level exceeds 85 dBA). • Use power cords/extension cords specified by instructions. • Use ground-fault circuit interrupters (GFCIs) in accordance with manufacturer's instructions; see **D.10. "Electrical Work Tasks."** • Shut down equipment before refueling; see safe practices for flammable/combustible liquids in **D.14. "Commercial Chemical Products."**
☐	**PNEUMATIC / HYDRAULIC HAZARDS** ☐ Air compressor ☐ Compressed air system ☐ High-pressure liquid ☐ Pressurized steam (For compressed gas cylinders, see **D.14. "Commercial Chemical Products")**	☐ Never direct outlet nozzle toward body; use guards, restraints, engineering controls as appropriate. ☐ Never use compressed air for cleaning clothes you are wearing. ☐ If compressed air is used for cleaning, restrict pressure to 30 psi or below, equip nozzle with chip guard. ☐ Use PPE for eye (goggles or face shield)/hand/head/hearing/skin protection, as appropriate for the hazard. ☐ Ensure tank, hoses, fittings are in good repair using factory fittings, equipped with whip-checks. ☐ If pressure relief device poses a hazard to workers, reconfigure or shield device or restrict access by workers.
☐	**PORTABLE HEATER** ☐ electric ☐ fuel-powered Hazards: - Shock (electrical) - Carbon monoxide emissions and fuel-related fire hazards (fueled) - Fires/burns from hot surfaces.	☐ Follow general safety practices for Operation of Equipment/Machinery (above), and as follows: • Keep heater dry and locate heater on level surface away from high traffic areas to prevent tipping. • Never use fuel-powered heaters indoors, or near air intake vents, due to carbon monoxide hazard. • Provide ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Keep combustible materials at least 3 feet from hot surfaces. • Plug electric heaters directly into wall outlet (don't use extension cord or power strip). • For electric heaters, see **D.10., "Electrical Work Tasks."** • Shut down fuel-powered equipment before refueling; see safe practices for flammable/combustible liquids and/or compressed gases in **D.14. "Commercial Chemical Products."**
☐	**LOCKOUT/TAGOUT (LO/TO) OF HAZARDOUS ENERGY** To prevent unplanned equipment start-up or release of energy when under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-135: Hearing Protection Program, HSE STD-150: Globally Harmonized System for Hazard Communication (for fuel), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-452a: Lock-out/Tag-out (North America-only), HSE SOP-454a: General Electrical Safety (US-only), HSE SOP-642: Powered Hand Tools; HSE SOP-654: Welding, Cutting and Other Hot Work*		

D.7. DRILLING (Test Boring, Direct Push, Construction Drilling)

☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Sonic drilling will be used to retrieve continuous core samples.

☒	**DRILLING & DIRECT PUSH** Includes hazards posed by drilling rig and associated equipment, heavy support vehicles, trailer/towing hazards, and similar mobile equipment. Hazards: - Struck-by equipment - Run over, roll-over - Caught between (pinch points) - Manual lifting, musculoskeletal - Fuel/fluid leaks, fuel hazards - Suspended equipment - Roadway hazards	☒ Follow safe work practices, as applicable: • Non-drilling personnel shall stay clear of drilling work zone when drill rig in operation. • Equipment shall be maintained in good repair, inspected daily upon mobilization; backup alarms and emergency stop operational, machine guards in place, whip checks on high pressure lines. • Leaks or defective safety equipment will be repaired before use. • Establish eye contact with operator and use hand signals prior to approaching the rig. • Use PPE near operating rig (eye/head/hearing/hand/foot protection, high visibility vests or equivalent). • Arrange personal/support vehicles to protect drill team and not obstruct travel lanes or other operations. • Operators/helpers must maintain safe distance from moving parts; secure loose hair/clothing, equipment. • Drill rigs will only be moved with masts lowered. • Maximum safe slope for rig will be followed, drill rig leveled, appropriate blocking/cribbing as needed. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Ventilate exhaust and conduct air monitoring, as appropriate, when drilling indoors. • Never climb drill mast without appropriate fall protection. • Use precautions for overhead and underground utilities.
☒	**MECHANICAL LIFTING, RIGGING** Applies to lifting truck-mounted boom rig (e.g., drill rig), and all other drilling-related mechanical/electrical hoist equipment. Hazards: - Mechanical hazards - Elevated loads	☒ In addition to general drilling & direct push safety practices (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom, and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads.
☒	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☒ Follow safe work practices per **D.11. "Utility-Related Hazards."**

HSE Program Documents: *HSE SOP-430: Drilling Activities*, *SOP-434a: Overhead and Underground Utility Hazards (US-only)*, HSE SOP-644: Working Around Heavy Equipment,

D.8. CONSTRUCTION, HEAVY EQUIPMENT, LIFT EQUIPMENT

☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: The Site is considered active.

☒	**WORKING NEAR MOBILE HEAVY EQUIPMENT, ON-SITE VEHICLES** Hazards: - Struck-by - Caught between - Run over, roll over - Overhead hazards/obstructions - Elevated loads	☒ For personnel on-foot/on-the-ground near operating heavy equipment, follow safe work practices: • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Maintain unobstructed vision: wear shaded eyewear only in bright sun; don't wear hoods. • Erect barriers and post signs to identify and isolate the equipment hazard zone, if possible. • Stay out of swing radius of equipment, both in front and operating end, as well as at the back of equipment. • Stay out of the travel path of operating heavy equipment. • When crossing vehicle pathway behind moving equipment, cross at a distance not less than 30 feet. • When approaching equipment, always be able to see operator so he/she can see you. • Make eye contact with operator and use hand signals or make radio contact prior to approaching equipment. • Operator shall provide "all off" hand signal when it is safe to approach within swing radius of equipment.
☒	**OPERATION OF MOBILE HEAVY EQUIPMENT** Hazards: - Struck-by - Run over, roll over - Caught between (pinch points) - Fluid leaks/fuel-/fire-hazards - Overhead hazards/obstructions - Potential for body entrapment/crushing - Rotating equipment, moving parts.	☒ Operators shall follow safe work practices for operation of heavy equipment: • Only trained/qualified persons allowed to operate heavy equipment. • Wear seat belts; roll-over protection system present/deployed; do not exceed maximum safe slope. • No passengers on moving/operating equipment except where passenger seat/restraint is present. • Equipment inspected daily upon mobilization; maintained in good repair, backup alarms, windows clear. • Leaks or defective safety equipment should be repaired before use; fire extinguisher present. • Maintain eye contact with ground personnel and use hand signals to direct their approach near equipment. • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Cease operation if personnel enter swing radius, travel path or hazard zone of moving parts, elevated loads. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Equipment locked, secured, brakes set, buckets/forks lowered, extendable parts retracted, when not in use. • Shut down/lock out equipment to prevent crush situation beneath or between moving parts of equipment. • Ensure personal/support vehicles are parked/located to not obstruct equipment travel lanes/operating zones. • Mark temporary roadways clearly, provide berms/stops where needed. ***HSE Program Documents:*** HSE SOP-644: Working Around Heavy Equipment
☒	**TRENCHING/EXCAVATION** Hazards:	☒ Safe work practices when personnel enter trenches/excavations: • Activities under supervision/oversight of Competent Person, conduct daily inspection of excavation.

	- Cave-in, entrapment - Hazardous atmosphere - Water accumulation - Falls into excavations - Utility-related hazards - Undermining structures & foundations	• Excavated materials placed at least 2' from trench sidewall. • Prevent water accumulation in trench. • Sloping & shoring for trenches/excavations >20' deep must be approved by a Professional Engineer. • Sloping/shoring/trench box for excavations >5' when persons enter trench/excavation. • Sloping/shoring/trench box for shallow (<5') trench/excavation with cave-in hazard. • Workers in trenches shall be within 25 feet of ladder or sloped entryway. • Excavations shall be protected by perimeter fencing (not barricade tape), if potential for personnel to fall into. • If potential for atmospheric hazard, see **D.12. "Confined/Enclosed Spaces"** ***HSE Program Documents:*** HSE SOP-432: Excavation and Trenching Activities
☐	**FORKLIFT** Hazards: - Struck-by - Run over/roll over/tip over - Overhead utilities/obstructions - Caught between (pinch points) - Unstable/falling loads - Elevated forks - Fluid leaks	☐ In addition to general safety practices for heavy equipment (above), as applicable: • Qualified operator, per established forklift training (certificate is required); Geosyntec operator must be approved by Director of Health and Safety. • Equipment inspected daily and documented on Forklift Preoperational Inspection Checklist. • Do not exceed lifting load limits. • Forklift shall not be moved/driven with empty forks in raised position. • When not in use, forks lowered, brake set, controls in neutral, key removed. ***HSE Program Documents:*** HSE SOP-436: Safe Operation of Forklifts and Mobile Equipment
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - Falls from basket - Overhead utilities/obstructions - Struck-by, run over, tip over - Caught between (pinch points) - Tip over - Fluid leaks	☐ Follow safe work practices: • Operators shall be appropriately trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn when operating a boom lift (optional for scissor lift). • Overhead hazards and surface obstructions shall be reviewed with operators/riders prior to use. ***HSE Program Documents:*** HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)
☐	**CRANES** Hazards: – electrocution by overhead utility – injury in swing radius – injury from falling load – crane tipping over due to overbalancing, high winds, unstable ground, unsafe slope, bad placement of outriggers – injury from mechanical hazards	☐ In addition to general safety practices for Operation of Heavy Equipment (above), as applicable: • Only qualified persons operate cranes (certificate required). • Critical Lift Plan & Checklist prepared/executed (See Procedure) prior to mobilization. • Equipment shall be inspected prior to mobilization and daily by crane operator. • Crane operator will remain at the controls at all times during operation. • Crane operation must be performed under the direction of an appointed signal person at all times using hand signals and/or voice/radio communication. • Crane shall be level and stable (solid ground or crane mats/timbers, outriggers if present, cribbing); over-reaching or exceeding load limits is prohibited. • Keep area beneath suspended loads clear of personnel; tag lines used to maneuver load. • Rigging procedures – see Mechanical Lifts with Rigging, below.
☒	**MECHANICAL LIFTS WITH RIGGING** Applies to lifting by rigging attached to crane, truck-mounted boom rig (e.g. drill rig), heavy equipment, mechanical/electrical hoist, similar equipment. Hazards: – Mechanical hazards – Elevated loads	☒ In addition to general safety practices for Operation of Heavy Equipment and Cranes (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Coordinate lifting operations with competent person. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device (such as davit arm) are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads and that tag lines are used where appropriate.
☒	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☒ Follow safe work practices per **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*
☐	**DEMOLITION**	☐ Develop/implement a demolition safety plan.
☐	**BLASTING, UNEXPLODED ORDNANCE**	☐ Develop/implement safety plan for blasting, unexploded ordnance, as applicable. ***HSE Program Documents:*** *HSE SOP-622: Blasting & Use of Explosives*
☐	**PUBLIC AT RISK, SITE SECURITY**	☐ During site operations protect public (overhead protection, fencing, barriers, warning signs). ☐ During off hours, protect public with fencing, barriers, warning signs/lights, other measures as appropriate. ☐ Lock/secure hazardous materials and/or equipment.

D.9. STORAGE/HANDLING OF BULK MATERIALS (for *Chemical* Storage, see D.14 & 15) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.10. ELECTRICAL WORK TASKS

☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☒	**USE OF BATTERIES, BATTERY-POWERED EQUIPMENT <50 V, OR OTHER DC EQUIPMENT < 50 V** Potential fire hazard (if terminals are shorted), eye/skin hazards (when electrolyte is replenished), inhalation hazard in enclosed spaces.	☒ Follow safe work practices to control hazards of voltage, shock, arcing, overheating, hazardous gases, irritant electrolytes, secondary hazards. ☒ Prevent short-circuiting of terminals when battery is in use (segregated from tools, metal objects) and during transport (use battery transport container or install guard/cover on positive terminal). ☒ For batteries requiring replenishment of electrolyte, use PPE for eye and skin protection, and have eyewash equipment at hand; see discussion of *acids/caustics/corrosives* in **D.14. "Commercial Chemical Products."**
☒	**"NORMAL OPERATION" OF ELECTRICAL EQUIPMENT CONNECTED TO AC OR DC POWER SOURCE ≥ 50 V:** Electrically powered tools, equipment, machinery, extension cords, portable generators, working near electrical equipment. Hazards: – Electrical shock – Fire Hazard – Secondary hazards (falls, other injuries).	☒ Follow "normal operation" requirements: • All electrical enclosures/guards/covers must be in place/closed/secured. • Electrical equipment maintained per codes/standards/manufacturer's recommendations. • Ensure no indication of damage or impending failure (heat, smoke, buzzing, odors, arcing, melting). • Operate equipment in accordance with manufacturer's standard operating procedures. ☐ Follow general electrical safety work practices to minimize shock hazard and secondary hazards: • Control water-related/wet-location hazards in a manner appropriate for the job tasks/equipment/tool. • Never touch electrical equipment if you are wet or standing/kneeling in water or on wet surfaces. • Use extension cords/power cords properly, rated for use conditions and current draw, prevent damage. • Inspect tool/equipment/extension cords/power cords before each use; remove from use if damaged. • Use GFCI-protected outlet or portable GFCI in wet/moist locations, outdoors, basements, concrete floors. • Do not enter any space delineated by an electrical approach boundary.
☐	**HANDS-ON DIAGNOSTICS/REPAIR ON CIRCUIT(S) CONNECTED TO POWER SOURCE < 50 V:** ☐ AC ☐ DC ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Stray voltage from soil electrodes	☐ Implement electrical safe work practices pertaining to: • Workers trained appropriately for the task. • Shock prevention measures. • Eye/skin protection for arcing hazards. • Protection from secondary hazards.
☐	**WORK WITHIN *"APPROACH BOUNDARY"* OF EXPOSED, ENERGIZED (OR POTENTIALLY ENERGIZED) CONDUCTORS AND/OR CIRCUIT PARTS CONNECTED TO POWER SOURCE 50-600 V*:** ☐ AC ☐ DC ☐ 3-phase ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Induced voltage ☐ Stray voltage ≥50V from soil electrodes *** Working on >600 V not permitted for Geosyntec personnel**	☐ Prepare project-specific written "Electrical Safety Program" addressing (at a minimum): • Workers trained/designated as "Qualified Electrical Workers" per NFPA 70E (US)/CSA Z462 (CAN) • Assess risks of electrical shock (voltage levels and sources), arc flash hazard and secondary hazards. • Affix electrical hazard warning label to electrical enclosure(s) to be accessed. • Physically delineate arc flash- or limited approach boundary, whichever is farthest from hazard source. • Only "qualified" workers allowed within approach boundaries; prevent entry by non-qualified personnel. • Establish electrically safe working condition; work on live circuits prohibited (except for diagnostic testing). • Use PPE for shock/arc flash protection, as required. • Use other safe procedures/equipment required for the task, such as lockout/tagout.
☐	**LOCKOUT/TAGOUT (LO/TO) OF ELECTRICAL ENERGY** To prevent unplanned start-up or release of energy when equipment is under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**

HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only), HSE SOP-452a: Lock-out/Tag-out (North America-only) HSE SOP-454a: General Electrical Safety (US-only)*

D.11. UTILITY-RELATED HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Both a public utility locate ticket was submitted and a private locator will locate the immediate sub slab sampling areas.

☒	**OVERHEAD, ABOVE-GROUND UTILITIES**	☒ Do not cross approach boundaries with personnel or equipment; employ other appropriate precautions for the conditions (specify above). ☒ Use additional controls, as applicable: shielding, flagging, observer/monitor, or, ☒ Arrange for power company/utility owner to de-energize power line.
☒	**UNDERGROUND UTILITIES**	☒ Confirm appropriate underground utility clearance procedures have been completed prior to ground penetrations, and employ other utility clearance/locator practices, as appropriate for conditions. ☐ Hand digging/augering or vacuum post-holing within 3' of utility locations or other high-risk condition.

HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.12. CONFINED / ENCLOSED SPACES (Including Hazardous Indoor Spaces) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS ☐ Applicable ☒ Not Applicable, Not Anticipated

D.14. COMMERCIAL CHEMICAL PRODUCTS (per HAZCOM or WHMIS) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**PRODUCTS REGULATED BY HAZCOM[1] (US) or WHMIS[2] (CAN)**	☐ Safety Data Sheets (SDSs) available, either on site or readily available within same work shift, containers labelled properly, workers trained/oriented on hazards. ☐ For subcontractor/contractor use of chemical products, confirm SDS availability for affected on-site workers.
	[1] OSHA Hazard Communication Standard (United States); [2] Workplace Hazardous Material Information System (Canada)	
☒	**GENERAL SAFE WORK PRACTICES FOR FIELD USE OF CHEMICALS**	☒ Consult SDS for HSE hazards, symptoms of exposure; ensure workers have been apprised of safe practices. ☒ Handle with care, maintain good housekeeping, provide adequate illumination in work area. ☐ Pour/dispense/transfer liquid chemicals on stable work surface. ☐ Use chemicals in well-ventilated area; use fans/blowers/exhaust for active ventilation, as appropriate. ☐ Have eyewash bottles, eyewash station, deluge capabilities, commensurate for the hazard, readily available. ☐ Have spill/neutralization equipment, appropriate for the chemicals, readily available. ☐ Conduct air monitoring as appropriate; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**STORAGE/TRANSPORT OF CHEMICALS/HAZMAT** ☐ **Non-Emergency (Routine) Chemical Storage** Risk of personal contact and/or incidental release ☐ **HAZMAT Transport** ☐ **Risk of Emergency Spill/Release** ☐ **CFTAS (Chemical Facility Anti-Terrorism Standards) Applicability:** On-site overnight storage of non-waste chemical product at quantity ≥25 gal(115L) or ≥250 lbs. (115 kg)	☐ Transport chemicals only in sealed containers, secured to prevent shifting/breakage during travel. ☐ Store chemicals only in sealed containers; overnight storage in squirt/spray bottles prohibited. ☐ Store flammable/combustible liquids in chemical storage cabinets, or other appropriate storage arrangement. ☐ For liquids, provide secondary containment during storage. ☐ Segregate incompatible chemicals during storage. ☐ For *incidental release/spill;* maintain spill kit suitable for low flammability/toxicity/quantity/volatility release. ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/ Transportation.** ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate emergency response contact in Part B, "Emergency Response and First Aid." ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable. ☐ For CFTAS-applicable chemical storage, a safety and chemical management plan must be prepared and reviewed by an HSE Professional before bringing material to the site. (Does not apply to materials brought on to the site for daily work purposes and transported away at the end of each day)
☐	**COMPRESSED GAS CYLINDERS** ☐ Flammable ☐ Non-flammable ☐ Toxic ☐ Asphyxiant ☐ Oxygen	☐ Secure cylinders upright, caps on when not in use. ☐ Handle with care; use and store cylinders in a manner and location to prevent damage. ☐ Propane cylinders not in use must be stored outdoors in a cage or similar secure ventilated enclosure. ☐ Ensure acetylene cylinders are NOT secured to steel arc welding bench. ☐ Segregate oxygen and fuel gases by distance (20') or fire-rated barrier. ☐ Control ignition sources. ☐ "No smoking" signage at cylinder storage area for flammable gases.
☐	**FLAMMABLE/COMBUSTIBLE LIQUIDS**	☐ Use proper fuel safety can (metal fuel container with self-closing spout and flame arrestor preferred). ☐ Control/remove ignition sources near storage and use areas. ☐ Grounding and bonding where appropriate. ☐ Ensure a Type B or ABC fire extinguisher is readily available.
☐	**ACIDS, CAUSTICS, OTHER CORROSIVES**	☐ Use appropriate protection for eyes/face (goggles/face shield) and skin (gloves, sleeves, apron). ☐ Use eyewash, deluge shower, drench hose, hand washing (with water), as appropriate. ☐ For severe eye hazards (due to high corrosivity, large quantity), 15-min. eyewash required.
☐	**TOXIC**	☐ For toxic substances, use/store in a manner to control exposure hazards (inhalation, ingestion, skin contact, skin absorption); use active ventilation and/or PPE as appropriate.

☐	**EMISSIONS FROM FUEL COMBUSTION, HOT PROCESSES** ☐ Gasoline ☐ Diesel ☐ Propane/Natural Gas ☐ Welding/cutting/hot work ☐ Vehicle/equipment exhaust ☐ Other	☐ Position outdoor personnel upwind of exhaust source. ☐ Avoid "idling" of equipment when not in use. ☐ Use *passive ventilation* (air infiltration/air currents) to disperse atmospheric hazards in breathing zone. ☐ Use *dilution ventilation* (blowers/fans) to provide fresh air to work area and dissipate atmospheric hazards. ☐ Use *exhaust ventilation* (hood/duct/exhaust stack/blower) to capture/divert exhaust from work area. ☐ Use respiratory protection for high levels of smoke, exhaust particulates, soot. ☐ Conduct air monitoring as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
☐	**OTHER HAZARDS**	☐ Describe other hazardous substances and safety measures under "Site-Specific Notes & Clarifications," above.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-460: Field Site Exposure Monitoring*

D.15. SITE CONTAMINANTS, CHEMICAL WASTES

☒ **Applicable** ☐ **Not Applicable, Not Anticipated**

Site-Specific Notes & Clarifications: Investigation derived wastes including soil drill cuttings, decontamination water, development water, purged groundwater, and groundwater sampling tubing will be containerized in labeled 55-gallon steel drums and stored on-site.

CHECK ALL THAT APPLY. Provide site-specific notes/clarifications above.

☒ Soil/groundwater contaminants (historical release)	☐ Explosive dust	☐ Potential for flammable gas (methane)
☐ Recent release, known high concentrations	☐ Oxygen deficiency	☐ Corrosive, acids/caustics, strong irritants
☐ Former chemical disposal site, landfill	☒ Chlorinated volatile organic compounds (VOCs)	☐ Asbestos abatement work
☐ Urban fill, residual contaminants	☒ BTEX, petroleum-derived VOCs	☐ Pesticides, herbicides, fungicides
☒ Containerized waste (drums, process equipment)	☒ Fuel oils, petroleum, waste oil, lubricants	☐ Sensitizers
☐ Buried drums (known or potential)	☐ Metals, metal compounds, metal dusts	☐ Radioactive contaminants
☐ Large containers, potential for spills	☐ Elemental mercury	☐ Controlled substances, drugs
☐ Contaminated building surfaces	☐ Polyaromatic hydrocarbons (PAHs)	☐ Wildfire smoke, see *HSE SOP 470a Protection from Wildfire Smoke Exposure*
☐ Unexploded ordnance	☐ Potential for flammable vapors	☒ Other - describe above

NOTE: For sites with one or more **"high-risk contaminants"** (below) designated/recognized as a *contaminant of concern*, or *exceeding an environmental reporting threshold*, or representing a *potential exceedance of an action level or exposure limit*, the THA must be reviewed by the HSE Dept. before initiating the work:

☐ Asbestos	☐ Chromium VI (hexavalent chromium)	☐ Lead
☐ Arsenic/arsenic compounds	☒ Crystalline Silica (airborne)	☐ Methylene chloride
☐ Benzene	☐ Dioxins	☐ Polychlorinated biphenyls (PCBs)
☐ Beryllium	☐ Mercury	☐ Vinyl chloride
☐ Cadmium	☐ Hydrogen Cyanide (HCN)	

☐ **FOR WORK CONSISTING OF CLEANUP OPERATIONS, CORRECTIVE ACTIONS, PRELIMINARY INVESTIGATIONS at an "UNCONTROLLED HAZ. WASTE SITE" (per HAZWOPER, 29 CFR 1910.120 or equivalent), delineate procedures in "Site-Specific Notes and Clarifications" (or attachments) addressing the following, as applicable to the work:**

- Workers attend **pre-work orientation** on hazards, risks, on-site safety measures, and emergency contingencies.
- Implement **site control plan** - delineate Exclusion Zone(s), Contaminant Reduction Zone(s), Support Zone (aka EZ, CRZ, SZ).
- Include **site map/figure** depicting work locations and other relevant site-specific information.
- Site workers in EZ or CRZ shall have **40-hour HAZWOPER training**, current 8-hour refresher, 3 days supervised field experience.
- Site supervisor(s) shall have **8-hour Supervisor training**.
- Site workers in EZ or CRZ shall participate in **medical monitoring** program, as applicable.
- Implement **site-specific procedures** for worker protection via engineering controls, work practices, personal protective equipment (PPE), air monitoring, decontamination procedures, spill containment, emergency preparedness and response.
- Conduct **air monitoring**, as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
- **PPE program: Specify Levels of Protection** and specific PPE to be used for applicable tasks;
  - **Level D**: No respirator, no chemical protective clothing, standard work clothes, basic PPE; (COVID-19 face covers allowed)
  - **Modified Level D**: No respirator, chemical protective clothing as appropriate; (COVID-19 face covers allowed)
  - **Level C**: Air-purifying respirator, chemical protective clothing as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level B**: Air-supplied respirator, chemical protective clothing/suit as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level A**: Fully encapsulating suit, self-contained breathing apparatus (SCBA); **Level A prohibited for Geosyntec personnel.**

☒ **FOR SITE WITH CHEMICAL CONTAMINANTS OR WASTE BUT NOT REGULATED BY HAZWOPER**

- Workers shall be knowledgeable/aware of chemical hazards thru safety training/orientation and availability of hazard information.
- Implement controls to minimize worker exposure through engineering controls, work practices, PPE, decon, as appropriate.
- Evaluate worker exposure via air monitoring/sampling, as applicable; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**

☐	**STORAGE/TRANSPORT OF IDW*** **Spill/Release Risk:** ☐ Risk of *incidental spill/release*	☐ Describe site-specific procedures above for spill containment, container handling, as applicable. ☐ For liquids, provide secondary containment during storage. ☐ Segregate incompatible chemicals during storage.

	☐ Risk of *emergency spill/release* ** Investigation-Derived Waste*	☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable. ☐ For *incidental spills*; spill kit on-site for low-hazard releases (low-flammability/toxicity/quantity/volatility) ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate Emergency response contact in Part B, "Emergency Response and First Aid." ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/Transportation."**
☐	**OFF-SITE MIGRATION OF AIRBORNE CONTAMINANTS**	☐ Implement controls to minimize hazard migration (dust suppression, covers, foam, etc.). ☐ Community/perimeter air monitoring will be conducted per perimeter air monitoring plan; see **E.3 "Fence Line/Perimeter Air Monitoring."**
HSE Program Documents: *HSE STD-120: Occupational Medical Management Program, HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-301a: Contaminated Site Investigation & Remediation (US-only), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-634: Drum Sampling, HSE SOP-636: Handling of Uncharacterized Hazardous Waste Containers , HSE SOP 470a Protection from Wildfire Smoke Exposure*		

D.16. RADIATION HAZARDS (Other than Sunlight) ☐ **Applicable** ☒ **Not Applicable, Not Anticipated**

D.17. SHIPPING/TRANSPORTATION HAZMAT/DANGEROUS GOODS ☐ **Applicable** ☒ **Not Applicable, Not Anticipated**

PART E – AIR MONITORING, WORKER EXPOSURE MONITORING

E.1. AIR MONITORING ☐ **Applicable** ☒ **Not Applicable, Not Anticipated**

E.2. OTHER WORKER EXPOSURE MONITORING / SAMPLING ☐ **Applicable** ☒ **Not Applicable, Not Anticipated**

E.3. FENCELINE / PERIMETER AIR MONITORING ☐ **Applicable** ☒ **Not Applicable, Not Anticipated**

PART F – APPROVALS, ACKNOWLEDGEMENTS

F.1. THA PREPARATION, REVIEW/APPROVAL SIGNATURES A THA is typically prepared by project staff, often with input from an HSC, with review/approval, at a minimum, by PM and/or Field Lead. Corporate HSE staff must be consulted as required or otherwise deemed appropriate*.

	Printed Name	***Signature***	***Date***
PREPARER(S)	Jensen Perrick		7/1/2025
	Madeline Solimano		7/2/2025
THA REVIEWED/ APPROVED BY: (Project Manager or PM-Designee, at a minimum)**	***Printed Name***	***Signature***	***Date***

* At a minimum, Corp. HSE **must** review/approve the THA review when Geosyntec staff will encounter "high hazards/high risks," or perform critical tasks, such as (but not limited to):

- Work at heights >10', use personal fall apparatus
- Work at height near overhead electrical utility lines
- Operate a UTV/ATV, aerial lift or fork-lift
- Tow a trailer on roadway
- Oversee a hot-work permit system
- Enter a hazardous confined/enclosed space
- Use of unmanned aerial vehicle (drone)
- High-risk ergonomic/musculoskeletal hazard
- Implement lockout/tagout controls
- Enter a trench/excavation >5' deep
- Function as a construction "Competent Person"
- Operate a pneumatic or powder-actuated tool
- "Qualified" Electrical testing & maintenance >50 V
- High risk, non-typical infectious/pathogenic hazard
- Derive action levels for VOCs or toxic dusts
- Instrument monitoring for critical exposure risks
- Wear a respirator
- Presence of "high-risk" contaminant(s)
- Sustained exposure to wildfire smoke $AQI_{PM\ 2.5}$ >150
- Exposure to radioactive isotopes (α, β, γ)
- High-risk exposure to: non-ionizing (microwave, EMF, UV, IR) or ionizing (radio-isotope, x-ray) radiation.
- On-site risk of emergency chemical spill
- Applicability of Chemical Anti-Terrorism Standards

Corporate HSE **must** also be consulted when Geosyntec subcontractors (*under Geosyntec's oversight*) perform high hazard/high risk work (such as demolition, blasting, crane critical lifts, confined space entry, testing/maintenance of electrical systems, lockout/tagout, HAZWOPER cleanup activities). Consultation with Corp. HSE is encouraged for all questions/concerns regarding worker safety, regulatory compliance, risk/liability aspects, or project-specific safety requirements.

** It is recommended that THAs be approved/signed by both the PM *and* Field Lead (or alternate PM designee), unless due to small scope/scale or routine nature of task, or staff unavailability, only one approval is deemed sufficient by PM. Additional review and approval will be performed by Corp. HSE for high-hazard/high-risk tasks, or as otherwise requested.

HSE Program Documents: *For more information, see "HSE STD-105, Project Safety Management Handbook".*

F.2. GEOSYNTEC FIELD CREW ACKNOWLEDGEMENTS

Please sign below to acknowledge you reviewed and understand this THA, participated in project safety briefing and had an opportunity to ask questions about the information herein.

Printed Name	Signature	Employee No.	Date

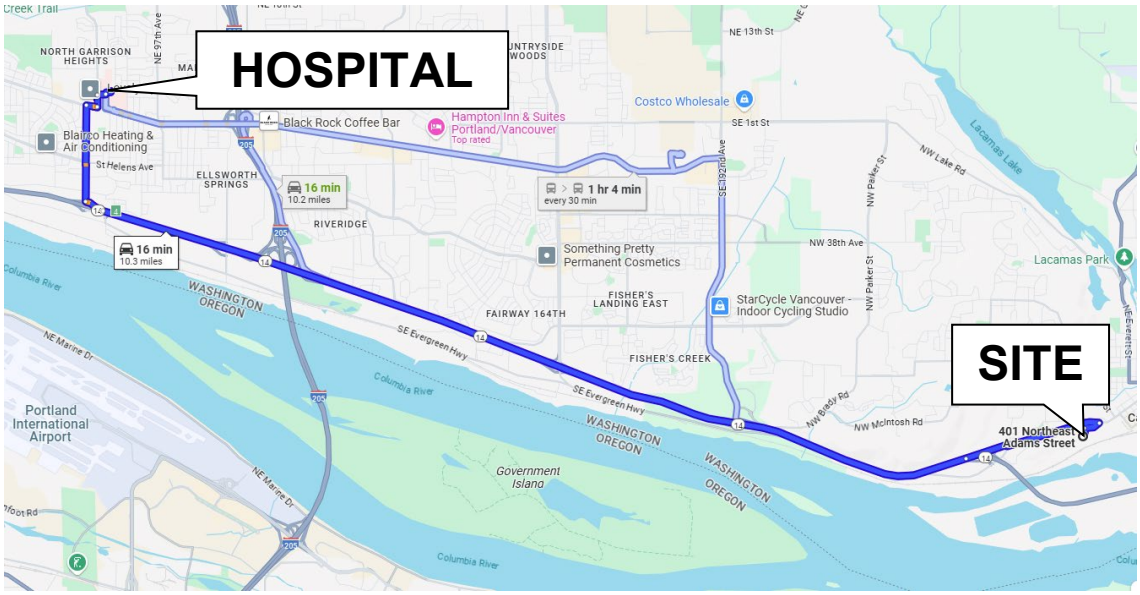
F.3. SUBCONTRACTOR'S FIELD CREW ACKNOWLEDGEMENTS ☐ Applicable ☐ Not Applicable

Please sign below to acknowledge this THA was made available to you, and you had an opportunity to ask questions about the information herein.

Printed Name	Signature	Company Name	Date

ATTACHMENTS:

Attachment A – Route to Hospital



Hospital Name: Peace Health Southwest Medical Center
Address: 400 NE Mother Joseph Place
Phone Number: (360) 729-8370

Directions To Hospital From Site:
Get on WA-14 from NW 6th Avenue (4 min, 1.4 mi)

- Head north toward NW 6th Avenue (371 ft)
- Turn right (0.1 mi)
- Turn left onto NW 6th Avenue (0.8 mi)
- At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Follow WA-14 W to S Lieser Road in Vancouver. Take exit 4 from WA-14 W (8 min, 7.8 mi)

- Merge onto WA-14 W (7.6 mi)
- Take exit 4 for Lieser Road toward SE 88th Ave (0.2 mi)

Continue on S Lieser Road. Drive to NE Mother Joseph Place (4 min, 1.1 mi)

- Turn right onto S Lieser Road (0.8 mi)
- Turn right onto E Mill Plain Boulevard (489 ft)
- Use the 2nd from the left lane to turn left onto NW 87th Avenue (0.1 mi)
- Turn right toward NE Mother Joseph Place (367 ft)
- Turn left toward NE Mother Joseph Place (335 ft)

HSE Event Response and Notification

Geosyntec consultants

CHOOSE THE BEST PATH!

EMERGENCY EVENT (catastrophic occurrence, injury or illness requiring emergency medical care, etc.)

IMMEDIATELY CALL 911 or alternate emergency number for your locale*

Conduct First Responses (rescue/assist injured, stop work, evacuate, stabilize worksite, other**)

Meet Arriving Emergency Responders and apprise them of the situation (fire, ambulance, police, other)

Notify HSE TEAM ASAP by phone or EVENT NOTIFICATION TOOL

NOTIFY your Manager, Supervisor, Client, and other key contacts ASAP

COMPLETE full *Incident Report* within 24 hours (use link in followup email you'll receive after submitting an **EVENT NOTIFICATION**)

NON-EMERGENCY EVENT or NEAR MISS

Stabilize the situation and provide initial care/support**

Notify HSE Team using EVENT NOTIFICATION TOOL within 1 hour after injury/illness or vehicle accident; by end of workday for other events.

For injury/illness or vehicle accident, HSE will attempt call-back within 1 hour of EVENT NOTIFICATION

Proceed as Directed by HSE for Medical Triage* and other aspects**

GOOD CATCH (Observed unsafe condition or non-compliance, positive safety observation, improvement suggestion, etc.)

Submit a **Good Catch** using the EVENT NOTIFICATION TOOL (on same day of occurrence)

IMPORTANT: To load the **EVENT NOTIFICATION TOOL** onto your mobile device, scan this QR code:

* 911 in North America; 112 in EU; 999 & 112 both applicable in UK; 000 in Australia; for other country- or site-specific numbers, see your Written Safety Plan or Office Emergency Plan

** First response actions by site/project team should always be in accordance with general-duty obligations, on-site roles, and training qualifications

*** Employees may initiate a call for medical triage/support if no call-back received from HSE within 60 minutes of Event Notification, or if HSE is not available directly by phone. For the medical support contact in your location (*WorkCare in North America; location-specific elsewhere*) see your Written Safety Plan or Office Emergency Plan, as applicable

If you have questions or concerns about any workplace health and safety matter, please contact a member of your Corporate HSE Team for assistance:

Global HSE Director
Bob Poll
M: +1 813-240-9231

HSE Programs Professional
Andrew Thomas
M: +1 508-649-3254

Multinational Region
Jason Ford
M: +1 226-220-3401

Canada
Dean Zapishny
M: +1 519-494-3031

South Region
Ersin Yalcin
M: +1 404-435-4722

Central Region
Tony Schwegmann
M: +1 309-634-5276

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Madison McLaughlin
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GEOSYNTEC FAMILY OF COMPANIES
HSE
Health, Safety, and Environment

Geosyntec consultants

Geosyntec HSE Procedures referenced herein are available on Geosyntec's HSE SharePoint site and should be consulted, as appropriate, to ensure requirements are met. This THA has been prepared per "*HSE STD-105, Project Safety Management Handbook*"

TASK HAZARD ANALYSIS

(Ver. 4.0, 9-8-2023)

Part A – PROJECT/TASK INFORMATION

Project/Site Name:	Camas Mill – Remedial Investigation	**Project Number/Org:**	AS130290L/02B
Site Address:	401 NE Adams Street, Camas, WA 98607		
Task & Worksite Description:	Geosyntec will conduct surface and subsurface investigation activities at an active paper production facility.		
Geosyntec Personnel:	**Name**	**Office Phone**	**Cell Phone**
Site Safety Lead/Officer Task Technical Lead	Erin Dunbar	(971) 271-5916	(971) 469-3080
Project Manager	Cindy Bartlett	(971) 271-5895	(503) 505-4145
Project Director	Tim Flynn	(206) 780-7730	(206) 276-5540
Local HSE Coordinator	Madeline Solimano	(206) 499-6773	(206) 499-6773
Regional HSE Manager	Madison McLaughlin	+1 (858) 716-2900	--
Corporate HSE Director	Bob Poll	(813) 379-4420	(813) 240-9231
On-Site Subcontractor(s): ☒ Not Applicable	☐ Applicable; provide company name, work task and contact information for each Geosyntec subcontractor below:		
Client, Contact(s):	Matt Tiller, director of remediation services	(404) 652-5243	(404) 216-6674
ETHICS POINT HOTLINE	US & Canada: 844-231-3371 UK: 800-89-0011 or 800-89-0011	Australia: 800-551-155 or 800.811.011 Ireland: 800-222-55288 or 800-500-000	

Part B - EMERGENCY RESPONSE and FIRST AID

IMPORTANT: After initial emergency response actions and incident stabilization, contact appropriate project staff and/or HSE personnel listed in Part A

Site-Specific Notes, Clarifications: On-site areas where facility operations have ceased ("static" areas) are generally considered accessible for purposes of field activities. Areas where facility operations continue and therefore conditions may continue to change due to ongoing operations ("dynamic" areas) are generally considered inaccessible for purposes of field activities. Developments in accessibility (e.g., condition change from dynamic to static) and sampling results will be discussed with Ecology, and field activities will be evaluated accordingly.

Emergency Communication / Alerting	☒ Verbal ☒ Cell Phone ☐ Land Line ☐ 2-Way Radio ☐ Satellite Phone ☒ On-site alarm/signal system ☐ Other:
To Summon Police, Fire, Ambulance	☒ **DIAL 911**, for external responders ☐ **Other**:
WorkCare *(for non-emergency injuries)*	**24/7: 888-449-7787**
Other Emergency Contacts *(such as security, spill responder, utility-related):*	N/A
Nearest EMERGENCY ROOM Medical Services	Hospital Name: Peace Health Southwest Medical Center Address: 400 NE Mother Joseph Place, Vancouver, WA 98664 Phone #: (360) 729-8370 ☒ **See ATTACHMENT A, ROUTE to HOSPITAL**
Emergency Evacuation - Route, Rally/Muster Point, Shelter Location(s)	Muster point shall be determined each day during the safety tailgate meetings given dynamic site conditions.

EMERGENCY and FIRST AID EQUIPMENT required for this work task is listed in **PART C.2. – SAFETY EQUIPMENT LIST**

Attachment Hospital A: Route to Hospital

PART C – HAZARD ANALYSIS and EQUIPMENT LIST *(Basis for Field Team Safety Orientations and Onsite Safety Discussions)*

C.1 ONSITE TASK HAZARD ANALYSIS

INSTRUCTIONS:

- Begin your job safety analysis by reviewing **"Pointers"** (see lower right) and completing ***Part D "HAZARD ANALYSIS AND CONTROLS*** for your TASK(s).
- In **Columns 1 & 2** (below), list/describe **TASKS & WORK ASPECTS** and the associated **HAZARDS & RISKS.**
- In **Column 3** summarize **CONTROLS & SAFE WORK PRACTICES** (Brief summary descriptions with references to THA Sections).

ALWAYS "COLLAPSE" THESE INSTRUCTIONS IN COMPLETED THA!

REFERENCES - Copy and paste, as applicable, into **Column 3:**

See C.2. SAFETY EQUIPMENT LIST
See D.1. BASELINE HAZARD PREPAREDNESS
See D.2. SPECIAL TRAFFIC/VEHICLE/TRANSPORT HAZARDS
See D.3. WATER HAZARDS
See D.4. FALL HAZARDS
See D.5. HAND TOOLS
See D.6. POWERED TOOLS & EQUIPMENT
See D.7. DRILLING
See D.8. CONSTRUCTION, HEAVY/LIFT EQUIPMENT
See D.9. STORAGE OF BULK MATERIALS
See D.10. ELECTRICAL WORK TASKS
See D.11. UTILITY-RELATED HAZARDS
See D.12. CONFINED/ENCLOSED SPACES
See D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS
See D.14. COMMERCIAL CHEMICAL PRODUCTS
See D.15. SITE CONTAMINANTS, CHEMICAL WASTES
See D.16. RADIATION HAZARDS (Other than Sunlight)
See D.17. HAZMAT/DANGEROUS GOODS SHIPPING.
See Part E AIR MONITORING, EXPOSURE MONITORING
See ATTACHMENT "X"

For POINTERS on completing a HAZARD ANALYSIS, see <HERE>

1. TASKS/WORK ASPECTS	2. HAZARDS/RISKS	3. CONTROLS / SAFE WORK PRACTICES
Mobilization/Demobilization	Routine work travel	See D.1. ROUTINE HAZARD PREPAREDNESS See D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS • Avoid cell phone use while driving • Obey all posted traffic signs and local laws • Demonstrate defensive driving • Plan route before beginning travel • Allow pedestrians the right-of-way • Familiarize with new area/site conditions
Premises Hazards	Driving hazards Active and changing site conditions Underground/overhead utilities	Take breaks to avoid heat illnesses and stay hydrated. See D.1. BASELINE HAZARD PREPAREDNESS
b. Premises Hazards	For example: - Driving hazards - Underground utilities	In addition to basic driving safety, limit speed to 5 mph (8 km/hr) while onsite; when exiting the site onto roadway, right turn only (no left turns across traffic). For all work, wear hard-toe work boots, proper work clothes, reflective/Hi-Viz vest, eye protection. Hearing protection near noise sources. Install vapor pins at appropriate clearance of underground utilities and hazards.
c. Task/Subtask Hazards		

sub slab vapor pin install	For example: - Power tool use - Dust reduction - Noise protection -	Keep cords away from drilling area and use the roto hammer properly and safely. Use shop vac while drilling to reduce airborne dust and mask during drilling. Wear ear plugs to reduce exposure to loud noise during drilling. Wear safety glasses during drilling to protect eyes from dust and debris
sub slab vapor sampling	For example: - Wear proper PPE - Lifting and squatting -	Wear safety glasses and gloves to protect from pump and equipment pieces. Be careful while squatting down to work area and while lifting equipment.

4. ONSITE CHANGES, UNFORSEEN HAZARDS, THA "ADJUSTMENTS" (Recognized During Mobilization/Execution of Field Work)

Date:	Notes:
Date:	Notes:

C.2. SAFETY EQUIPMENT LIST (Gear to be brought to the worksite by Geosyntec personnel, or availability at the worksite confirmed)

Site-Specific Notes, Clarifications: Project is occurring during business hours at an active dry cleaner (clothes drop off only, no cleaning) and pizza restaurant. Will need to be mindful and/or block off work area from customers or employees during drilling or hammering.

☒	**WEATHER, CLIMATE, SEASONAL**	☐ Project-provided drinking water ☐ Canopy for shade, weather protection	☒ Sunscreen ☐ Ice creepers (boot attachments)	☐ Rock salt, traction sand ☐ Portable heater (electric or kerosene)
		☐ Other:		
☐	**HYGIENE PROVISIONS**	☐ Hand washing equipment (soap & wash water)	☐ Hand sanitizer, disinfectant supplies	☐ Sanitary facility, porta-toilet
		☐ Other:		
☒	**BASIC PPE**	☒ Standard work clothes appropriate for task ☒ Hard-toed boots/shoes ☒ Hardhat (as needed)	☒ Safety glasses ☒ Work gloves appropriate for task ☒ Noise/hearing protection (as needed)	☒ High-visibility/reflective vest/apparel ☒ Nuisance dust mask (voluntary use)
☐	**BIOLOGICAL HAZARDS**	☐ Insect/tick repellant--DEET, picaridin, other ☐ Permethrin-treated work clothing ☐ Pant-leg "blousing"/gaiters (tick safe) ☐ Tick removal kit ☐ Wasp/hornet spray, insect fogging device, other ☐ Poison ivy protection (Ivy Block skin cream, Tecnu skin wash)	☐ Animal warning device (for bears/cougars/wolves/large animals) ☐ Snake chaps/gaiters, bite/scratch-resistant gloves, other protective gear for animal hazards ☐ Hand sanitizer, hand washing supplies, personal hygiene supplies for infectious hazard control ☐ Disinfectant solution and related supplies to mitigate source of infectious hazard ☐ Masks, face covers, gloves, barriers, related gear to mitigate infectious hazard transmission	
		☐ Other:		
☐	**SPECIAL HAZARD CONTROLS**	☐ Portable GFCI(s) for shock protection ☐ Electrical-hazard-rated boots, gloves ☐ Arc-resistant (AR) protection PPE for arc flash ☐ Flame-resistant (FR) clothing ☐ Work-area delineation supplies	☐ Lockout/tagout equipment ☐ Portable lighting ☐ Tripod/winch ☐ Ventilation equipment (fan, blower) ☐ Traffic control devices	☐ Personal fall protection apparatus ☐ Personal flotation device ☐ Ring buoy & rope ☐ Marine survival suit
		☐ Other:		
☐	**CHEMICAL PPE and CHEMICAL SAFETY GEAR**	☐ Goggles and/or face shield ☐ Chemical protective gloves ☐ Coveralls (Tyvek, or other) ☐ Outer boots, boot covers	☐ Disposable N95 respirator ☐ Half-face respirator (APR), cartridges ☐ Full-face respirator (APR), cartridges ☐ Exclusion Zone delineation supplies	☐ Decon solution, related supplies ☐ Receptacle for disposable PPE ☐ **Chemical hazard emergency gear – listed in "EMERGENCY EQUIPMENT" below**
		☐ Air monitoring equipment, worker exposure monitoring device(s):		
		☐ Other:		
☒	**EMERGENCY EQUIPMENT**	☐ **Air horn, alarm, alerting equipment** ☐ **2-Way radios; other communication device** ☒ **First aid kit(s) – onsite and/or in vehicles** ☒ **Fire extinguisher – onsite and/or in vehicles**	☐ **Eyewash bottle(s)** ☐ **15-min. eyewash station** ☐ **Emergency deluge shower** ☐ **Chemical spill kit/supplies**	**Vehicle emergency preparedness:** ☒ **Fire extinguisher, first aid kit** ☐ **Flares, lights, reflective device** ☐ **Roadside assistance service**
		Other:		

PART D – HAZARD ANALYSIS AND CONTROLS *(Site-Specific Safety Analysis & Information)*

D.1. "BASELINE" HAZARD PREPAREDNESS (This section applicable to ALL Tasks, covering natural hazards, driving/travel, basic safety & PPE)

a. Weather/Climate/Altitude Hazards

☒ **Heat stress** – Prevent heat-related illness; At ambient temps > 80ºF (27ºC) **use Geo HeatTracker to assess hazard**, implement mitigations accordingly.

☒ **Cold stress** – Prevent frostbite, hypothermia; multiple clothing layers, keep clothing dry, protect exposed skin, stay hydrated, frequent warming breaks.

☐ **Sunburn, conjunctivitis** – Sun blocker, shade canopy, wide-brimmed hat, long sleeves/pants; protect eyes from glare near water/snow/sand

☐ **Extreme weather** – Track weather, emergency plan: ID shelter/refuge, use weather app for lightning prediction at 10 mi./16 Km (use "30/30 rule" as backup).

☐ **Weather-related conditions** – Use appropriate precautions for ice/snow/slippery conditions, flood, mold, soft ground, downed trees/wires, fire hazards, other.

☐ **Acute Mountain Sickness (AMS)/Altitude Illness** – for work to be performed at ≥ 8,000 feet (2,450 meters) above sea level, see *THA Addendum on AMS.*

Site-Specific Notes:

HSE Program Documents, *HSE SOP-409: Heat Illness Prevention*, *HSE SOP-410: Cold Stress Prevention*

b. Biological Hazards

☒ **Insect/tick/arthropod hazards/vector-borne disease** – Use insect repellant, permethrin-treated clothing/gear, tick checks, tuck pants/shirt, tick removal tool, wasp spray, bug zapper/trap, mosquito netting, fogging, other barriers and protective devices, habitat treatment/removal, as applicable.

☒ **Plant hazards** – Know the hazards (e.g. poison ivy/oak/sumac, giant hogweed, poison hemlock, nettles, etc.), know the precautions for site habitat: barrier ointments, washes; long sleeves/pants, gloves, remove plants (avoid burning), launder work clothes (hot water/detergent), clean tools (alcohol or soap/water).

☐ **Animal hazards** – Know the hazards/precautions for work site: avoidance, repellants, PPE, warning devices, habitat/food source removal, infection controls.

☐ **Common unsanitary/allergenic hazards** – Use routine hygienic measures/precautions; hand washing/sanitizer, food hygiene, PPE, disinfectant cleaning.

☐ **Infectious/pathogenic** - For site-specific infectious hazards (viral, bacterial, bloodborne pathogens, mold, other), see **D.13 "Infectious/Pathogenic Biohazards."**

Site-Specific Notes:

HSE Program Documents: *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants*,

c. Routine Driving Hazards

☒ **Routine work travel** – Use routine safe/defensive driving practices (seat belts, safe speeds, eyes ahead, no tailgating, limit distractions, safe cell phone use, no texting, clear windows, account for weather/road conditions, adequate sleep, other measures as appropriate).

☒ **Unfamiliar location** – Before driving in roadway: view map, note key benchmark locations, plot your route and/or enter destination into navigation device.

☒ **Unfamiliar vehicle** – Before driving in roadway: become familiar with vehicle controls; adjust seat, mirrors, vents, heat/AC, audio, lights, check brakes.

☐ **Fatigue** – Minimize fatigue during long drives: frequent rest breaks, muscle stretches, eat light snacks-avoid heavy meals, stay hydrated, fresh air, no loud music, clean windshield; avoid/minimize long distance driving during your ordinary sleep hours; total *work time* and *drive time* should not exceed 14 hours per day.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-220: Fatigue Management*, *HSE SOP-605a: Driver Authorization Program*

d. General Safety

☒ **General premises hazards** – Prevent slips/trips/falls (resulting from rough terrain, trip hazards, steep slope, slippery surfaces); maintain good housekeeping, be aware of on-site structures, utilities, overhead hazards, uneven/hazardous surfaces, obstacles, onsite traffic, restricted access/workspace.

☒ **Musculoskeletal hazards** – Prevent strains/sprains from strenuous tasks, overexertion, repetitive motion/ergonomic/lifting (seek help/lift-aids over 49 lbs.)

☒ **Worksite traffic hazards** – Implement measures to protect personnel (high-visibility/reflective clothing, on-person lighting, traffic control measures).

☐ **Hazardous energy** – Use caution near electrical equipment/wet locations, machinery/physical hazards, stay out of hazard zone/line-of-fire, don't touch.

☐ **Illumination hazards** – Illuminate work areas and/or access routes, use high-visibility and reflective clothing or on-person lighting, as appropriate.

☐ **Security: high potential for crime/workplace violence/security breach** – Complete a *Risk Assessment for Working in High-Crime, High Security Risk Locations*

☐ **Working alone –** Communicate a project-specific lone-work plan to coworkers, including procedures for periodic communication/contact.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*, *HSE SOP-210: General Housekeeping*, *HSE SOP-401: Lone Working*, *HSE SOP-403: Management of Traffic*, *HSE SOP-616: General Safety Rules*

e. Basic Personal Protection

☒ **Head protection from overhead hazards** – Wear hardhat or "bump cap" as appropriate for hazard.
☒ **Hand protection** – Wear gloves to protect from physical, chemical and biological hazards; select glove type (or types) specific for the task & hazard(s)
☒ **Eye protection** – Wear safety glasses (with side shield or wrap around, either clear or shaded for sun protection), or other appropriate eye protection.
☒ **Foot protection, rough terrain** – Wear work boots/shoes with hard toes, ankle support, puncture resistance, traction, as appropriate for conditions.
☒ **Hearing protection** – use earplugs or earmuffs (or both) as appropriate for conditions; at a minimum where noise levels exceed 85 dBA.
☒ **Protective clothing/nuisance dust mask** – For general protection against dust, dirt, oily residues, unsanitary conditions, as needed.
☐ **Other personal protective gear** for task(s) covered in this THA is described in respective sections of this THA in Site-Specific Notes & Clarifications

Site-Specific Notes:

HSE Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-135: Hearing Protection Program*

D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

(For water-transportation hazards, see D.3. "Water Hazards"; For construction traffic hazards, see D.8. "Construction, Heavy Equipment, Lift Equipment")

Site-Specific Notes & Clarifications:

☒	**THOROUGHFARE TRAFFIC HAZARDS** Where the worksite is located in/near vehicle thoroughfare (road, highway, parking lot, etc.). Hazards: Injury to worker and general public from collision involving moving vehicle.	☐ Prepare Management of Traffic (MOT) Plan (address location hazards / client and regulatory requirements). ☒ Wear DOT-approved reflective vests where exposed to traffic hazards. ☒ Where possible, park vehicles as protective shield from oncoming traffic. ☒ Configure work area and support vehicles to minimize worker exposure to traffic hazards. ☐ Use DOT signal devices and/or signage to re-route vehicles around work area, site entrances/exits. ☐ Use DOT-trained flaggers or police detail where appropriate or required. ***HSE Program Documents:*** *HSE SOP-403: Management of Traffic*
☐	**SPECIAL VEHICLE HAZARDS** Off-Road Driving or use of non-typical vehicle, heavy vehicle, work truck, van, UTV/ATV Hazards: Worker injury due to vehicle collision, rollover	☐ For off-road driving, do not exceed capability of vehicle, beware of wet conditions, keep speed low, avoid unsafe orientation on slopes. ☐ UTV/ATV-specific procedures for training, use roll-bar or helmet, operate per manufacturer's instructions. ☐ Special Skills Required for Vehicle type – For vehicles requiring special skills (such as windowless van, heavy work vehicle, utility vehicle, similar) ensure operator is provided training and/or has appropriate operator skills through experience. ***HSE Program Documents:*** *HSE SOP-652a-Utility Vehicles (US-only) (safe operation of mobile equipment)*
☐	**TOWING/HAULING LOADS** Hazards: Vehicle accident, occupant injury from shifting load, unsafe equipment, un-roadworthiness of trailer and/or vehicle.	☐ Ensure load within vehicle is firmly secured (rope, straps, load configuration) to prevent shifting during travel. ☐ Slings, chains, strap, rope and related equipment used for towing, hauling, load-securing shall be appropriate for use, and used in a manner as to prevent an unsafe condition (generally, bungee cords not appropriate). ☐ For trailer use, verify tow-hitch components are compatible, hitch/safety chains secure, signal/braking lights operational, rear-view mirrors effective, tires inflated to proper pressure and tread acceptable.
☐	**RAILROAD RIGHT-OF-WAY HAZARD** Hazards: Struck by train in R.R. right-of-way; electrical shock from third rail or overhead electrical lines	☐ Coordinate with rail company or on-site host facility and implement required safety and security measures. ☐ Site workers shall receive safety training/certification (per railroad owner/operator) for railroad work.
☐	**AIRPORT HAZARDS** (on the ground) Hazard: Injury due to proximity on/near airport runway, flight path.	☐ Coordinate safety requirements with airport personnel and implement required safety measures. ☐ Site workers shall receive safety training/certification (per airport owner/operator) for airport work. ***HSE Program Documents:*** *HSE SOP 628: General Aviation (Small Aircraft) Safety*
☐	**LIGHT AIRCRAFT/HELICOPTER USE** Hazards: Injury from collision during taxi/take-off/landing, aircraft crash and related general aviation hazards	☐ Review certifications/licenses/experience of pilot, airworthiness certificate for aircraft, safety practices of operator, aircraft safety rating, safety equipment/provisions on aircraft. ☐ Passengers shall adhere to general passenger safety practices, and requirements of owner/operator/pilot. ☐ For transport of HazMat/Dangerous Goods, see **D.17., "Transport/Shipping of Hazmat/Dangerous Goods"** ***HSE Program Documents:*** *HSE SOP-628-General Aviation, Small Aircraft Safety*
☐	**USE OF AERIAL "DRONE"** Hazards: Airspace interference, collision with ground personnel, general public, infrastructure.	☐ For use of aerial drone--a.k.a. *small unmanned aerial system* (sUAS), *remote piloted aircraft* (RPA) or *unmanned aerial vehicle* (UAV)--review/adhere to requirements for regulatory certifications, authorizations & approvals, and pre-mob planning for pre-flight-, in-flight-, and post-flight checks, and unplanned events. **HSE Program Documents:** HSE MAN-003a: Unmanned Aerial Systems Manual (U.S. Only)

D.3. WATER HAZARDS (Working Over/On/Near Water, Ash Ponds, Quicksand, Soft Ground) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐ **WATER HAZARDS**

Work/travel in watercraft or on equipment over water or over coal ash impoundment/pond:
☐ Workboat, barge, over-water structures
☐ Water transportation
☐ Hazardous currents (river, tidal/riptide)
☐ Towing, trailer, roadway
☐ Other – describe above

Walking/wading into water, on shoreline, riverbank, dock, bulkhead, abutment, coal ash:
☐ Wading/walking into/near water, wetland
☐ Hazardous tidal zone or surf
☐ Water release, flash flood
☐ Coal ash pond, quicksand, soft ground
☐ Open culvert, arroyo, drainage/irrigation ditch
☐ Ice hazard on or near waterbody

Diving
☐ Scientific SCUBA diving

Hazards (as applicable):
- Drowning, cold immersion
- Boating collision, navigation, fog, darkness
- Fire/fuel hazards
- Entrapment (mud/silt/coal ash/quicksand)
- Slip/fall hazards – ice, mud, silt, wet surfaces
- Weather, heat/cold stress
- Equipment failure, hypoxia
- Chemical contaminant and/or biological hazard

General water-safety measures for all work near water:
☐ Wear regulatory-approved personal flotation device (PFD) where drowning hazard is present.
☐ Bring emergency rescue and/or signaling equipment (ring buoy and rope, reaching device, flares)
☐ For fall protection over water, see **D.4. "Fall Hazards."**
☐ For electrical hazards associated with water/wet locations, see **D.10. "Electrical Work Tasks."**

Boating-specific:
☐ Use fuel safety practices, fire extinguisher present in boat.
☐ Develop/follow float plan, monitor weather, navigate/communicate as planned.
☐ Confirm navigation/communication equipment operable before heading onto water.
☐ For work over very cold water, have immersion survival suit available.
☐ For tidal, flash flood, dam release hazards, plan/locate work accordingly.
☐ For towing a boat trailer, see **D.2. "Special Driving/Traffic/Transportation Hazards."**

Wading in water or walking along shore/bank or on dock/pier/abutment:
☐ For ice/slip hazards, wear ice creepers, sand work area, use tether, other appropriate measures.
☐ For work on ice over water, verify safe thickness, have ring buoy & rope available
☐ For unsure/slippery footing in water, use wading staff, high-traction soles on waders.
☐ Have lifesaving skiff/boat available in circumstances where other rescue means are inadequate.
☐ Monitor hazardous tides, weather for flash floods, know water release schedule.

For soft ground, ash ponds, quicksand:
☐ Wear personal flotation device (PFD), as appropriate for the work task and work environment.
☐ Bring emergency rescue equipment (ring buoy and rope, reaching device)
☐ If walking on ash/quicksand, provide stable walking/working surface (4'x8' plywood, or similar)

For diving:
☐ Develop a diving safety plan approved by Geosyntec's diving coordinator

For chemical contaminant and/or biological/infectious hazard:
☐ See **Section(s) D.1.b., "Biological Hazards**, **D.13., "Infectious/Allergenic Biohazards," D.14., "Commercial Chemical Products," and/or D.15., "Site Contaminants, Chemical Wastes"**

HSE Program Documents: *HSE SOP-407: Working On/Near Water and Ice, HSE SOP-630: Water Transportation Safety, HSE MAN-005: Underwater Diving Operations Manual*

D.4. FALL HAZARDS (Falls to Lower Levels) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐ **WORKING AT HEIGHTS (GENERAL)**

Hazards:
- Injury from falls onto lower surface or falls into hazardous equipment, chemicals, water
- Overhead utilities/obstructions
- Impalement hazard (such as from falling onto unprotected rebar and similar surface projections)
- Hazard posed to ground personnel from falling tools, equipment, materials

Fall protection "trigger heights":
Built environment *– US & CAN: 4 ft. (1.2 m.);* ***Construction:*** *US: 6 ft., 10 ft. for scaffolds; CAN: 10 ft. (3 m)*

Protect from ***primary*** (fall) hazards:
☐ Restrict access to hazard (barriers, tape, sign)
☐ Ensure safe access to height (ladder, stair, lift)
☐ Ensure guardrails/stair-rails/handrails present
☐ Ensure covers in place over holes
☐ Use designated "watch person/monitor"
☐ Use tether or positioning device
☐ Use personal fall apparatus (PFA)
☐ Use fall protection net

Protect from ***secondary*** (collateral) hazards:
☐ Protect site ground personnel from falling objects (restrict access, toe-boards, tether tools)
☐ Install caps on protruding rebar and similar
☐ Working over water; see **D.3, "Water Hazards"**
☐ Working over hazardous machinery/equipment; see **D.6, "Power-Tools/Powered Equipment"**
☐ Overhead electrical; See **D.11. "Utility-Related Hazards"**
☐ Working over chemical hazards; See **D.14 and/or D.15 for chemical and/or contaminant hazards.**

HSE Program Documents: *HSE SOP-405: Walking-Working Surfaces Protection, HSE SOP-415a: Fall Protection (North America-only), HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

☐ **LADDER / STAIRS**
☐ Extension/straight ladders
☐ Step ladders
☐ Fixed/installed ladders
☐ Portable/mobile stairs
☐ Job-made or scaffold stairs

Hazards:
- See general fall hazards, above.

☐ Follow safe work practices:
- Use ladders according to safe practices and manufacturer's instructions.
- Maintain 3 points of contact at all times on ladder; keep center of gravity within side rails.
- Do not use metal (conductive) ladder near electrical hazard.
- Extension/straight ladders shall be properly footed, secured, angled, extend above upper work surface.
- Stepladders are set on level ground or properly shimmed, spreaders locked; do not climb/stand on top step, top cap, or rear non-climbing side; use step ladder of sufficient reach height for work.
- Equip stairs with stair handrails where more than 4 steps, and for stairway height of 4' or more.
- Ensure portable stairs are stable, plumb, and of sufficient reach height for task.

HSE Program Documents: *HSE SOP-415a: Fall Protection (North America-only); HSE SOP-638: Ladders and Stairways*

☐	**SCAFFOLD** ☐ Supported scaffold ☐ Suspended scaffold ☐ Free-standing/mobile scaffold Hazards: - See general fall hazards, above - Equipment collapse	☐ Follow safe work practices: • Identify/coordinate operations with the scaffold "Competent Person." • Supported scaffold level, stable, proper attachments, tiebacks, planking, • Suspended scaffolds anchored properly. • Guardrails or personal fall apparatus required above 10 feet. • Proper means of accessing scaffold (proper ladders, stair tower); don't climb scaffold frames. • Total height of free-standing scaffold shall not exceed four times the minimum base dimension. • Don't exceed load limits, distribute loads evenly, stage materials in quantities sufficient for immediate use. ***HSE Program Documents:*** HSE SOP-648: Scaffolds
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - See general fall hazards, above - Struck-by, run-over, tip over - Caught between (pinch points) - Fluid leaks/fuel hazards or battery-related hazards	☐ Follow safe work practices: • Operators shall be trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn whenever operating a boom lift (optional for scissors lift). • Overhead hazards and surface obstructions shall be reviewed with operators prior to use. ***HSE Program Documents:*** *HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)*
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11., "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.5. HAND TOOLS (Manual, Hand-Powered) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Hammers will be used to install the sub slab vapor sampling equipment.

☐	**MANUAL HAND TOOL INJURIES** ☐ Struck by ☒ Pinch points/crushing injuries ☐ Puncture ☐ Cutting blade/laceration risk ☒ Flying objects, eye hazards ☐ Other, describe above	☒ Proper tool for the job, maintain in good condition, use vise/clamp to hold work piece, proper follow through, Self and nearby personnel shall stay clear of "line of fire," use appropriate work gloves, keep blades sharp, use wrist strap when dropped tool poses a hazard. ☒ Utility/folding/collapsible knives and fixed-blade knives/cutting tools are *not* permitted, unless specifically authorized. Cutting tools with auto-retracting blades, or with enclosed/guarded blades are permitted. Use cut-resistant heavy work gloves, as applicable. ☒ Ground surface penetration (hand auger, probe) – requires utility clearance; see **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-640: Manual Hand Tools*
☐	MUSCULOSKELETAL (MSK) HAZARDS ☐ Risk of acute physical MSK trauma (strains, sprains, soft tissue injuries) ☐ Risk of cumulative/chronic MSK trauma, repetitive motion injuries	☐ For tools requiring high exertion (shovel, hand auger, sledgehammer, pickaxe, slide hammer, similar): do stretching exercises to prepare, clear hazard zone, use stable body position, take rest breaks, avoid overexertion. ☐ For recognized musculoskeletal hazard, acute or chronic, resulting from unsafe acute exertion, or ergonomic/repetitive motion/cumulative trauma risks, seek advice on controls **from Corporate HSE Dept**. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.6. POWERED TOOLS & EQUIPMENT (For Drilling & Heavy Equipment, see D.7 & D.8) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**Type of powered tools/equipment:** ☒ "Power tools" ☐ Powered portable equipment ☐ Powered fixed equipment **Energy/power source:** ☐ DC battery- or solar-powered ☐ AC electric-powered ☐ 120V ☐ 240V ☐ 480V ☐ Extension/flexible cords ☐ Fuel-powered (gas or liquid) ☐ Pneumatic ☐ Hydraulic ☐ Gunpowder-actuated **Hazards of Power Tools and Powered Equipment:** ☒ Eye/hand/body injury ☒ Point-of-operation hazards ☒ Pinch points, moving parts	☒ General safe work practices for operation of powered tools and equipment: • Inspect before each use to ensure safe operating condition. • Clear personnel from hazard zone; keep personnel out of the "line-of-fire;" heed warning labels/signage. • Arrange worksite for safe access to equipment and sufficient work area clearance for safe use of tool; confirm no overhead obstructions; ensure adequate illumination. • Secure long hair/loose clothing/hanging jewelry near moving/rotating parts. • Ensure point-of-operation, mechanical power transmission, other moving parts are guarded with protective devices (as applicable); do not override interlocks, guards, protective devices. • Do not make any equipment modifications that create a greater hazard or bypass safety design features. • Use tool/equipment in accordance with manufacturer's use and safety instructions. • Use PPE and/or other safety protections, as appropriate, for eye/hearing/hand/head/body protection. • Provide training or verify operator competency for use of power tool/equipment. • Use ventilation, wet methods, respirators, other applicable means to mitigate inhalation hazard. • Move power cords/pressurized hoses to protect from damage during tool/equipment use. • For spark/heat generating tool/equipment, have fire extinguisher available, remove combustible/flammable materials, or use other means to control fire hazard (e.g., fire watch, fireproof blanket). • Use safe lifting practices and/or lift aids for moving heavy portable equipment, and use safe operating procedures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. • Implement safe work practices for compressed air, pressurized systems (pneumatic/hydraulic), stored energy. ☒ Additional requirements for power tools: • Use vise/clamp/work bench or other means to hold/secure a portable/moveable work piece. • Don't carry electrical tools/equipment by the power cord; don't carry pneumatic tools by hoses. • Disconnect tool/equipment from power source before changing bits, blades or making adjustments.

	☐ Line-of-fire hazards, struck by ☐ Fire/explosion, ignition sources ☐ Burns from hot surfaces, steam ☒ Noise ☒ Inhalation/atmospheric hazards ☐ Working at heights, falls ☐ Overhead obstruction(s) ☐ Musculoskeletal hazards ☐ Potential (stored) energy ☐ Illumination	☐ Additional requirements for fixed powered equipment: • Implement lockout/tagout controls for repairs/adjustments/tooling changes. • Equip pneumatic hoses with whip checks; ensure factory fittings are used for high-pressure hose connections. ☐ For climbing/fall hazards associated with large equipment, see **D.4. "Fall Hazards."** ☐ For electrical hazards, see **D.10. "Electrical Work Tasks."** ☐ For ground surface penetration, see **D.11. "Utility-Related Hazards."** ☐ For fuel-safety practices, see **D.14. "Commercial Chemical Products."** ☐ For air monitoring of atmospheric hazards, see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**WELDING, CUTTING, HOT WORK** ☐ Arc-welding (electrical arc) ☐ Gas-welding/cutting (fuel gases) Hazards: - UV/IR light-eye/skin burns - hot-work hazards/fire - toxic metal welding fumes - compressed gases (physical hazards, fire, oxygen deficiency) - electrical shock	☐ General safe work practices for operators of welding equipment: • Hot work permit system shall be implemented. • Operator properly protected (eye protection, clothing, apron, etc.). • Fire hazard controls (watcher, fire extinguisher, water, remove combustibles from work area). • Protect nearby personnel from hazardous UV, IR light (shielding, curtain); see **D.16. "Radiation Hazards."** ☐ For welding gas cylinders, secure them upright with caps on when stored or not in use; protect cylinders from damage; NEVER secure gas cylinders to metal welding bench used for electrical arc welding; see **D.14. "Commercial Chemical Products."** ☐ For arc welding, follow electrical safe work practices; see **D.10. "Electrical Work Tasks."** ☐ For inhalation hazards from welding fumes (toxic metals) and gases (asphyxiant, flammable), see **D.14. "Commercial Chemical Products."**
☐	**PORTABLE ELECTRIC GENERATOR** Hazards: - Electrical shock - Carbon monoxide inhalation hazard - Fuel-related fire hazard - Injury from mechanical or lifting hazard - Burns from hot surfaces	☐ Follow general safe work practices for Powered Tools & Equipment (above), and as follows: • Use in accordance with manufacturer's instructions, including instructions for grounding the generator. • Keep generator and work area dry. • Never use indoors, or near building air intake vents due to carbon monoxide hazard. • Provide for ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Use hearing protection in close proximity to operating generator (where noise level exceeds 85 dBA). • Use power cords/extension cords specified by instructions. • Use ground-fault circuit interrupters (GFCIs) in accordance with manufacturer's instructions; see **D.10. "Electrical Work Tasks."** • Shut down equipment before refueling; see safe practices for flammable/combustible liquids in **D.14. "Commercial Chemical Products."**
☐	**PNEUMATIC / HYDRAULIC HAZARDS** ☐ Air compressor ☐ Compressed air system ☐ High-pressure liquid ☐ Pressurized steam (For compressed gas cylinders, see **D.14. "Commercial Chemical Products")**	☐ Never direct outlet nozzle toward body; use guards, restraints, engineering controls as appropriate. ☐ Never use compressed air for cleaning clothes you are wearing. ☐ If compressed air is used for cleaning, restrict pressure to 30 psi or below, equip nozzle with chip guard. ☐ Use PPE for eye (goggles or face shield)/hand/head/hearing/skin protection, as appropriate for the hazard. ☐ Ensure tank, hoses, fittings are in good repair using factory fittings, equipped with whip-checks. ☐ If pressure relief device poses a hazard to workers, reconfigure or shield device or restrict access by workers.
☐	**PORTABLE HEATER** ☐ electric ☐ fuel-powered Hazards: - Shock (electrical) - Carbon monoxide emissions and fuel-related fire hazards (fueled) - Fires/burns from hot surfaces.	☐ Follow general safety practices for Operation of Equipment/Machinery (above), and as follows: • Keep heater dry and locate heater on level surface away from high traffic areas to prevent tipping. • Never use fuel-powered heaters indoors, or near air intake vents, due to carbon monoxide hazard. • Provide ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Keep combustible materials at least 3 feet from hot surfaces. • Plug electric heaters directly into wall outlet (don't use extension cord or power strip). • For electric heaters, see **D.10., "Electrical Work Tasks."** • Shut down fuel-powered equipment before refueling; see safe practices for flammable/combustible liquids and/or compressed gases in **D.14. "Commercial Chemical Products."**
☐	**LOCKOUT/TAGOUT (LO/TO) OF HAZARDOUS ENERGY** To prevent unplanned equipment start-up or release of energy when under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
	HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-135: Hearing Protection Program, HSE STD-150: Globally Harmonized System for Hazard Communication (for fuel), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-452a: Lock-out/Tag-out (North America-only), HSE SOP-454a: General Electrical Safety (US-only), HSE SOP-642: Powered Hand Tools; HSE SOP-654: Welding, Cutting and Other Hot Work*	

D.7. DRILLING (Test Boring, Direct Push, Construction Drilling) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**DRILLING & DIRECT PUSH** Includes hazards posed by drilling rig and associated equipment, heavy support vehicles, trailer/towing hazards, and similar mobile equipment. Hazards: - Struck-by equipment - Run over, roll-over - Caught between (pinch points) - Manual lifting, musculoskeletal - Fuel/fluid leaks, fuel hazards - Suspended equipment - Roadway hazards	☐ Follow safe work practices, as applicable: • Non-drilling personnel shall stay clear of drilling work zone when drill rig in operation. • Equipment shall be maintained in good repair, inspected daily upon mobilization; backup alarms and emergency stop operational, machine guards in place, whip checks on high pressure lines. • Leaks or defective safety equipment will be repaired before use. • Establish eye contact with operator and use hand signals prior to approaching the rig. • Use PPE near operating rig (eye/head/hearing/hand/foot protection, high visibility vests or equivalent). • Arrange personal/support vehicles to protect drill team and not obstruct travel lanes or other operations. • Operators/helpers must maintain safe distance from moving parts; secure loose hair/clothing, equipment. • Drill rigs will only be moved with masts lowered. • Maximum safe slope for rig will be followed, drill rig leveled, appropriate blocking/cribbing as needed. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Ventilate exhaust and conduct air monitoring, as appropriate, when drilling indoors. • Never climb drill mast without appropriate fall protection. • Use precautions for overhead and underground utilities.
☐	**MECHANICAL LIFTING, RIGGING** Applies to lifting truck-mounted boom rig (e.g., drill rig), and all other drilling-related mechanical/electrical hoist equipment. Hazards: - Mechanical hazards - Elevated loads	☐ In addition to general drilling & direct push safety practices (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom, and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-430: Drilling Activities, SOP-434a: Overhead and Underground Utility Hazards (US-only),* HSE SOP-644: Working Around Heavy Equipment,

D.8. CONSTRUCTION, HEAVY EQUIPMENT, LIFT EQUIPMENT ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**WORKING NEAR MOBILE HEAVY EQUIPMENT, ON-SITE VEHICLES** Hazards: - Struck-by - Caught between - Run over, roll over - Overhead hazards/obstructions - Elevated loads	☐ For personnel on-foot/on-the-ground near operating heavy equipment, follow safe work practices: • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Maintain unobstructed vision: wear shaded eyewear only in bright sun; don't wear hoods. • Erect barriers and post signs to identify and isolate the equipment hazard zone, if possible. • Stay out of swing radius of equipment, both in front and operating end, as well as at the back of equipment. • Stay out of the travel path of operating heavy equipment. • When crossing vehicle pathway behind moving equipment, cross at a distance not less than 30 feet. • When approaching equipment, always be able to see operator so he/she can see you. • Make eye contact with operator and use hand signals or make radio contact prior to approaching equipment. • Operator shall provide "all off" hand signal when it is safe to approach within swing radius of equipment.
☐	**OPERATION OF MOBILE HEAVY EQUIPMENT** Hazards: - Struck-by - Run over, roll over - Caught between (pinch points) - Fluid leaks/fuel-/fire-hazards - Overhead hazards/obstructions - Potential for body entrapment/crushing - Rotating equipment, moving parts.	☐ Operators shall follow safe work practices for operation of heavy equipment: • Only trained/qualified persons allowed to operate heavy equipment. • Wear seat belts; roll-over protection system present/deployed; do not exceed maximum safe slope. • No passengers on moving/operating equipment except where passenger seat/restraint is present. • Equipment inspected daily upon mobilization; maintained in good repair, backup alarms, windows clear. • Leaks or defective safety equipment should be repaired before use; fire extinguisher present. • Maintain eye contact with ground personnel and use hand signals to direct their approach near equipment. • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Cease operation if personnel enter swing radius, travel path or hazard zone of moving parts, elevated loads. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Equipment locked, secured, brakes set, buckets/forks lowered, extendable parts retracted, when not in use. • Shut down/lock out equipment to prevent crush situation beneath or between moving parts of equipment. • Ensure personal/support vehicles are parked/located to not obstruct equipment travel lanes/operating zones. • Mark temporary roadways clearly, provide berms/stops where needed. ***HSE Program Documents:*** HSE SOP-644: Working Around Heavy Equipment
☐	**TRENCHING/EXCAVATION** Hazards: - Cave-in, entrapment - Hazardous atmosphere - Water accumulation - Falls into excavations	☐ Safe work practices when personnel will enter trenches/excavations: • Activities under supervision/oversight of Competent Person, conduct daily inspection of excavation. • Excavated materials placed at least 2' from trench sidewall. • Prevent water accumulation in trench. • Sloping & shoring for trenches/excavations >20' deep must be approved by a Professional Engineer.

	- Utility-related hazards - Undermining structures & foundations	• Sloping/shoring/trench box for excavations >5' when persons enter trench/excavation. • Sloping/shoring/trench box for shallow (<5') trench/excavation with cave-in hazard. • Workers in trenches shall be within 25 feet of ladder or sloped entryway. • Excavations shall be protected by perimeter fencing (not barricade tape), if potential for personnel to fall into. • If potential for atmospheric hazard, see **D.12. "Confined/Enclosed Spaces"** ***HSE Program Documents:*** HSE SOP-432: Excavation and Trenching Activities
☐	**FORKLIFT** Hazards: - Struck-by - Run over/roll over/tip over - Overhead utilities/obstructions - Caught between (pinch points) - Unstable/falling loads - Elevated forks - Fluid leaks	☐ In addition to general safety practices for heavy equipment (above), as applicable: • Qualified operator, per established forklift training (certificate is required); Geosyntec operator must be approved by Director of Health and Safety. • Equipment inspected daily and documented on Forklift Preoperational Inspection Checklist. • Do not exceed lifting load limits. • Forklift shall not be moved/driven with empty forks in raised position. • When not in use, forks lowered, brake set, controls in neutral, key removed. ***HSE Program Documents:*** HSE SOP-436: Safe Operation of Forklifts and Mobile Equipment
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - Falls from basket - Overhead utilities/obstructions - Struck-by, run over, tip over - Caught between (pinch points) - Tip over - Fluid leaks	☐ Follow safe work practices: • Operators shall be appropriately trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn when operating a boom lift (optional for scissor lift). • Overhead hazards and surface obstructions shall be reviewed with operators/riders prior to use. ***HSE Program Documents:*** HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)
☐	**CRANES** Hazards: – electrocution by overhead utility – injury in swing radius – injury from falling load – crane tipping over due to overbalancing, high winds, unstable ground, unsafe slope, bad placement of outriggers – injury from mechanical hazards	☐ In addition to general safety practices for Operation of Heavy Equipment (above), as applicable: • Only qualified persons operate cranes (certificate required). • Critical Lift Plan & Checklist prepared/executed (See Procedure) prior to mobilization. • Equipment shall be inspected prior to mobilization and daily by crane operator. • Crane operator will remain at the controls at all times during operation. • Crane operation must be performed under the direction of an appointed signal person at all times using hand signals and/or voice/radio communication. • Crane shall be level and stable (solid ground or crane mats/timbers, outriggers if present, cribbing); over-reaching or exceeding load limits is prohibited. • Keep area beneath suspended loads clear of personnel; tag lines used to maneuver load. • Rigging procedures – see Mechanical Lifts with Rigging, below.
☐	**MECHANICAL LIFTS WITH RIGGING** Applies to lifting by rigging attached to crane, truck-mounted boom rig (e.g. drill rig), heavy equipment, mechanical/electrical hoist, similar equipment. Hazards: – Mechanical hazards – Elevated loads	☐ In addition to general safety practices for Operation of Heavy Equipment and Cranes (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Coordinate lifting operations with competent person. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device (such as davit arm) are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads and that tag lines are used where appropriate.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*
☐	**DEMOLITION**	☐ Develop/implement a demolition safety plan.
☐	**BLASTING, UNEXPLODED ORDNANCE**	☐ Develop/implement safety plan for blasting, unexploded ordnance, as applicable. ***HSE Program Documents:*** *HSE SOP-622: Blasting & Use of Explosives*
☐	**PUBLIC AT RISK, SITE SECURITY**	☐ During site operations protect public (overhead protection, fencing, barriers, warning signs). ☐ During off hours, protect public with fencing, barriers, warning signs/lights, other measures as appropriate. ☐ Lock/secure hazardous materials and/or equipment.

D.9. STORAGE/HANDLING OF BULK MATERIALS (for *Chemical* Storage, see D.14 & 15) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:	
☐	**BULK STORAGE HAZARDS:** ☐ Store materials in stable manner (stacked, racked, blocked, interlocked, tied, wrapped, or otherwise secured) to prevent tipping, sliding, rolling, falling or collapse.

	Collapse/movement of stacked/stored bags, blocks, containers, pipe, boxes, equipment, and similar. ☐ Stack/pallet/rack/shelf ☐ CONEX-box storage, or similar	☐ Do not exceed load limits and ensure storage structure is stable, robust, secure for intended load. ☐ Ensure stored materials do not block aisles, passageways, electrical panels, emergency equipment, emergency access/egress routes, vehicle routes.
☐	**LIFTING/MANUAL MATERIAL HANDLING HAZARDS**	☐ During manual handling of materials and equipment, use safe lifting practices and/or lift aids; do stretches and use safe postures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.10. ELECTRICAL WORK TASKS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**USE OF BATTERIES, BATTERY-POWERED EQUIPMENT <50 V, OR OTHER DC EQUIPMENT < 50 V** Potential fire hazard (if terminals are shorted), eye/skin hazards (when electrolyte is replenished), inhalation hazard in enclosed spaces.	☐ Follow safe work practices to control hazards of voltage, shock, arcing, overheating, hazardous gases, irritant electrolytes, secondary hazards. ☐ Prevent short-circuiting of terminals when battery is in use (segregated from tools, metal objects) and during transport (use battery transport container or install guard/cover on positive terminal). ☐ For batteries requiring replenishment of electrolyte, use PPE for eye and skin protection, and have eyewash equipment at hand; see discussion of *acids/caustics/corrosives* in **D.14. "Commercial Chemical Products."**
☐	**"NORMAL OPERATION" OF ELECTRICAL EQUIPMENT CONNECTED TO AC OR DC POWER SOURCE ≥ 50 V:** Electrically powered tools, equipment, machinery, extension cords, portable generators, working near electrical equipment. Hazards: – Electrical shock – Fire Hazard – Secondary hazards (falls, other injuries).	☐ Follow "normal operation" requirements: • All electrical enclosures/guards/covers must be in place/closed/secured. • Electrical equipment maintained per codes/standards/manufacturer's recommendations. • Ensure no indication of damage or impending failure (heat, smoke, buzzing, odors, arcing, melting). • Operate equipment in accordance with manufacturer's standard operating procedures. ☐ Follow general electrical safety work practices to minimize shock hazard and secondary hazards: • Control water-related/wet-location hazards in a manner appropriate for the job tasks/equipment/tool. • Never touch electrical equipment if you are wet or standing/kneeling in water or on wet surfaces. • Use extension cords/power cords properly, rated for use conditions and current draw, prevent damage. • Inspect tool/equipment/extension cords/power cords before each use; remove from use if damaged. • Use GFCI-protected outlet or portable GFCI in wet/moist locations, outdoors, basements, concrete floors. • Do not enter any space delineated by an electrical approach boundary.
☐	**HANDS-ON DIAGNOSTICS/REPAIR ON CIRCUIT(S) CONNECTED TO POWER SOURCE < 50 V:** ☐ AC ☐ DC ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Stray voltage from soil electrodes	☐ Implement electrical safe work practices pertaining to: • Workers trained appropriately for the task. • Shock prevention measures. • Eye/skin protection for arcing hazards. • Protection from secondary hazards.
☐	**WORK WITHIN *"APPROACH BOUNDARY"* OF EXPOSED, ENERGIZED (OR POTENTIALLY ENERGIZED) CONDUCTORS AND/OR CIRCUIT PARTS CONNECTED TO POWER SOURCE 50-600 V*:** ☐ AC ☐ DC ☐ 3-phase ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Induced voltage ☐ Stray voltage ≥50V from soil electrodes *** Working on >600 V not permitted for Geosyntec personnel**	☐ Prepare project-specific written "Electrical Safety Program" addressing (at a minimum): • Workers trained/designated as "Qualified Electrical Workers" per NFPA 70E (US)/CSA Z462 (CAN) • Assess risks of electrical shock (voltage levels and sources), arc flash hazard and secondary hazards. • Affix electrical hazard warning label to electrical enclosure(s) to be accessed. • Physically delineate arc flash- or limited approach boundary, whichever is farthest from hazard source. • Only "qualified" workers allowed within approach boundaries; prevent entry by non-qualified personnel. • Establish electrically safe working condition; work on live circuits prohibited (except for diagnostic testing). • Use PPE for shock/arc flash protection, as required. • Use other safe procedures/equipment required for the task, such as lockout/tagout.
☐	**LOCKOUT/TAGOUT (LO/TO) OF ELECTRICAL ENERGY** To prevent unplanned start-up or release of energy when equipment is under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only), HSE SOP-452a: Lock-out/Tag-out (North America-only) HSE SOP-454a: General Electrical Safety (US-only)*

D.11. UTILITY-RELATED HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Both a public utility locate ticket was submitted and a private locator will locate the immediate sub slab sampling areas.

☐	**OVERHEAD, ABOVE-GROUND UTILITIES**	☐ Do not cross approach boundaries with personnel or equipment; employ other appropriate precautions for the conditions (specify above). ☐ Use additional controls, as applicable: shielding, flagging, observer/monitor, or, ☐ Arrange for power company/utility owner to de-energize power line.
☒	**UNDERGROUND UTILITIES**	☒ Confirm appropriate underground utility clearance procedures have been completed prior to ground penetrations, and employ other utility clearance/locator practices, as appropriate for conditions. ☐ Hand digging/augering or vacuum post-holing within 3' of utility locations or other high-risk condition.

HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.12. CONFINED / ENCLOSED SPACES (Including Hazardous Indoor Spaces) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

Type of CONFINED/ENCLOSED/ HAZARDOUS INDOOR Workspace:
- ☐ Indoors (occupied)
- ☐ Indoors (abandoned, vacant)
- ☐ Basement, crawl space, attic
- ☐ Tunnel, shaft, inspection gallery
- ☐ Storage bin, locker
- ☐ Culvert, catch basin, sewer
- ☐ Well vault, utility vault, manhole
- ☐ Tank, vessel, silo, vat, hopper
- ☐ Trench, excavation
- ☐ Machine/equipment pit
- ☐ Transportation container, railcar
- ☐ Other – describe above

Confirmed or potential hazards:
- ☐ Flammable/explosive
- ☐ Oxygen deficiency
- ☐ Hydrogen sulfide
- ☐ VOCs
- ☐ Carbon monoxide
- ☐ Combustible dust
- ☐ Combustion/exhaust emissions
- ☐ Welding/cutting fumes
- ☐ Electrical
- ☐ Mechanical equipment
- ☐ Entrap, engulf, drowning
- ☐ Building-related hazards
- ☐ Other – describe above

REQUIREMENTS:

1. **Contact Corp. HSE Department** will determine applicability of confined space entry regulations, and to determine safe work practices for entry into any confined, enclosed or hazardous indoor spaces.

2. **Classify the work task** by checking **one** of the following:

   ☐ **CONFINED SPACE** classified by regulatory authority as a "**Permit-Required Confined Space**" or otherwise specifically-regulated as a **confined space** in the worksite's geographic jurisdiction.

   ☐ **CONFINED/ENCLOSED/INDOOR space NOT specifically regulated as a Confined Space;** develop site-specific entry procedure **per applicable regulatory and Geosyntec safety requirements**.

3. **Delineate tasks, hazards and controls** associated with the work in **Section C.1. "Summary of Tasks, Hazards and Controls,"** and in applicable sections in **Parts C, D and E of this THA**; incorporate or attach applicable safety provisions such as, but not limited to, the following:
   - Risk assessment; entry plan, entry permit system/safety checklist.
   - Air monitoring for atmospheric hazards.
   - Entry roles (supervisor, entrant, attendant), buddy system, regulatory training requirement.
   - Protect non-entry personnel from unauthorized entry (labels, signage, barriers)
   - Ingress/egress (stairway, ramp, ladder, tripod/winch, harness/lifeline, etc.).
   - Communication/alerting/rescue/emergency plan.
   - Entry hazard controls:
     - Isolate, clean, purge, inert, lockout/tagout, fire prevention.
     - *Dilution* ventilation to introduce fresh air
     - *Exhaust* ventilation to control point source of emissions.
     - Use duct/stack to direct hazardous emissions away from work area.
     - Respiratory protection.
     - Use PPE and safety gear to protect from chemical/physical/biological hazards.
     - Fall protection.
     - Traffic control.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE SOP-412a: Confined Space Entry Operations (US-only), HSE SOP-460: Field Site Exposure Monitoring*

D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

HAZARD TYPE:
- ☐ Contagious respiratory illness
- ☐ Vector-borne infectious risk
- ☐ Wastewater, sewer, landfill
- ☐ Animal/human waste
- ☐ Wildlife contact, infectious risk
- ☐ Mold, fungi, valley fever
- ☐ Bloodborne pathogens
- ☐ Discarded syringes
- ☐ Medical waste
- ☐ Other (describe above)

- ☐ Follow internal guidance for mitigating airborne respiratory illness transmission (as applicable).
- ☐ Implement vector-protective measures (see also **Section D.1.b., "Biological Hazards"**)
- ☐ Use "Standard/Universal Precautions" as applicable to mitigate exposures to infectious/pathogenic hazards.
- ☐ Low hazard – use basic hygiene: onsite hand washing (soap & water preferred) and protective apparel/PPE.
- ☐ Med/high hazard – added PPE (gloves/barriers/respirator/dust mask), decon, remediation, as appropriate.
- ☐ For bloodborne human pathogens follow Bloodborne Pathogen Program and Standard/Universal Precautions.
- ☐ Contact HR Dept. for project-specific immunization (e.g. tetanus/diphtheria/pertussis [Tdap], hepatitis A/B).
- ☐ Implement remedial actions to mitigate infectious hazard source (remove syringes, clean up unsanitary waste/debris, decon/disinfect surfaces, etc.) as appropriate for the scope/scale of work.

HSE Program Documents: *HSE SOP-240: Mitigating Respiratory Illness Transmission in the Workplace*, *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants, HSE SOP-612a: Bloodborne Pathogens (US-only)*

D.14. COMMERCIAL CHEMICAL PRODUCTS (per HAZCOM or WHMIS) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**PRODUCTS REGULATED BY HAZCOM[1] (US) or WHMIS[2] (CAN)**	☐ Safety Data Sheets (SDSs) available, either on site or readily available within same work shift, containers labelled properly, workers trained/oriented on hazards. ☐ For subcontractor/contractor use of chemical products, confirm SDS availability for affected onsite workers.
	[1] OSHA Hazard Communication Standard (United States); [2] Workplace Hazardous Material Information System (Canada)	
☐	**GENERAL SAFE WORK PRACTICES FOR FIELD USE OF CHEMICALS**	☐ Consult SDS for HSE hazards, symptoms of exposure; ensure workers have been apprised of safe practices. ☐ Handle with care, maintain good housekeeping, provide adequate illumination in work area. ☐ Pour/dispense/transfer liquid chemicals on stable work surface. ☐ Use chemicals in well-ventilated area; use fans/blowers/exhaust for active ventilation, as appropriate. ☐ Have eyewash bottles, eyewash station, deluge capabilities, commensurate for the hazard, readily available. ☐ Have spill/neutralization equipment, appropriate for the chemicals, readily available. ☐ Conduct air monitoring as appropriate; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**STORAGE/TRANSPORT OF CHEMICALS/HAZMAT** ☐ **Non-Emergency (Routine) Chemical Storage** Risk of personal contact and/or incidental release ☐ **HAZMAT Transport** ☐ **Risk of Emergency Spill/Release** ☐ **CFTAS (Chemical Facility Anti-Terrorism Standards) Applicability:** On-site overnight storage of non-waste chemical product at quantity ≥25 gal(115L) or ≥250 lbs. (115 kg)	☐ Transport chemicals only in sealed containers, secured to prevent shifting/breakage during travel. ☐ Store chemicals only in sealed containers; overnight storage in squirt/spray bottles prohibited. ☐ Store flammable/combustible liquids in chemical storage cabinets, or other appropriate storage arrangement. ☐ For liquids, provide secondary containment during storage. ☐ Segregate incompatible chemicals during storage. ☐ For *incidental release/spill;* maintain spill kit suitable for low flammability/toxicity/quantity/volatility release. ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/ Transportation.** ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate emergency response contact in Part B, "Emergency Response and First Aid." ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable. ☐ For CFTAS-applicable chemical storage, a safety and chemical management plan must be prepared and reviewed by a HSE Professional before bringing material to the site. (Does not apply to materials brought on to the site for daily work purposes and transported away at the end of each day)
☐	**COMPRESSED GAS CYLINDERS** ☐ Flammable ☐ Non-flammable ☐ Toxic ☐ Asphyxiant ☐ Oxygen	☐ Secure cylinders upright, caps on when not in use. ☐ Handle with care; use and store cylinders in a manner and location to prevent damage. ☐ Propane cylinders not in use must be stored outdoors in a cage or similar secure ventilated enclosure. ☐ Ensure acetylene cylinders are NOT secured to steel arc welding bench. ☐ Segregate oxygen and fuel gases by distance (20') or fire-rated barrier. ☐ Control ignition sources. ☐ "No smoking" signage at cylinder storage area for flammable gases.
☐	**FLAMMABLE/COMBUSTIBLE LIQUIDS**	☐ Use proper fuel safety can (metal fuel container with self-closing spout and flame arrestor preferred). ☐ Control/remove ignition sources near storage and use areas. ☐ Grounding and bonding where appropriate. ☐ Ensure a Type B or ABC fire extinguisher is readily available.
☐	**ACIDS, CAUSTICS, OTHER CORROSIVES**	☐ Use appropriate protection for eyes/face (goggles/face shield) and skin (gloves, sleeves, apron). ☐ Use eyewash, deluge shower, drench hose, hand washing (with water), as appropriate. ☐ For severe eye hazards (due to high corrosivity, large quantity), 15-min. eyewash required.
☐	**TOXIC**	☐ For toxic substances, use/store in a manner to control exposure hazards (inhalation, ingestion, skin contact, skin absorption); use active ventilation and/or PPE as appropriate.
☐	**EMISSIONS FROM FUEL COMBUSTION, HOT PROCESSES** ☐ Gasoline ☐ Diesel ☐ Propane/Natural Gas ☐ Welding/cutting/hot work ☐ Vehicle/equipment exhaust ☐ Other	☐ Position outdoor personnel upwind of exhaust source. ☐ Avoid "idling" of equipment when not in use. ☐ Use *passive ventilation* (air infiltration/air currents) to disperse atmospheric hazards in breathing zone. ☐ Use *dilution ventilation* (blowers/fans) to provide fresh air to work area and dissipate atmospheric hazards. ☐ Use *exhaust ventilation* (hood/duct/exhaust stack/blower) to capture/divert exhaust from work area. ☐ Use respiratory protection for high levels of smoke, exhaust particulates, soot. ☐ Conduct air monitoring as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
☐	**OTHER HAZARDS**	☐ Describe other hazardous substances and safety measures under "Site-Specific Notes & Clarifications," above.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-460: Field Site Exposure Monitoring*

D.15. SITE CONTAMINANTS, CHEMICAL WASTES ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Chlorinated solvent tetrachloroethylene and daughter products resulting from former dry cleaning operations. Drilling though tile or concrete could result in crystalline silica dust exposure. A dust mask or other dust control such as a vacuum will be used.

CHECK ALL THAT APPLY. Provide site-specific notes/clarifications above.

☒ Soil/groundwater contaminants (historical release)	☐ Explosive dust	☐ Potential for flammable gas (methane)
☐ Recent release, known high concentrations	☐ Oxygen deficiency	☐ Corrosive, acids/caustics, strong irritants
☐ Former chemical disposal site, landfill	☒ Chlorinated volatile organic compounds (VOCs)	☐ Asbestos abatement work
☐ Urban fill, residual contaminants	☐ BTEX, petroleum derived VOCs	☐ Pesticides, herbicides, fungicides
☐ Containerized waste (drums, process equipment)	☐ Fuel oils, petroleum, waste oil, lubricants	☐ Sensitizers
☐ Buried drums (known or potential)	☐ Metals, metal compounds, metal dusts	☐ Radioactive contaminants
☐ Large containers, potential for spills	☐ Elemental mercury	☐ Controlled substances, drugs
☐ Contaminated building surfaces	☐ Polyaromatic hydrocarbons (PAHs)	☐ Wildfire smoke, see *HSE SOP 470a Protection from Wildfire Smoke Exposure*
☐ Unexploded ordnance	☐ Potential for flammable vapors	☐ Other - describe above

NOTE: For sites with one or more **"high-risk contaminants"** (below) designated/recognized as a *contaminant of concern*, or *exceeding an environmental reporting threshold*, or representing a *potential exceedance of an action level or exposure limit*, the THA must be reviewed by the HSE Dept. before initiating the work:

☐ Asbestos	☐ Chromium VI (hexavalent chromium)	☐ Lead
☐ Arsenic/arsenic compounds	☒ Crystalline Silica (airborne)	☐ Methylene chloride
☐ Benzene	☐ Dioxins	☐ Polychlorinated biphenyls (PCBs)
☐ Beryllium	☐ Mercury	☐ Vinyl chloride
☐ Cadmium	☐ Hydrogen Cyanide (HCN)	

☐ **FOR WORK CONSISTING OF CLEANUP OPERATIONS, CORRECTIVE ACTIONS, PRELIMINARY INVESTIGATIONS at an "UNCONTROLLED HAZ. WASTE SITE" (per HAZWOPER, 29 CFR 1910.120 or equivalent), delineate procedures in "Site-Specific Notes and Clarifications" (or attachments) addressing the following, as applicable to the work:**

- Workers attend **pre-work orientation** on hazards, risks, onsite safety measures, emergency contingencies.
- Implement **site control plan** - delineate Exclusion Zone(s), Contaminant Reduction Zone(s), Support Zone (aka EZ, CRZ, SZ).
- Include **site map/figure** depicting work locations and other relevant site-specific information.
- Site workers in EZ or CRZ shall have **40-hour HAZWOPER training**, current 8-hour refresher, 3 days supervised field experience.
- Site supervisor(s) shall have **8-hour Supervisor training**.
- Site workers in EZ or CRZ shall participate in **medical monitoring** program, as applicable.
- Implement **site-specific procedures** for worker protection via engineering controls, work practices, personal protective equipment (PPE), air monitoring, decontamination procedures, spill containment, emergency preparedness and response.
- Conduct **air monitoring**, as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
- **PPE program: S**pecify **Levels of Protectio**n and specific PPE to be used for applicable tasks;
  - **Level D**: No respirator, no chemical protective clothing, standard work clothes, basic PPE; (COVID-19 face covers allowed)
  - **Modified Level D**: No respirator, chemical protective clothing as appropriate; (COVID-19 face covers allowed)
  - **Level C**: Air-purifying respirator, chemical protective clothing as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level B**: Air-supplied respirator, chemical protective clothing/suit as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level A**: Fully encapsulating suit, self-contained breathing apparatus (SCBA); **Level A prohibited for Geosyntec personnel.**

☒ **FOR SITE WITH CHEMICAL CONTAMINANTS OR WASTE BUT NOT REGULATED BY HAZWOPER**

- Workers shall be knowledgeable/aware of chemical hazards thru safety training/orientation and availability of hazard information.
- Implement controls to minimize worker exposure through engineering controls, work practices, PPE, decon, as appropriate.
- Evaluate worker exposure via air monitoring/sampling, as applicable; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**

☐ **STORAGE/TRANSPORT OF IDW***

Spill/Release Risk:

☐ Risk of *incidental spill/release*

☐ Risk of *emergency spill/release*

** Investigation-Derived Waste*

- ☐ Describe site-specific procedures above for spill containment, container handling, as applicable.
- ☐ For liquids, provide secondary containment during storage.
- ☐ Segregate incompatible chemicals during storage.
- ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable.
- ☐ For *incidental spills*; spill kit on-site for low-hazard releases (low-flammability/toxicity/quantity/volatility)
- ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate Emergency response contact in Part B, "Emergency Response and First Aid."
- ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/Transportation."**

☐ **OFF-SITE MIGRATION OF AIRBORNE CONTAMINANTS**

- ☐ Implement controls to minimize hazard migration (dust suppression, covers, foam, etc.).
- ☐ Community/perimeter air monitoring will be conducted per perimeter air monitoring plan; see **E.3 "Fence Line/Perimeter Air Monitoring."**

***HSE Program Documents**: HSE STD-120: Occupational Medical Management Program, HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-301a: Contaminated Site Investigation & Remediation (US-only), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-634: Drum Sampling, HSE SOP-636: Handling of Uncharacterized Hazardous Waste Containers , HSE SOP 470a Protection from Wildfire Smoke Exposure*

D.16. RADIATION HAZARDS (Other than Sunlight) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.17. SHIPPING/TRANSPORTATION HAZMAT/DANGEROUS GOODS ☐ Applicable ☒ Not Applicable, Not Anticipated

MODE(S) OF TRANSPORT:	☐ Road	☐ Rail	☐ Air	☐ Sea	☐ Inland Waterway	☐ International

IMPORTANT: Ensure that each individual who will be involved in shipping/transportation of hazardous material is current with required training (awareness, function-specific, safety, security) in accordance with applicable regulatory authority (DOT, FAA, IATA, TDG), and ensure adherence to applicable regulations.

HSE Program Documents: *HSE SOP-235a: Hazardous Materials Shipping (US-only)*

Site-Specific Notes & Clarifications: Transporting small helium tanks via field vehicle to and from the site.

PART E – AIR MONITORING, WORKER EXPOSURE MONITORING

E.1. AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes, Clarifications: concrete dust produced during drilling.

AIR-TESTING PARAMETERS - Select site-specific testing parameters; list associated equipment in Part C.2, Safety Equipment List.

☐ **VOCs** ☐ **PID** (Photoionization detector): **X** eV ☐ **FID** (Flame ionization detector) ☐ **Colorimetric indicator tubes** – describe above	☐ **O_2** (Oxygen) – oxygen meter ☐ **LEL** (Lower Explosive Level) - LEL meter ☐ **H_2S** (Hydrogen Sulfide) – H_2S detector ☐ **CO** (Carbon monoxide) – CO detector	☐ **Particulates** - total dust meter ☐ **% Methane** – methane meter ☐ **Calibration kit** for each parameter ☐ Other:

SUBSTANCE-SPECIFIC (PRE-SET) ACTION LEVELS - Sustained breathing zone action levels (sustained general work-area levels for LEL).

☐ **O_2** (Oxygen)	**19.5-23%**	Acceptable to continue work without O_2-focused respiratory protection.
	<19.5%	STOP WORK, ventilate to raise O_2 to >19.5% for re-entry. For persistent hazard, contact Corp. HSE Dept.
	>23.0%	STOP WORK, ventilate to lower O_2 to <23% for re-entry. For persistent hazard, contact Corp. HSE Dept.
☐ **LEL** (Lower Explosive Limit)	IMPORTANT:	Confirm sufficient oxygen is present (min. 8-12%) to ensure accurate LEL readings.
	<10% LEL	Acceptable to continue working in work area; continue to monitor LEL.
	≥10% LEL	STOP WORK. Implement controls (reposition workers, ventilate, contain/eliminate source, etc.); resume work ONLY when LEL readings are <10%, sustained.
☐ **H_2S** (Hydrogen Sulfide)	**< 1 ppm**	Acceptable to continue work without H_2S-focused respiratory protection.
	1-10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <1ppm, or use APR* with *VOC/acid-gas* cartridges (yellow); do not exceed MUC* for respirator type; confirm acceptability of respirator usage with HSE Dept.
	> 10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <10ppm (with respirator), or <1ppm (without respirator). For persistent levels >10 ppm, STOP WORK, contact task lead, PM or HSE Dept.
☐ **CO** (Carbon Monoxide)	**< 25 ppm**	Acceptable to continue work without CO-focused respiratory protection.
	≥ 25 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <25ppm. For persistent levels >25ppm, STOP WORK, contact PM and/or HSE Dept.
☐ **WILDFIRE SMOKE** (AQI for PM 2.5)	**≤69**	In this **Air Quality Index (AQI)** range, it's acceptable to continue work without respiratory protection.
	>69 – <100	Voluntary use of N95 respirator is appropriate.
	>101 – <500	Distribute N95 respirators to all personnel Provide work and/or rest areas in enclosed buildings. Relocate work indoors, or to an outdoor location with a lower AQI; Changing work schedules so outdoor work can occur when the AQI is lower; Providing portable HEPA filters in enclosed areas; Reduce the amount of work that involves physical exertion, and provide additional rest periods. Consider rescheduling fieldwork to a date/time when the AQI is likely to be lower.
	>500	STOP WORK, or use APR* with approval of HSE Dept.
☐ **<OTHER>**		

SITE-DERIVED ACTION LEVELS – Sustained breathing zone action levels; derived based on site contaminants; REVIEW WITH CORP. HSE DEPT. REQUIRED.

☐ **VOCs** (Volatile Organic Compounds)	**< X ppm**	Acceptable to continue work without VOC-focused respiratory protection.
	> " ppm	Implement controls (reposition workers, ventilation, containment, eliminate source, etc.) to lower VOC exposures to less than specified action level, or use APR* with approval of Corp. HSE Dept.
	X to X ppm	Use APR* with *VOC* cartridges (yellow or black); do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.
	> X ppm	STOP WORK. Implement controls, for persistent levels greater than action contact PM and/or HSE Dept.
☒ **AIRBORNE DUST** (Total Particulates)	**< X mg/m³**	Acceptable to continue work without particulate-focused respiratory protection.
	> " mg/m³	Implement controls (water spray, reposition workers, ventilation, containment, etc.) to lower dust levels to less than specified action level, or use APR* with approval of HSE Dept.
	X to X mg/m³	Use APR* with particulate cartridges appropriate for the hazard; do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.

	> mg/m³	STOP WORK. Implement controls. For persistent levels greater than action level, contact PM and/or Corp HSE Dept.
☐ <OTHER>		

* Air-purifying respirator ** Maximum use concentration

HSE Program Documents: *HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP 470a Protection from Wildfire Smoke Exposure*

E.2. OTHER WORKER EXPOSURE MONITORING / SAMPLING ☐ Applicable ☒ Not Applicable, Not Anticipated

☐ Heat/Cold Stress Testing/Monitoring	☐ Wildfire Smoke – Tracking AQI (Air Quality Index)	☐ <Other>
☐ Air Sampling *(sample collection, passive dosimeter)*	☐ Ionizing or Non-ionizing Radiation Testing	☐ <Other>
☐ Wipe/Bulk Sampling *(to evaluate worker exposure)*	☐ Noise Testing	

Site-Specific Notes, Clarifications:

HSE Program Documents: *HSE STD-135: Hearing Protection Program, HSE STD-140: Radiation Safety Program, HSE SOP-230: Ionizing and Non-Ionizing Radiation Protection, HSE SOP-409: Heat Illness Prevention, HSE SOP-410: Cold Stress Prevention, HSE SOP-462: Asbestos Exposure Control, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP-468a: Respirable Crystalline Silica Exposure Control (US-only), , HSE SOP 470a Protection from Wildfire Smoke Exposure*

E.3. FENCELINE / PERIMETER AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Fence line/perimeter air monitoring to be conducted in accordance with a separate **"Perimeter Air Monitoring Plan"** for this work; results from *fence line/perimeter* air monitoring shall NOT be used as the sole basis for determining *work zone* atmospheric hazards.

Site-Specific Notes, Clarifications:

PART F – APPROVALS, ACKNOWLEDGEMENTS

F.1. THA PREPARATION, REVIEW/APPROVAL SIGNATURES A THA is typically prepared by project staff, often with input from an HSC, with review/approval, at a minimum, by PM and/or Field Lead. Corporate HSE staff must be consulted as required or otherwise deemed appropriate*.

	Printed Name	***Signature***	***Date***
PREPARER(S)	Jensen Perrick		7/1/2025
THA REVIEWED/ APPROVED BY: (Project Manager or PM-Designee, at a minimum)**	***Printed Name***	***Signature***	***Date***

* At a minimum, Corp. HSE **must** review/approve the THA review when Geosyntec staff will encounter "high hazards/high risks," or perform critical tasks, such as (but not limited to):

- Work at heights >10', use personal fall apparatus
- Work at height near overhead electrical utility lines
- Operate a UTV/ATV, aerial lift or fork-lift
- Tow a trailer on roadway
- Oversee a hot-work permit system
- Enter a hazardous confined/enclosed space
- Use of unmanned aerial vehicle (drone)
- High-risk ergonomic/musculoskeletal hazard
- Implement lockout/tagout controls
- Enter a trench/excavation >5' deep
- Function as a construction "Competent Person"
- Operate a pneumatic or powder-actuated tool
- "Qualified" Electrical testing & maintenance >50 V
- High risk, non-typical infectious/pathogenic hazard
- Derive action levels for VOCs or toxic dusts
- Instrument monitoring for critical exposure risks
- Wear a respirator
- Presence of "high-risk" contaminant(s)
- Sustained exposure to wildfire smoke $AQI_{PM\ 2.5}$ >150
- Exposure to radioactive isotopes (α, β, γ)
- High-risk exposure to: non-ionizing (microwave, EMF, UV, IR) or ionizing (radio-isotope, x-ray) radiation.
- Onsite risk of emergency chemical spill
- Applicability of Chemical Anti-Terrorism Standards

Corporate HSE **must** also be consulted when Geosyntec subcontractors (*under Geosyntec's oversight*) perform high hazard/high risk work (such as demolition, blasting, crane critical lifts, confined space entry, testing/maintenance of electrical systems, lockout/tagout, HAZWOPER cleanup activities). Consultation with Corp. HSE is encouraged for all questions/concerns regarding worker safety, regulatory compliance, risk/liability aspects, or project-specific safety requirements.

** It is recommended that THAs be approved/signed by both the PM *and* Field Lead (or alternate PM designee), unless due to small scope/scale or routine nature of task, or staff unavailability, only one approval is deemed sufficient by PM. Additional review and approval will be performed by Corp. HSE for high-hazard/high-risk tasks, or as otherwise requested.

HSE Program Documents: *For more information, see "HSE STD-105, Project Safety Management Handbook".*

F.2. GEOSYNTEC FIELD CREW ACKNOWLEDGEMENTS

Please sign below to acknowledge you reviewed and understand this THA, participated in project safety briefing and had an opportunity to ask questions about the information herein.

Printed Name	Signature	Employee No.	Date

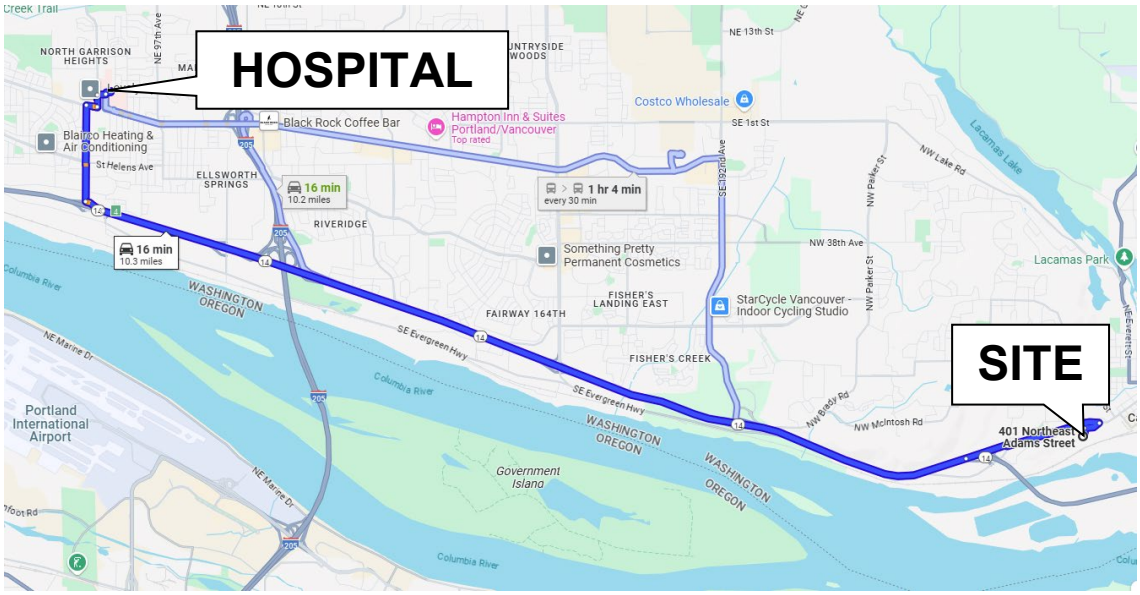
F.3. SUBCONTRACTOR'S FIELD CREW ACKNOWLEDGEMENTS ☐ Applicable ☐ Not Applicable

Please sign below to acknowledge this THA was made available to you, and you had an opportunity to ask questions about the information herein.

Printed Name	Signature	Company Name	Date

ATTACHMENTS:

Attachment A – Route to Hospital



Hospital Name: Peace Health Southwest Medical Center
Address: 400 NE Mother Joseph Place
Phone Number: (360) 729-8370

Directions To Hospital From Site:
Get on WA-14 from NW 6th Avenue (4 min, 1.4 mi)

- Head north toward NW 6th Avenue (371 ft)
- Turn right (0.1 mi)
- Turn left onto NW 6th Avenue (0.8 mi)
- At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Follow WA-14 W to S Lieser Road in Vancouver. Take exit 4 from WA-14 W (8 min, 7.8 mi)

- Merge onto WA-14 W (7.6 mi)
- Take exit 4 for Lieser Road toward SE 88th Ave (0.2 mi)

Continue on S Lieser Road. Drive to NE Mother Joseph Place (4 min, 1.1 mi)

- Turn right onto S Lieser Road (0.8 mi)
- Turn right onto E Mill Plain Boulevard (489 ft)
- Use the 2nd from the left lane to turn left onto NW 87th Avenue (0.1 mi)
- Turn right toward NE Mother Joseph Place (367 ft)
- Turn left toward NE Mother Joseph Place (335 ft)

HSE Event Response and Notification

Geosyntec consultants

CHOOSE THE BEST PATH!

EMERGENCY EVENT (catastrophic occurrence, injury or illness requiring emergency medical care, etc.)

IMMEDIATELY CALL 911 or alternate emergency number for your locale*

Conduct First Responses (rescue/assist injured, stop work, evacuate, stabilize worksite, other**)

Meet Arriving Emergency Responders and apprise them of the situation (fire, ambulance, police, other)

Notify HSE TEAM ASAP by phone or EVENT NOTIFICATION TOOL

NOTIFY your Manager, Supervisor, Client, and other key contacts ASAP

COMPLETE full *Incident Report* within 24 hours (use link in followup email you'll receive after submitting an **EVENT NOTIFICATION**)

NON-EMERGENCY EVENT or **NEAR MISS**

Stabilize the situation and provide initial care/support**

Notify HSE Team using EVENT NOTIFICATION TOOL within 1 hour after injury/illness or vehicle accident; by end of workday for other events.

For injury/illness or vehicle accident, HSE will attempt call-back within 1 hour of EVENT NOTIFICATION

Proceed as Directed by HSE for Medical Triage* and other aspects**

GOOD CATCH (Observed unsafe condition or non-compliance, positive safety observation, improvement suggestion, etc.)

Submit a **Good Catch** using the EVENT NOTIFICATION TOOL (on same day of occurrence)

IMPORTANT: To load the **EVENT NOTIFICATION TOOL** onto your mobile device, scan this QR code:

* 911 in North America; 112 in EU; 999 & 112 both applicable in UK; 000 in Australia; for other country- or site-specific numbers, see your Written Safety Plan or Office Emergency Plan

** First response actions by site/project team should always be in accordance with general-duty obligations, on-site roles, and training qualifications

*** Employees may initiate a call for medical triage/support if no call-back received from HSE within 60 minutes of Event Notification, or if HSE is not available directly by phone. For the medical support contact in your location (*WorkCare in North America; location-specific elsewhere*) see your Written Safety Plan or Office Emergency Plan, as applicable

If you have questions or concerns about any workplace health and safety matter, please contact a member of your Corporate HSE Team for assistance:

Global HSE Director
Bob Poll
M: +1 813-240-9231

HSE Programs Professional
Andrew Thomas
M: +1 508-649-3254

Multinational Region
Jason Ford
M: +1 226-220-3401

Canada
Dean Zapishny
M: +1 519-494-3031

South Region
Ersin Yalcin
M: +1 404-435-4722

Central Region
Tony Schwegmann
M: +1 309-634-5276

West Region
Madison McLaughlin
M: +1 351-990-2888

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M:+46 708 68 70 23

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GEOSYNTEC FAMILY OF COMPANIES
HSE
Health, Safety, and Environment

Geosyntec consultants

Geosyntec HSE Procedures referenced herein are available on Geosyntec's HSE SharePoint site and should be consulted, as appropriate, to ensure requirements are met. This THA has been prepared per "*HSE STD-105, Project Safety Management Handbook*"

TASK HAZARD ANALYSIS

(Ver. 4.0, 9-8-2023)

Part A – PROJECT/TASK INFORMATION

Project/Site Name:	Camas Mill – Remedial Investigation	**Project Number/Org:**	AS130290L/02B
Site Address:	401 NE Adams Street, Camas, WA 98607		
Task & Worksite Description:	Geosyntec will conduct surface and subsurface investigation activities at an active paper production facility. The facility is located on the Columbia Slough and Columbia River.		

Geosyntec Personnel:	**Name**	**Office Phone**	**Cell Phone**
Site Safety Lead/Officer Task Technical Lead	Erin Dunbar	(971) 271-5916	(971) 469-3080
Project Manager	Cindy Bartlett	(971) 271-5895	(503) 505-4145
Project Director	Tim Flynn	(206) 780-7730	(206) 276-5540
Local HSE Coordinator	Madeline Solimano	(206) 499-6773	(206) 499-6773
Regional HSE Manager	Madison McLaughlin	+1 (858) 716-2900	(951) 990-2888
Corporate HSE Director	Bob Poll	(813) 379-4420	(813) 240-9231
On-Site Subcontractor(s): ☒ Not Applicable	☐ Applicable; provide company name, work task and contact information for each Geosyntec subcontractor below:		
Client, Contact(s):	Matt Tiller, director of remediation services	(404) 652-5243	(404) 216-6674
ETHICS POINT HOTLINE	US & Canada: 844-231-3371 UK: 800-89-0011 or 800-89-0011	Australia: 800-551-155 or 800.811.011 Ireland: 800-222-55288 or 800-500-000	

Part B - EMERGENCY RESPONSE and FIRST AID

IMPORTANT: After initial emergency response actions and incident stabilization, contact appropriate project staff and/or HSE personnel listed in Part A

Site-Specific Notes, Clarifications: On-site areas where facility operations have ceased ("static" areas) are generally considered accessible for purposes of field activities. Areas where facility operations continue and therefore conditions may continue to change due to ongoing operations ("dynamic" areas) are generally considered inaccessible for purposes of field activities. Developments in accessibility (e.g., condition change from dynamic to static) and sampling results will be discussed with Ecology, and field activities will be evaluated accordingly.

Emergency Communication / Alerting	☒ Verbal ☒ Cell Phone ☐ Land Line ☐ 2-Way Radio ☐ Satellite Phone ☒ On-site alarm/signal system ☐ Other:
To Summon Police, Fire, Ambulance	☒ **DIAL 911**, for external responders ☐ **Other**:
WorkCare *(for non-emergency injuries)*	**24/7: 888-449-7787**
Other Emergency Contacts *(such as security, spill responder, utility-related):*	N/A
Nearest EMERGENCY ROOM Medical Services	Hospital Name: Peace Health Southwest Medical Center Address: 400 NE Mother Joseph Place, Vancouver, WA 98664 Phone #: (360) 729-8370 ☒ **See ATTACHMENT A, ROUTE to HOSPITAL**
Emergency Evacuation - Route, Rally/Muster Point, Shelter Location(s)	Muster point shall be determined each day during the safety tailgate meetings given dynamic site conditions.

EMERGENCY and FIRST AID EQUIPMENT required for this work task is listed in **PART C.2. – SAFETY EQUIPMENT LIST**

Attachment Hospital A: Route to Hospital

PART C – HAZARD ANALYSIS and EQUIPMENT LIST *(Basis for Field Team Safety Orientations and Onsite Safety Discussions)*

C.1 ONSITE TASK HAZARD ANALYSIS

INSTRUCTIONS:

- Begin your job safety analysis by reviewing **"Pointers"** (see lower right) and completing ***Part D "HAZARD ANALYSIS AND CONTROLS*** for your TASK(s).
- In **Columns 1 & 2** (below), list/describe **TASKS & WORK ASPECTS** and the associated **HAZARDS & RISKS.**
- In **Column 3** summarize **CONTROLS & SAFE WORK PRACTICES** (Brief summary descriptions with references to THA Sections).

ALWAYS "COLLAPSE" THESE INSTRUCTIONS IN COMPLETED THA!

REFERENCES - Copy and paste, as applicable, into **Column 3:**

See C.2. SAFETY EQUIPMENT LIST
See D.1. BASELINE HAZARD PREPAREDNESS
See D.2. SPECIAL TRAFFIC/VEHICLE/TRANSPORT HAZARDS
See D.3. WATER HAZARDS
See D.4. FALL HAZARDS
See D.5. HAND TOOLS
See D.6. POWERED TOOLS & EQUIPMENT
See D.7. DRILLING
See D.8. CONSTRUCTION, HEAVY/LIFT EQUIPMENT
See D.9. STORAGE OF BULK MATERIALS
See D.10. ELECTRICAL WORK TASKS
See D.11. UTILITY-RELATED HAZARDS
See D.12. CONFINED/ENCLOSED SPACES
See D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS
See D.14. COMMERCIAL CHEMICAL PRODUCTS
See D.15. SITE CONTAMINANTS, CHEMICAL WASTES
See D.16. RADIATION HAZARDS (Other than Sunlight)
See D.17. HAZMAT/DANGEROUS GOODS SHIPPING.
See Part E AIR MONITORING, EXPOSURE MONITORING
See ATTACHMENT "X"

For POINTERS on completing a HAZARD ANALYSIS, see <HERE>

1. TASKS/WORK ASPECTS	2. HAZARDS/RISKS	3. CONTROLS / SAFE WORK PRACTICES
Mobilization/Demobilization	Routine work travel	See D.1. ROUTINE HAZARD PREPAREDNESS See D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS • Avoid cell phone use while driving • Obey all posted traffic signs and local laws • Demonstrate defensive driving • Plan route before beginning travel • Allow pedestrians the right-of-way • Familiarize with new area/site conditions
Employee(s) working over or near water	• Drowning • Hypothermia • Slips, trips and falls • Slippery surfaces	See C.2. SAFETY EQUIPMENT LIST See D.1. ROUTINE HAZARD PREPAREDNESS See D.3. WATER HAZARDS See E.2. OTHER WORKER EXPOSURE MONITORING • Employees must evaluate water conditions such as temperature or water current to select proper PPE. Example: dry suit and/or fall protection equipment. In addition, employees working within 4 feet of the water edge must wear a certified and properly sized U.S. Coast Guard personal floatation device (PFD). • Perform visual inspections of area noting potential overhead and other hazards that are not in the normal field of vision.

		• For work to be performed near water and more than four feet from the water's edge, erect sufficient barricades four feet away from the water's edge using traffic cones, plastic fencing, or cation tape to serve as a warning system when a worker unintentionally approaches the water's edge. • For work to be performed above water and/or within four feet of the water's edge, another worker who can immediately summon emergency rescue must stand guard. • At least one lifesaving skiff shall be immediately available at locations where employees are working over or adjacent to water • Prior to each use, the floatation device must be inspected for defects which would alter their strength, buoyancy, or fastening capability. Defective devices must be taken out of service immediately. • Employees must know how to use rescue equipment such as "pole & life hook or ring buoy" (Ring buoys with at least 90 feet of line shall be provided and readily available for emergency rescue operations). • Proper footwear with adequate traction must be utilized when working or walking on wet surfaces

4. ONSITE CHANGES, UNFORSEEN HAZARDS, THA "ADJUSTMENTS" (Recognized During Mobilization/Execution of Field Work)

Date:	Notes:
Date:	Notes:

C.2. SAFETY EQUIPMENT LIST (Gear to be brought to the worksite by Geosyntec personnel, or availability at the worksite confirmed)

Site-Specific Notes, Clarifications: Project is occurring during business hours at an active dry cleaner (clothes drop off only, no cleaning) and pizza restaurant. Will need to be mindful and/or block off work area from customers or employees during drilling or hammering.

☒	**WEATHER, CLIMATE, SEASONAL**	☐ Project-provided drinking water ☐ Canopy for shade, weather protection	☒ Sunscreen ☐ Ice creepers (boot attachments)	☐ Rock salt, traction sand ☐ Portable heater (electric or kerosene)
		☐ Other:		
☐	**HYGIENE PROVISIONS**	☐ Hand washing equipment (soap & wash water)	☐ Hand sanitizer, disinfectant supplies	☐ Sanitary facility, porta-toilet
		☐ Other:		
☒	**BASIC PPE**	☒ Standard work clothes appropriate for task ☒ Hard-toed boots/shoes ☒ Hardhat (as needed)	☒ Safety glasses ☒ Work gloves appropriate for task ☒ Noise/hearing protection (as needed)	☒ High-visibility/reflective vest/apparel ☒ Nuisance dust mask (voluntary use)
☐	**BIOLOGICAL HAZARDS**	☒ Insect/tick repellant--DEET, picaridin, other ☐ Permethrin-treated work clothing ☐ Pant-leg "blousing"/gaiters (tick safe) ☐ Tick removal kit ☐ Wasp/hornet spray, insect fogging device, other ☐ Poison ivy protection (Ivy Block skin cream, Tecnu skin wash)	☐ Animal warning device (for bears/cougars/wolves/large animals) ☐ Snake chaps/gaiters, bite/scratch-resistant gloves, other protective gear for animal hazards ☐ Hand sanitizer, hand washing supplies, personal hygiene supplies for infectious hazard control ☐ Disinfectant solution and related supplies to mitigate source of infectious hazard ☐ Masks, face covers, gloves, barriers, related gear to mitigate infectious hazard transmission	
		☐ Other:		
☒	**SPECIAL HAZARD CONTROLS**	☐ Portable GFCI(s) for shock protection ☐ Electrical-hazard-rated boots, gloves ☐ Arc-resistant (AR) protection PPE for arc flash ☐ Flame-resistant (FR) clothing ☐ Work-area delineation supplies	☐ Lockout/tagout equipment ☐ Portable lighting ☐ Tripod/winch ☐ Ventilation equipment (fan, blower) ☐ Traffic control devices	☐ Personal fall protection apparatus ☒ Personal flotation device ☒ Ring buoy & rope ☐ Marine survival suit
		☐ Other:		
☒	**CHEMICAL PPE and CHEMICAL SAFETY GEAR**	☐ Goggles and/or face shield ☒ Chemical protective gloves ☐ Coveralls (Tyvek, or other) ☐ Outer boots, boot covers	☐ Disposable N95 respirator ☐ Half-face respirator (APR), cartridges ☐ Full-face respirator (APR), cartridges ☐ Exclusion Zone delineation supplies	☐ Decon solution, related supplies ☐ Receptacle for disposable PPE ☐ **Chemical hazard emergency gear – listed in "EMERGENCY EQUIPMENT" below**
		☐ Air monitoring equipment, worker exposure monitoring device(s):		
		☐ Other:		
☒	**EMERGENCY EQUIPMENT**	☐ **Air horn, alarm, alerting equipment** ☐ **2-Way radios; other communication device** ☒ **First aid kit(s) – onsite and/or in vehicles** ☒ **Fire extinguisher – onsite and/or in vehicles**	☐ **Eyewash bottle(s)** ☐ **15-min. eyewash station** ☐ **Emergency deluge shower** ☐ **Chemical spill kit/supplies**	**Vehicle emergency preparedness:** ☒ **Fire extinguisher, first aid kit** ☐ **Flares, lights, reflective device** ☐ **Roadside assistance service**
		Other:		

PART D – HAZARD ANALYSIS AND CONTROLS *(Site-Specific Safety Analysis & Information)*

D.1. "BASELINE" HAZARD PREPAREDNESS (This section applicable to ALL Tasks, covering natural hazards, driving/travel, basic safety & PPE)

a. Weather/Climate/Altitude Hazards

☒ **Heat stress** – Prevent heat-related illness; At ambient temps > 80ºF (27ºC) **use Geo HeatTracker to assess hazard**, implement mitigations accordingly.

☒ **Cold stress** – Prevent frostbite, hypothermia; multiple clothing layers, keep clothing dry, protect exposed skin, stay hydrated, frequent warming breaks.

☐ **Sunburn, conjunctivitis** – Sun blocker, shade canopy, wide-brimmed hat, long sleeves/pants; protect eyes from glare near water/snow/sand

☐ **Extreme weather** – Track weather, emergency plan: ID shelter/refuge, use weather app for lightning prediction at 10 mi./16 Km (use "30/30 rule" as backup).

☐ **Weather-related conditions** – Use appropriate precautions for ice/snow/slippery conditions, flood, mold, soft ground, downed trees/wires, fire hazards, other.

☐ **Acute Mountain Sickness (AMS)/Altitude Illness** – for work to be performed at ≥ 8,000 feet (2,450 meters) above sea level, see *THA Addendum on AMS.*

Site-Specific Notes:

HSE Program Documents, *HSE SOP-409: Heat Illness Prevention*, *HSE SOP-410: Cold Stress Prevention*

b. Biological Hazards

☒ **Insect/tick/arthropod hazards/vector-borne disease** – Use insect repellant, permethrin-treated clothing/gear, tick checks, tuck pants/shirt, tick removal tool, wasp spray, bug zapper/trap, mosquito netting, fogging, other barriers and protective devices, habitat treatment/removal, as applicable.

☒ **Plant hazards** – Know the hazards (e.g., poison ivy/oak/sumac, giant hogweed, poison hemlock, nettles, etc.), know the precautions for site habitat: barrier ointments, washes; long sleeves/pants, gloves, remove plants (avoid burning), launder work clothes (hot water/detergent), clean tools (alcohol or soap/water).

☐ **Animal hazards** – Know the hazards/precautions for work site: avoidance, repellants, PPE, warning devices, habitat/food source removal, infection controls.

☐ **Common unsanitary/allergenic hazards** – Use routine hygienic measures/precautions; hand washing/sanitizer, food hygiene, PPE, disinfectant cleaning.

☐ **Infectious/pathogenic** - For site-specific infectious hazards (viral, bacterial, bloodborne pathogens, mold, other), see **D.13 "Infectious/Pathogenic Biohazards."**

Site-Specific Notes:

HSE Program Documents: *HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants*,

c. Routine Driving Hazards

☒ **Routine work travel** – Use routine safe/defensive driving practices (seat belts, safe speeds, eyes ahead, no tailgating, limit distractions, safe cell phone use, no texting, clear windows, account for weather/road conditions, adequate sleep, other measures as appropriate).

☒ **Unfamiliar location** – Before driving in roadway: view map, note key benchmark locations, plot your route and/or enter destination into navigation device.

☒ **Unfamiliar vehicle** – Before driving in roadway: become familiar with vehicle controls; adjust seat, mirrors, vents, heat/AC, audio, lights, check brakes.

☐ **Fatigue** – Minimize fatigue during long drives: frequent rest breaks, muscle stretches, eat light snacks-avoid heavy meals, stay hydrated, fresh air, no loud music, clean windshield; avoid/minimize long distance driving during your ordinary sleep hours; total *work time* and *drive time* should not exceed 14 hours per day.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-220: Fatigue Management*, *HSE SOP-605a: Driver Authorization Program*

d. General Safety

☒ **General premises hazards** – Prevent slips/trips/falls (resulting from rough terrain, trip hazards, steep slope, slippery surfaces); maintain good housekeeping, be aware of on-site structures, utilities, overhead hazards, uneven/hazardous surfaces, obstacles, onsite traffic, restricted access/workspace.

☒ **Musculoskeletal hazards** – Prevent strains/sprains from strenuous tasks, overexertion, repetitive motion/ergonomic/lifting (seek help/lift-aids over 49 lbs.)

☒ **Worksite traffic hazards** – Implement measures to protect personnel (high-visibility/reflective clothing, on-person lighting, traffic control measures).

☐ **Hazardous energy** – Use caution near electrical equipment/wet locations, machinery/physical hazards, stay out of hazard zone/line-of-fire, do not touch.

☐ **Illumination hazards** – Illuminate work areas and/or access routes, use high-visibility and reflective clothing or on-person lighting, as appropriate.

☐ **Security: high potential for crime/workplace violence/security breach** – Complete a *Risk Assessment for Working in High-Crime, High Security Risk Locations*

☐ **Working alone –** Communicate a project-specific lone-work plan to coworkers, including procedures for periodic communication/contact.

Site-Specific Notes:

HSE Program Documents: *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*, *HSE SOP-210: General Housekeeping*, *HSE SOP-401: Lone Working*, *HSE SOP-403: Management of Traffic*, *HSE SOP-616: General Safety Rules*

e. Basic Personal Protection

☒ **Head protection from overhead hazards** – Wear hardhat or "bump cap" as appropriate for hazard.
☒ **Hand protection** – Wear gloves to protect from physical, chemical, and biological hazards; select glove type (or types) specific for the task & hazard(s)
☒ **Eye protection** – Wear safety glasses (with side shield or wrap around, either clear or shaded for sun protection), or other appropriate eye protection.
☒ **Foot protection, rough terrain** – Wear work boots/shoes with hard toes, ankle support, puncture resistance, traction, as appropriate for conditions.
☒ **Hearing protection** – use earplugs or earmuffs (or both) as appropriate for conditions; at a minimum where noise levels exceed 85 dBA.
☒ **Protective clothing/nuisance dust mask** – For general protection against dust, dirt, oily residues, unsanitary conditions, as needed.
☐ **Other personal protective gear** for task(s) covered in this THA is described in respective sections of this THA in Site-Specific Notes & Clarifications

Site-Specific Notes:

HSE Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-135: Hearing Protection Program*

D.2. SPECIAL TRAFFIC / VEHICLE / TRANSPORTATION HAZARDS ☒ Applicable ☐ Not Applicable, Not Anticipated

(For water-transportation hazards, see D.3. "Water Hazards"; For construction traffic hazards, see D.8. "Construction, Heavy Equipment, Lift Equipment")

Site-Specific Notes & Clarifications:

☒	**THOROUGHFARE TRAFFIC HAZARDS** Where the worksite is located in/near vehicle thoroughfare (road, highway, parking lot, etc.). Hazards: Injury to worker and general public from collision involving moving vehicle.	☐ Prepare Management of Traffic (MOT) Plan (address location hazards / client and regulatory requirements). ☒ Wear DOT-approved reflective vests where exposed to traffic hazards. ☒ Where possible, park vehicles as protective shield from oncoming traffic. ☒ Configure work area and support vehicles to minimize worker exposure to traffic hazards. ☐ Use DOT signal devices and/or signage to re-route vehicles around work area, site entrances/exits. ☐ Use DOT-trained flaggers or police detail where appropriate or required. ***HSE Program Documents:*** *HSE SOP-403: Management of Traffic*
☐	**SPECIAL VEHICLE HAZARDS** Off-Road Driving or use of non-typical vehicle, heavy vehicle, work truck, van, UTV/ATV Hazards: Worker injury due to vehicle collision, rollover	☐ For off-road driving, do not exceed capability of vehicle, beware of wet conditions, keep speed low, avoid unsafe orientation on slopes. ☐ UTV/ATV-specific procedures for training, use rollbar or helmet, operate per manufacturer's instructions. ☐ Special Skills Required for Vehicle type – For vehicles requiring special skills (such as windowless van, heavy work vehicle, utility vehicle, similar) ensure operator is provided training and/or has appropriate operator skills through experience. ***HSE Program Documents:*** *HSE SOP-652a-Utility Vehicles (US-only) (safe operation of mobile equipment)*
☐	**TOWING/HAULING LOADS** Hazards: Vehicle accident, occupant injury from shifting load, unsafe equipment, un-roadworthiness of trailer and/or vehicle.	☐ Ensure load within vehicle is firmly secured (rope, straps, load configuration) to prevent shifting during travel. ☐ Slings, chains, strap, rope, and related equipment used for towing, hauling, load-securing shall be appropriate for use, and used in a manner as to prevent an unsafe condition (generally, bungee cords not appropriate). ☐ For trailer use, verify tow-hitch components are compatible, hitch/safety chains secure, signal/braking lights operational, rear-view mirrors effective, tires inflated to proper pressure and tread acceptable.
☐	**RAILROAD RIGHT-OF-WAY HAZARD** Hazards: Struck by train in R.R. right-of-way; electrical shock from third rail or overhead electrical lines	☐ Coordinate with rail company or on-site host facility and implement required safety and security measures. ☐ Site workers shall receive safety training/certification (per railroad owner/operator) for railroad work.
☐	**AIRPORT HAZARDS** (on the ground) Hazard: Injury due to proximity on/near airport runway, flight path.	☐ Coordinate safety requirements with airport personnel and implement required safety measures. ☐ Site workers shall receive safety training/certification (per airport owner/operator) for airport work. ***HSE Program Documents:*** *HSE SOP 628: General Aviation (Small Aircraft) Safety*
☐	**LIGHT AIRCRAFT/HELICOPTER USE** Hazards: Injury from collision during taxi/take-off/landing, aircraft crash and related general aviation hazards	☐ Review certifications/licenses/experience of pilot, airworthiness certificate for aircraft, safety practices of operator, aircraft safety rating, safety equipment/provisions on aircraft. ☐ Passengers shall adhere to general passenger safety practices, and requirements of owner/operator/pilot. ☐ For transport of HazMat/Dangerous Goods, see **D.17., "Transport/Shipping of Hazmat/Dangerous Goods"** ***HSE Program Documents:*** *HSE SOP-628-General Aviation, Small Aircraft Safety*
☐	**USE OF AERIAL "DRONE"** Hazards: Airspace interference, collision with ground personnel, general public, infrastructure.	☐ For use of aerial drone--a.k.a. *small unmanned aerial system* (sUAS), *remote piloted aircraft* (RPA) or *unmanned aerial vehicle* (UAV)--review/adhere to requirements for regulatory certifications, authorizations & approvals, and pre-mob planning for pre-flight-, in-flight-, and post-flight checks, and unplanned events. **HSE Program Documents:** HSE MAN-003a: Unmanned Aerial Systems Manual (U.S. Only)

D.3. WATER HAZARDS (Working Over/On/Near Water, Ash Ponds, Quicksand, Soft Ground) ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: Sampling may require working near or wading into slough.

☒ **WATER HAZARDS**

Work/travel in watercraft or on equipment over water or over coal ash impoundment/pond:
- ☐ Workboat, barge, over-water structures
- ☒ Water transportation
- ☐ Hazardous currents (river, tidal/riptide)
- ☐ Towing, trailer, roadway
- ☐ Other – describe above

Walking/wading into water, on shoreline, riverbank, dock, bulkhead, abutment, coal ash:
- ☒ Wading/walking into/near water, wetland
- ☐ Hazardous tidal zone or surf
- ☐ Water release, flash flood
- ☐ Coal ash pond, quicksand, soft ground
- ☐ Open culvert, arroyo, drainage/irrigation ditch
- ☐ Ice hazard on or near waterbody

Diving
- ☐ Scientific SCUBA diving

Hazards (as applicable):
- Drowning, cold immersion
- Boating collision, navigation, fog, darkness
- Fire/fuel hazards
- Entrapment (mud/silt/coal ash/quicksand)
- Slip/fall hazards – ice, mud, silt, wet surfaces
- Weather, heat/cold stress
- Equipment failure, hypoxia
- Chemical contaminant and/or biological hazard

General water-safety measures for all work near water:
- ☒ Wear regulatory-approved personal flotation device (PFD) where drowning hazard is present.
- ☒ Bring emergency rescue and/or signaling equipment (ring buoy and rope, reaching device, flares)
- ☐ For fall protection over water, see **D.4. "Fall Hazards."**
- ☐ For electrical hazards associated with water/wet locations, see **D.10. "Electrical Work Tasks."**

Boating-specific:
- ☐ Use fuel safety practices, fire extinguisher present in boat.
- ☐ Develop/follow float plan, monitor weather, navigate/communicate as planned.
- ☐ Confirm navigation/communication equipment operable before heading onto water.
- ☐ For work over very cold water, have immersion survival suit available.
- ☐ For tidal, flash flood, dam release hazards, plan/locate work accordingly.
- ☐ For towing a boat trailer, see **D.2. "Special Driving/Traffic/Transportation Hazards."**

Wading in water or walking along shore/bank or on dock/pier/abutment:
- ☐ For ice/slip hazards, wear ice creepers, sand work area, use tether, other appropriate measures.
- ☒ For work on ice over water, verify safe thickness, have ring buoy & rope available
- ☒ For unsure/slippery footing in water, use wading staff, high-traction soles on waders.
- ☐ Have lifesaving skiff/boat available in circumstances where other rescue means are inadequate.
- ☒ Monitor hazardous tides, weather for flash floods, know water release schedule.

For soft ground, ash ponds, quicksand:
- ☒ Wear personal flotation device (PFD), as appropriate for the work task and work environment.
- ☒ Bring emergency rescue equipment (ring buoy and rope, reaching device)
- ☐ If walking on ash/quicksand, provide stable walking/working surface (4'x8' plywood, or similar)

For diving:
- ☐ Develop a diving safety plan approved by Geosyntec's diving coordinator

For chemical contaminant and/or biological/infectious hazard:
- ☐ See **Section(s) D.1.b., "Biological Hazards**, **D.13., "Infectious/Allergenic Biohazards," D.14., "Commercial Chemical Products," and/or D.15., "Site Contaminants, Chemical Wastes"**

HSE Program Documents: *HSE SOP-407: Working On/Near Water and Ice, HSE SOP-630: Water Transportation Safety, HSE MAN-005: Underwater Diving Operations Manual*

D.4. FALL HAZARDS (Falls to Lower Levels) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐ **WORKING AT HEIGHTS (GENERAL)**

Hazards:
- Injury from falls onto lower surface or falls into hazardous equipment, chemicals, water
- Overhead utilities/obstructions
- Impalement hazard (such as from falling onto unprotected rebar and similar surface projections)
- Hazard posed to ground personnel from falling tools, equipment, materials

Fall protection "trigger heights":
Built environment *– US & CAN: 4 ft. (1.2 m.);* ***Construction:*** *US: 6 ft., 10 ft. for scaffolds; CAN: 10 ft. (3 m)*

Protect from ***primary*** (fall) hazards:
- ☐ Restrict access to hazard (barriers, tape, sign)
- ☐ Ensure safe access to height (ladder, stair, lift)
- ☐ Ensure guardrails/stair-rails/handrails present
- ☐ Ensure covers in place over holes
- ☐ Use designated "watch person/monitor"
- ☐ Use tether or positioning device
- ☐ Use personal fall apparatus (PFA)
- ☐ Use fall protection net

Protect from ***secondary*** (collateral) hazards:
- ☐ Protect site ground personnel from falling objects (restrict access, toe-boards, tether tools)
- ☐ Install caps on protruding rebar and similar
- ☐ Working over water; see **D.3, "Water Hazards"**
- ☐ Working over hazardous machinery/equipment; see **D.6, "Power-Tools/Powered Equipment"**
- ☐ Overhead electrical; See **D.11. "Utility-Related Hazards"**
- ☐ Working over chemical hazards; See **D.14 and/or D.15 for chemical and/or contaminant hazards.**

HSE Program Documents: *HSE SOP-405: Walking-Working Surfaces Protection, HSE SOP-415a: Fall Protection (North America-only), HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

☐ **LADDER / STAIRS**
- ☐ Extension/straight ladders
- ☐ Step ladders
- ☐ Fixed/installed ladders
- ☐ Portable/mobile stairs
- ☐ Job-made or scaffold stairs

Hazards:
- See general fall hazards, above.

☐ Follow safe work practices:
- Use ladders according to safe practices and manufacturer's instructions.
- Maintain 3 points of contact at all times on ladder; keep center of gravity within side rails.
- Do not use metal (conductive) ladder near electrical hazard.
- Extension/straight ladders shall be properly footed, secured, angled, extend above upper work surface.
- Stepladders are set on level ground or properly shimmed, spreaders locked; do not climb/stand on top step, top cap, or rear non-climbing side; use step ladder of sufficient reach height for work.
- Equip stairs with stair handrails where more than 4 steps, and for stairway height of 4' or more.
- Ensure portable stairs are stable, plumb, and of sufficient reach height for task.

HSE Program Documents: *HSE SOP-415a: Fall Protection (North America-only); HSE SOP-638: Ladders and Stairways*

☐	**SCAFFOLD** ☐ Supported scaffold ☐ Suspended scaffold ☐ Free-standing/mobile scaffold Hazards: - See general fall hazards, above - Equipment collapse	☐ Follow safe work practices: • Identify/coordinate operations with the scaffold "Competent Person." • Supported scaffold level, stable, proper attachments, tiebacks, planking, • Suspended scaffolds anchored properly. • Guardrails or personal fall apparatus required above 10 feet. • Proper means of accessing scaffold (proper ladders, stair tower); do not climb scaffold frames. • Total height of free-standing scaffold shall not exceed four times the minimum base dimension. • Do not exceed load limits, distribute loads evenly, stage materials in quantities sufficient for immediate use. ***HSE Program Documents:*** HSE SOP-648: Scaffolds
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - See general fall hazards, above - Struck-by, run-over, tip over - Caught between (pinch points) - Fluid leaks/fuel hazards or battery-related hazards	☐ Follow safe work practices: • Operators shall be trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn whenever operating a boom lift (optional for scissors lift). • Overhead hazards and surface obstructions shall be reviewed with operators prior to use. ***HSE Program Documents:*** *HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)*
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11., "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.5. HAND TOOLS (Manual, Hand-Powered) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**MANUAL HAND TOOL INJURIES** ☐ Struck by ☐ Pinch points/crushing injuries ☐ Puncture ☐ Cutting blade/laceration risk ☐ Flying objects, eye hazards ☐ Other, describe above	☐ Proper tool for the job, maintain in good condition, use vise/clamp to hold work piece, proper follow through, Self and nearby personnel shall stay clear of "line of fire," use appropriate work gloves, keep blades sharp, use wrist strap when dropped tool poses a hazard. ☐ Utility/folding/collapsible knives and fixed-blade knives/cutting tools are *not* permitted, unless specifically authorized. Cutting tools with auto-retracting blades, or with enclosed/guarded blades are permitted. Use cut-resistant heavy work gloves, as applicable. ☐ Ground surface penetration (hand auger, probe) – requires utility clearance; see **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-640: Manual Hand Tools*
☐	MUSCULOSKELETAL (MSK) HAZARDS ☐ Risk of acute physical MSK trauma (strains, sprains, soft tissue injuries) ☐ Risk of cumulative/chronic MSK trauma, repetitive motion injuries	☐ For tools requiring high exertion (shovel, hand auger, sledgehammer, pickaxe, slide hammer, similar): do stretching exercises to prepare, clear hazard zone, use stable body position, take rest breaks, avoid overexertion. ☐ For recognized musculoskeletal hazard, acute or chronic, resulting from unsafe acute exertion, or ergonomic/repetitive motion/cumulative trauma risks, seek advice on controls **from Corporate HSE Dept**. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.6. POWERED TOOLS & EQUIPMENT (For Drilling & Heavy Equipment, see D.7 & D.8) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**Type of powered tools/equipment:** ☒ "Power tools" ☐ Powered portable equipment ☐ Powered fixed equipment **Energy/power source:** ☐ DC battery- or solar-powered ☐ AC electric-powered ☐ 120V ☐ 240V ☐ 480V ☐ Extension/flexible cords ☐ Fuel-powered (gas or liquid) ☐ Pneumatic ☐ Hydraulic ☐ Gunpowder-actuated **Hazards of Power Tools and Powered Equipment:** ☐ Eye/hand/body injury ☐ Point-of-operation hazards ☐ Pinch points, moving parts	☐ General safe work practices for operation of powered tools and equipment: • Inspect before each use to ensure safe operating condition. • Clear personnel from hazard zone; keep personnel out of the "line-of-fire;" heed warning labels/signage. • Arrange worksite for safe access to equipment and sufficient work area clearance for safe use of tool; confirm no overhead obstructions; ensure adequate illumination. • Secure long hair/loose clothing/hanging jewelry near moving/rotating parts. • Ensure point-of-operation, mechanical power transmission, other moving parts are guarded with protective devices (as applicable); do not override interlocks, guards, protective devices. • Do not make any equipment modifications that create a greater hazard or bypass safety design features. • Use tool/equipment in accordance with manufacturer's use and safety instructions. • Use PPE and/or other safety protections, as appropriate, for eye/hearing/hand/head/body protection. • Provide training or verify operator competency for use of power tool/equipment. • Use ventilation, wet methods, respirators, other applicable means to mitigate inhalation hazard. • Move power cords/pressurized hoses to protect them from damage during tool/equipment use. • For spark/heat generating tool/equipment, have fire extinguisher available, remove combustible/flammable materials, or use other means to control fire hazard (e.g., fire watch, fireproof blanket). • Use safe lifting practices and/or lift aids for moving heavy portable equipment, and use safe operating procedures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. • Implement safe work practices for compressed air, pressurized systems (pneumatic/hydraulic), stored energy. ☐ Additional requirements for power tools: • Use vise/clamp/work bench or other means to hold/secure a portable/moveable work piece. • Do not carry electrical tools/equipment by the power cord; do not carry pneumatic tools by hoses. • Disconnect tool/equipment from power source before changing bits, blades or making adjustments.

	☐ Line-of-fire hazards, struck by ☐ Fire/explosion, ignition sources ☐ Burns from hot surfaces, steam ☐ Noise ☐ Inhalation/atmospheric hazards ☐ Working at heights, falls ☐ Overhead obstruction(s) ☐ Musculoskeletal hazards ☐ Potential (stored) energy ☐ Illumination	☐ Additional requirements for fixed powered equipment: • Implement lockout/tagout controls for repairs/adjustments/tooling changes. • Equip pneumatic hoses with whip checks; ensure factory fittings are used for high-pressure hose connections. ☐ For climbing/fall hazards associated with large equipment, see **D.4. "Fall Hazards."** ☐ For electrical hazards, see **D.10. "Electrical Work Tasks."** ☐ For ground surface penetration, see **D.11. "Utility-Related Hazards."** ☐ For fuel-safety practices, see **D.14. "Commercial Chemical Products."** ☐ For air monitoring of atmospheric hazards, see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**WELDING, CUTTING, HOT WORK** ☐ Arc-welding (electrical arc) ☐ Gas-welding/cutting (fuel gases) Hazards: - UV/IR light-eye/skin burns - hot-work hazards/fire - toxic metal welding fumes - compressed gases (physical hazards, fire, oxygen deficiency) - electrical shock	☐ General safe work practices for operators of welding equipment: • Hot work permit system shall be implemented. • Operator properly protected (eye protection, clothing, apron, etc.). • Fire hazard controls (watcher, fire extinguisher, water, remove combustibles from work area). • Protect nearby personnel from hazardous UV, IR light (shielding, curtain); see **D.16. "Radiation Hazards."** ☐ For welding gas cylinders, secure them upright with caps on when stored or not in use; protect cylinders from damage; NEVER secure gas cylinders to metal welding bench used for electrical arc welding; see **D.14. "Commercial Chemical Products."** ☐ For arc welding, follow electrical safe work practices; see **D.10. "Electrical Work Tasks."** ☐ For inhalation hazards from welding fumes (toxic metals) and gases (asphyxiant, flammable), see **D.14. "Commercial Chemical Products."**
☐	**PORTABLE ELECTRIC GENERATOR** Hazards: - Electrical shock - Carbon monoxide inhalation hazard - Fuel-related fire hazard - Injury from mechanical or lifting hazard - Burns from hot surfaces	☐ Follow general safe work practices for Powered Tools & Equipment (above), and as follows: • Use in accordance with manufacturer's instructions, including instructions for grounding the generator. • Keep generator and work area dry. • Never use indoors, or near building air intake vents due to carbon monoxide hazard. • Provide for ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Use hearing protection in close proximity to operating generator (where noise level exceeds 85 dBA). • Use power cords/extension cords specified by instructions. • Use ground-fault circuit interrupters (GFCIs) in accordance with manufacturer's instructions; see **D.10. "Electrical Work Tasks."** • Shut down equipment before refueling; see safe practices for flammable/combustible liquids in **D.14. "Commercial Chemical Products."**
☐	**PNEUMATIC / HYDRAULIC HAZARDS** ☐ Air compressor ☐ Compressed air system ☐ High-pressure liquid ☐ Pressurized steam (For compressed gas cylinders, see **D.14. "Commercial Chemical Products")**	☐ Never direct outlet nozzle toward body; use guards, restraints, engineering controls as appropriate. ☐ Never use compressed air for cleaning clothes you are wearing. ☐ If compressed air is used for cleaning, restrict pressure to 30 psi or below, equip nozzle with chip guard. ☐ Use PPE for eye (goggles or face shield)/hand/head/hearing/skin protection, as appropriate for the hazard. ☐ Ensure tank, hoses, fittings are in good repair using factory fittings, equipped with whip-checks. ☐ If pressure relief device poses a hazard to workers, reconfigure or shield device or restrict access by workers.
☐	**PORTABLE HEATER** ☐ electric ☐ fuel-powered Hazards: - Shock (electrical) - Carbon monoxide emissions and fuel-related fire hazards (fueled) - Fires/burns from hot surfaces.	☐ Follow general safety practices for Operation of Equipment/Machinery (above), and as follows: • Keep heater dry and locate heater on level surface away from high traffic areas to prevent tipping. • Never use fuel-powered heaters indoors, or near air intake vents, due to carbon monoxide hazard. • Provide ventilation and/or air monitoring where hazardous accumulation of exhaust emissions is possible. • Keep combustible materials at least 3 feet from hot surfaces. • Plug electric heaters directly into wall outlet (do not use extension cord or power strip). • For electric heaters, see **D.10., "Electrical Work Tasks."** • Shut down fuel-powered equipment before refueling; see safe practices for flammable/combustible liquids and/or compressed gases in **D.14. "Commercial Chemical Products."**
☐	**LOCKOUT/TAGOUT (LO/TO) OF HAZARDOUS ENERGY** To prevent unplanned equipment start-up or release of energy when under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
	HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-135: Hearing Protection Program, HSE STD-150: Globally Harmonized System for Hazard Communication (for fuel), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-452a: Lock-out/Tag-out (North America-only), HSE SOP-454a: General Electrical Safety (US-only), HSE SOP-642: Powered Hand Tools; HSE SOP-654: Welding, Cutting and Other Hot Work*	

D.7. DRILLING (Test Boring, Direct Push, Construction Drilling) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**DRILLING & DIRECT PUSH** Includes hazards posed by drilling rig and associated equipment, heavy support vehicles, trailer/towing hazards, and similar mobile equipment. Hazards: - Struck-by equipment - Run over, roll-over - Caught between (pinch points) - Manual lifting, musculoskeletal - Fuel/fluid leaks, fuel hazards - Suspended equipment - Roadway hazards	☐ Follow safe work practices, as applicable: • Non-drilling personnel shall stay clear of drilling work zone when drill rig in operation. • Equipment shall be maintained in good repair, inspected daily upon mobilization; backup alarms and emergency stop operational, machine guards in place, whip checks on high pressure lines. • Leaks or defective safety equipment will be repaired before use. • Establish eye contact with operator and use hand signals prior to approaching the rig. • Use PPE near operating rig (eye/head/hearing/hand/foot protection, high visibility vests or equivalent). • Arrange personal/support vehicles to protect drill team and not obstruct travel lanes or other operations. • Operators/helpers must maintain safe distance from moving parts; secure loose hair/clothing, equipment. • Drill rigs will only be moved with masts lowered. • Maximum safe slope for rig will be followed, drill rig leveled, appropriate blocking/cribbing as needed. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Ventilate exhaust and conduct air monitoring, as appropriate, when drilling indoors. • Never climb drill mast without appropriate fall protection. • Use precautions for overhead and underground utilities.
☐	**MECHANICAL LIFTING, RIGGING** Applies to lifting truck-mounted boom rig (e.g., drill rig), and all other drilling-related mechanical/electrical hoist equipment. Hazards: - Mechanical hazards - Elevated loads	☐ In addition to general drilling & direct push safety practices (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom, and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-430: Drilling Activities, SOP-434a: Overhead and Underground Utility Hazards (US-only),* HSE SOP-644: Working Around Heavy Equipment,

D.8. CONSTRUCTION, HEAVY EQUIPMENT, LIFT EQUIPMENT ☒ Applicable ☐ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications: The site is considered an active site

☒	**WORKING NEAR MOBILE HEAVY EQUIPMENT, ON-SITE VEHICLES** Hazards: - Struck-by - Caught between - Run over, roll over - Overhead hazards/obstructions - Elevated loads	☒ For personnel on-foot/on-the-ground near operating heavy equipment, follow safe work practices: • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Maintain unobstructed vision: wear shaded eyewear only in bright sun; do not wear hoods. • Erect barriers and post signs to identify and isolate the equipment hazard zone, if possible. • Stay out of swing radius of equipment, both in front and operating end, as well as at the back of equipment. • Stay out of the travel path of operating heavy equipment. • When crossing vehicle pathway behind moving equipment, cross at a distance not less than 30 feet. • When approaching equipment, always be able to see operator so he/she can see you. • Make eye contact with operator and use hand signals or make radio contact prior to approaching equipment. • Operator shall provide "all off" hand signal when it is safe to approach within swing radius of equipment.
☐	**OPERATION OF MOBILE HEAVY EQUIPMENT** Hazards: - Struck-by - Run over, roll over - Caught between (pinch points) - Fluid leaks/fuel-/fire-hazards - Overhead hazards/obstructions - Potential for body entrapment/crushing - Rotating equipment, moving parts.	☐ Operators shall follow safe work practices for operation of heavy equipment: • Only trained/qualified persons allowed to operate heavy equipment. • Wear seat belts; roll-over protection system present/deployed; do not exceed maximum safe slope. • No passengers on moving/operating equipment except where passenger seat/restraint is present. • Equipment inspected daily upon mobilization; maintained in good repair, backup alarms, windows clear. • Leaks or defective safety equipment should be repaired before use; fire extinguisher present. • Maintain eye contact with ground personnel and use hand signals to direct their approach near equipment. • High visibility vests for all personnel in construction vehicle work area, on-site roadways and travel lanes. • Cease operation if personnel enter swing radius, travel path or hazard zone of moving parts, elevated loads. • Use safe practices for fuel handling/storage/transport; spill equipment available for fuel/fluid leaks. • Equipment locked, secured, brakes set, buckets/forks lowered, extendable parts retracted, when not in use. • Shut down/lock out equipment to prevent crush situation beneath or between moving parts of equipment. • Ensure personal/support vehicles are parked/located to not obstruct equipment travel lanes/operating zones. • Mark temporary roadways clearly, provide berms/stops where needed. ***HSE Program Documents:*** HSE SOP-644: Working Around Heavy Equipment
☐	**TRENCHING/EXCAVATION** Hazards: - Cave-in, entrapment - Hazardous atmosphere - Water accumulation - Falls into excavations	☐ Safe work practices when personnel will enter trenches/excavations: • Activities under supervision/oversight of Competent Person, conduct daily inspection of excavation. • Excavated materials placed at least 2' from trench sidewall. • Prevent water accumulation in trench. • Sloping & shoring for trenches/excavations >20' deep must be approved by a Professional Engineer.

	- Utility-related hazards - Undermining structures & foundations	• Sloping/shoring/trench box for excavations >5' when persons enter trench/excavation. • Sloping/shoring/trench box for shallow (<5') trench/excavation with cave-in hazard. • Workers in trenches shall be within 25 feet of ladder or sloped entryway. • Excavations shall be protected by perimeter fencing (not barricade tape) if potential for personnel to fall into. • If potential for atmospheric hazard, see **D.12. "Confined/Enclosed Spaces"** ***HSE Program Documents:*** HSE SOP-432: Excavation and Trenching Activities
☐	**FORKLIFT** Hazards: - Struck-by - Run over/roll over/tip over - Overhead utilities/obstructions - Caught between (pinch points) - Unstable/falling loads - Elevated forks - Fluid leaks	☐ In addition to general safety practices for heavy equipment (above), as applicable: • Qualified operator, per established forklift training (certificate is required); Geosyntec operator must be approved by Director of Health and Safety. • Equipment inspected daily and documented on Forklift Preoperational Inspection Checklist. • Do not exceed lifting load limits. • Forklift shall not be moved/driven with empty forks in raised position. • When not in use, forks lowered, brake set, controls in neutral, key removed. ***HSE Program Documents:*** HSE SOP-436: Safe Operation of Forklifts and Mobile Equipment
☐	**AERIAL BOOM/SCISSOR LIFT** Hazards: - Falls from basket - Overhead utilities/obstructions - Struck-by, run over, tip over - Caught between (pinch points) - Tip over - Fluid leaks	☐ Follow safe work practices: • Operators shall be appropriately trained and certified. • Equipment is inspected after mobilization and is in good condition. • Harness & lanyard worn when operating a boom lift (optional for scissor lift). • Overhead hazards and surface obstructions shall be reviewed with operators/riders prior to use. ***HSE Program Documents:*** HSE SOP-650: Manlifts and Aerial Lift Platforms (safe operation of mobile equipment)
☐	**CRANES** Hazards: – electrocution by overhead utility – injury in swing radius – injury from falling load – crane tipping over due to overbalancing, high winds, unstable ground, unsafe slope, bad placement of outriggers – injury from mechanical hazards	☐ In addition to general safety practices for Operation of Heavy Equipment (above), as applicable: • Only qualified persons operate cranes (certificate required). • Critical Lift Plan & Checklist prepared/executed (See Procedure) prior to mobilization. • Equipment shall be inspected prior to mobilization and daily by crane operator. • Crane operator will remain at the controls at all times during operation. • Crane operation must be performed under the direction of an appointed signal person at all times using hand signals and/or voice/radio communication. • Crane shall be level and stable (solid ground or crane mats/timbers, outriggers if present, cribbing); over-reaching or exceeding load limits is prohibited. • Keep area beneath suspended loads clear of personnel; tag lines used to maneuver load. • Rigging procedures – see Mechanical Lifts with Rigging, below.
☐	**MECHANICAL LIFTS WITH RIGGING** Applies to lifting by rigging attached to crane, truck-mounted boom rig (e.g., drill rig), heavy equipment, mechanical/electrical hoist, similar equipment. Hazards: – Mechanical hazards – Elevated loads	☐ In addition to general safety practices for Operation of Heavy Equipment and Cranes (above), as applicable: • Slings, chains, rope, wire rope, as well as sheaves, boom and attachments used for lifting/hoisting shall be maintained in good condition, inspected daily, and used/stored in a manner as to protect from damage. • Coordinate lifting operations with competent person. • Do not exceed loading limits of lifting equipment; perform work in accordance with equipment load chart. • Hooks will be equipped with safety latches. • Ensure anchor points for winch or other lift device (such as davit arm) are engineered for intended use. • Ensure personnel are not positioned beneath elevated loads and that tag lines are used where appropriate.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD or UNDERGROUND UTILITIES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards"** ***HSE Program Documents:*** *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*
☐	**DEMOLITION**	☐ Develop/implement a demolition safety plan.
☐	**BLASTING, UNEXPLODED ORDNANCE**	☐ Develop/implement safety plan for blasting, unexploded ordnance, as applicable. ***HSE Program Documents:*** *HSE SOP-622: Blasting & Use of Explosives*
☐	**PUBLIC AT RISK, SITE SECURITY**	☐ During site operations protect public (overhead protection, fencing, barriers, warning signs). ☐ During off hours, protect public with fencing, barriers, warning signs/lights, other measures as appropriate. ☐ Lock/secure hazardous materials and/or equipment.

D.9. STORAGE/HANDLING OF BULK MATERIALS (for *Chemical* Storage, see D.14 & 15) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:	
☐	**BULK STORAGE HAZARDS:** ☐ Store materials in stable manner (stacked, racked, blocked, interlocked, tied, wrapped, or otherwise secured) to prevent tipping, sliding, rolling, falling or collapse.

	Collapse/movement of stacked/stored bags, blocks, containers, pipe, boxes, equipment, and similar. ☐ Stack/pallet/rack/shelf ☐ CONEX-box storage, or similar	☐ Do not exceed load limits and ensure storage structure is stable, robust, secure for intended load. ☐ Ensure stored materials do not block aisles, passageways, electrical panels, emergency equipment, emergency access/egress routes, vehicle routes.
☐	**LIFTING/MANUAL MATERIAL HANDLING HAZARDS**	☐ During manual handling of materials and equipment, use safe lifting practices and/or lift aids; do stretches and use safe postures to protect from acute strains/sprains, overexertion, and cumulative trauma injuries. ***HSE Program Documents:*** *HSE SOP-205a: Manual Materials Handling/Back Injury Prevention*

D.10. ELECTRICAL WORK TASKS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**USE OF BATTERIES, BATTERY-POWERED EQUIPMENT <50 V, OR OTHER DC EQUIPMENT < 50 V** Potential fire hazard (if terminals are shorted), eye/skin hazards (when electrolyte is replenished), inhalation hazard in enclosed spaces.	☐ Follow safe work practices to control hazards of voltage, shock, arcing, overheating, hazardous gases, irritant electrolytes, secondary hazards. ☐ Prevent short-circuiting of terminals when battery is in use (segregated from tools, metal objects) and during transport (use battery transport container or install guard/cover on positive terminal). ☐ For batteries requiring replenishment of electrolyte, use PPE for eye and skin protection, and have eyewash equipment at hand; see discussion of *acids/caustics/corrosives* in **D.14. "Commercial Chemical Products."**
☐	**"NORMAL OPERATION" OF ELECTRICAL EQUIPMENT CONNECTED TO AC OR DC POWER SOURCE ≥ 50 V:** Electrically powered tools, equipment, machinery, extension cords, portable generators, working near electrical equipment. Hazards: – Electrical shock – Fire Hazard – Secondary hazards (falls, other injuries).	☐ Follow "normal operation" requirements: • All electrical enclosures/guards/covers must be in place/closed/secured. • Electrical equipment maintained per codes/standards/manufacturer's recommendations. • Ensure no indication of damage or impending failure (heat, smoke, buzzing, odors, arcing, melting). • Operate equipment in accordance with manufacturer's standard operating procedures. ☐ Follow general electrical safety work practices to minimize shock hazard and secondary hazards: • Control water-related/wet-location hazards in a manner appropriate for the job tasks/equipment/tool. • Never touch electrical equipment if you are wet or standing/kneeling in water or on wet surfaces. • Use extension cords/power cords properly, rated for use conditions and current draw, prevent damage. • Inspect tool/equipment/extension cords/power cords before each use; remove from use if damaged. • Use GFCI-protected outlet or portable GFCI in wet/moist locations, outdoors, basements, concrete floors. • Do not enter any space delineated by an electrical approach boundary.
☐	**HANDS-ON DIAGNOSTICS/REPAIR ON CIRCUIT(S) CONNECTED TO POWER SOURCE < 50 V:** ☐ AC ☐ DC ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Stray voltage from soil electrodes	☐ Implement electrical safe work practices pertaining to: • Workers trained appropriately for the task. • Shock prevention measures. • Eye/skin protection for arcing hazards. • Protection from secondary hazards.
☐	**WORK WITHIN *"APPROACH BOUNDARY"* OF EXPOSED, ENERGIZED (OR POTENTIALLY ENERGIZED) CONDUCTORS AND/OR CIRCUIT PARTS CONNECTED TO POWER SOURCE 50-600 V*:** ☐ AC ☐ DC ☐ 3-phase ☐ Battery and/or solar power ☐ Capacitor(s) ☐ Induced voltage ☐ Stray voltage ≥50V from soil electrodes *** Working on >600 V not permitted for Geosyntec personnel**	☐ Prepare project-specific written "Electrical Safety Program" addressing (at a minimum): • Workers trained/designated as "Qualified Electrical Workers" per NFPA 70E (US)/CSA Z462 (CAN) • Assess risks of electrical shock (voltage levels and sources), arc flash hazard and secondary hazards. • Affix electrical hazard warning label to electrical enclosure(s) to be accessed. • Physically delineate arc flash- or limited approach boundary, whichever is farthest from hazard source. • Only "qualified" workers allowed within approach boundaries; prevent entry by non-qualified personnel. • Establish electrically safe working condition; work on live circuits prohibited (except for diagnostic testing). • Use PPE for shock/arc flash protection, as required. • Use other safe procedures/equipment required for the task, such as lockout/tagout.
☐	**LOCKOUT/TAGOUT (LO/TO) OF ELECTRICAL ENERGY** To prevent unplanned start-up or release of energy when equipment is under maintenance/repair.	☐ Prepare site-specific written LO/TO *program*, and equipment-specific written LO/TO *procedures* (as applicable); implement control procedures for hazardous energy sources, provide locks/tags, train workers, designate "authorized" personnel, notify "affected" personnel.
☐	**WARNING!** Confirmed or possible close proximity to **OVERHEAD ELECTRICAL UTILITY LINES.**	☐ Follow safe work practices per **D.11. "Utility-Related Hazards."**
		HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only), HSE SOP-452a: Lock-out/Tag-out (North America-only) HSE SOP-454a: General Electrical Safety (US-only)*

D.11. UTILITY-RELATED HAZARDS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**OVERHEAD, ABOVE-GROUND UTILITIES**	☐ Do not cross approach boundaries with personnel or equipment; employ other appropriate precautions for the conditions (specify above). ☐ Use additional controls, as applicable: shielding, flagging, observer/monitor, or, ☐ Arrange for power company/utility owner to de-energize power line.
☐	**UNDERGROUND UTILITIES**	☒ Confirm appropriate underground utility clearance procedures have been completed prior to ground penetrations, and employ other utility clearance/locator practices, as appropriate for conditions. ☐ Hand digging/augering or vacuum post-holing within 3' of utility locations or other high-risk condition.

HSE Program Documents: *HSE SOP-434a: Overhead and Underground Utility Hazards (US-only)*

D.12. CONFINED / ENCLOSED SPACES (Including Hazardous Indoor Spaces) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

Type of CONFINED/ENCLOSED/ HAZARDOUS INDOOR Workspace:
- ☐ Indoors (occupied)
- ☐ Indoors (abandoned, vacant)
- ☐ Basement, crawl space, attic
- ☐ Tunnel, shaft, inspection gallery
- ☐ Storage bin, locker
- ☐ Culvert, catch basin, sewer
- ☐ Well vault, utility vault, manhole
- ☐ Tank, vessel, silo, vat, hopper
- ☐ Trench, excavation
- ☐ Machine/equipment pit
- ☐ Transportation container, railcar
- ☐ Other – describe above

Confirmed or potential hazards:
- ☐ Flammable/explosive
- ☐ Oxygen deficiency
- ☐ Hydrogen sulfide
- ☐ VOCs
- ☐ Carbon monoxide
- ☐ Combustible dust
- ☐ Combustion/exhaust emissions
- ☐ Welding/cutting fumes
- ☐ Electrical
- ☐ Mechanical equipment
- ☐ Entrap, engulf, drowning
- ☐ Building-related hazards
- ☐ Other – describe above

REQUIREMENTS:

1. **Contact Corp. HSE Department** will determine applicability of confined space entry regulations, and to determine safe work practices for entry into any confined, enclosed, or hazardous indoor spaces.

2. **Classify the work task** by checking **one** of the following:

   ☐ **CONFINED SPACE** classified by regulatory authority as a "**Permit-Required Confined Space**" or otherwise specifically regulated as a **confined space** in the worksite's geographic jurisdiction.

   ☐ **CONFINED/ENCLOSED/INDOOR space NOT specifically regulated as a Confined Space;** develop site-specific entry procedure **per applicable regulatory and Geosyntec safety requirements**.

3. **Delineate tasks, hazards and controls** associated with the work in **Section C.1. "Summary of Tasks, Hazards and Controls,"** and in applicable sections in **Parts C, D and E of this THA**; incorporate or attach applicable safety provisions such as, but not limited to, the following:
   - Risk assessment; entry plan, entry permit system/safety checklist.
   - Air monitoring for atmospheric hazards.
   - Entry roles (supervisor, entrant, attendant), buddy system, regulatory training requirement.
   - Protect non-entry personnel from unauthorized entry (labels, signage, barriers)
   - Ingress/egress (stairway, ramp, ladder, tripod/winch, harness/lifeline, etc.).
   - Communication/alerting/rescue/emergency plan.
   - Entry hazard controls:
     - Isolate, clean, purge, inert, lockout/tagout, fire prevention.
     - *Dilution* ventilation to introduce fresh air
     - *Exhaust* ventilation to control point source of emissions.
     - Use duct/stack to direct hazardous emissions away from work area.
     - Respiratory protection.
     - Use PPE and safety gear to protect from chemical/physical/biological hazards.
     - Fall protection.
     - Traffic control.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE SOP-412a: Confined Space Entry Operations (US-only), HSE SOP-460: Field Site Exposure Monitoring*

D.13. INFECTIOUS / PATHOGENIC BIOHAZARDS ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐

HAZARD TYPE:
- ☐ Contagious respiratory illness
- ☐ Vector-borne infectious risk
- ☐ Wastewater, sewer, landfill
- ☐ Animal/human waste
- ☐ Wildlife contact, infectious risk
- ☐ Mold, fungi, valley fever
- ☐ Bloodborne pathogens
- ☐ Discarded syringes
- ☐ Medical waste
- ☐ Other (describe above)

- ☐ Follow internal guidance for mitigating airborne respiratory illness transmission (as applicable).
- ☐ Implement vector-protective measures (see also **Section D.1.b., "Biological Hazards"**)
- ☐ Use "Standard/Universal Precautions" as applicable to mitigate exposures to infectious/pathogenic hazards.
- ☐ Low hazard – use basic hygiene: onsite hand washing (soap & water preferred) and protective apparel/PPE.
- ☐ Med/high hazard – added PPE (gloves/barriers/respirator/dust mask), decon, remediation, as appropriate.
- ☐ For bloodborne human pathogens follow Bloodborne Pathogen Program and Standard/Universal Precautions.
- ☐ Contact HR Dept. for project-specific immunization (e.g., tetanus/diphtheria/pertussis [Tdap], hepatitis A/B).
- ☐ Implement remedial actions to mitigate infectious hazard source (remove syringes, clean up unsanitary waste/debris, decon/disinfect surfaces, etc.) as appropriate for the scope/scale of work.

HSE Program Documents: *HSE SOP-240: Mitigating Respiratory Illness Transmission in the Workplace, HSE SOP-408: Biting/Stinging Arthropods and Poisonous Plants, HSE SOP-612a: Bloodborne Pathogens (US-only)*

D.14. COMMERCIAL CHEMICAL PRODUCTS (per HAZCOM or WHMIS) ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

☐	**PRODUCTS REGULATED BY HAZCOM[1] (US) or WHMIS[2] (CAN)**	☐ Safety Data Sheets (SDSs) available, either on site or readily available within same work shift, containers labelled properly, workers trained/oriented on hazards. ☐ For subcontractor/contractor use of chemical products, confirm SDS availability for affected onsite workers.
	[1] OSHA Hazard Communication Standard (United States); [2] Workplace Hazardous Material Information System (Canada)	
☐	**GENERAL SAFE WORK PRACTICES FOR FIELD USE OF CHEMICALS**	☐ Consult SDS for HSE hazards, symptoms of exposure; ensure workers have been apprised of safe practices. ☐ Handle with care, maintain good housekeeping, provide adequate illumination in work area. ☐ Pour/dispense/transfer liquid chemicals on stable work surface. ☐ Use chemicals in well-ventilated area; use fans/blowers/exhaust for active ventilation, as appropriate. ☐ Have eyewash bottles, eyewash station, deluge capabilities, commensurate for the hazard, readily available. ☐ Have spill/neutralization equipment, appropriate for the chemicals, readily available. ☐ Conduct air monitoring as appropriate; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**
☐	**STORAGE/TRANSPORT OF CHEMICALS/HAZMAT** ☐ **Non-Emergency (Routine) Chemical Storage** Risk of personal contact and/or incidental release ☐ **HAZMAT Transport** ☐ **Risk of Emergency Spill/Release** ☐ **CFTAS (Chemical Facility Anti-Terrorism Standards) Applicability:** On-site overnight storage of non-waste chemical product at quantity ≥25 gal(115L) or ≥250 lbs. (115 kg)	☐ Transport chemicals only in sealed containers, secured to prevent shifting/breakage during travel. ☐ Store chemicals only in sealed containers; overnight storage in squirt/spray bottles is prohibited. ☐ Store flammable/combustible liquids in chemical storage cabinets, or other appropriate storage arrangement. ☐ For liquids, provide secondary containment during storage. ☐ Segregate incompatible chemicals during storage. ☐ For *incidental release/spill;* maintain spill kit suitable for low flammability/toxicity/quantity/volatility release. ☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/ Transportation.** ☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate emergency response contact in Part B, "Emergency Response and First Aid." ☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable. ☐ For CFTAS-applicable chemical storage, a safety and chemical management plan must be prepared and reviewed by a HSE Professional before bringing material to the site. (Does not apply to materials brought on to the site for daily work purposes and transported away at the end of each day)
☐	**COMPRESSED GAS CYLINDERS** ☐ Flammable ☐ Non-flammable ☐ Toxic ☐ Asphyxiant ☐ Oxygen	☐ Secure cylinders upright, caps on when not in use. ☐ Handle with care; use and store cylinders in a manner and location to prevent damage. ☐ Propane cylinders not in use must be stored outdoors in a cage or similar secure ventilated enclosure. ☐ Ensure acetylene cylinders are NOT secured to steel arc welding bench. ☐ Segregate oxygen and fuel gases by distance (20') or fire-rated barrier. ☐ Control ignition sources. ☐ "No smoking" signage at cylinder storage area for flammable gases.
☐	**FLAMMABLE/COMBUSTIBLE LIQUIDS**	☐ Use proper fuel safety can (metal fuel container with self-closing spout and flame arrestor preferred). ☐ Control/remove ignition sources near storage and use areas. ☐ Grounding and bonding where appropriate. ☐ Ensure a Type B or ABC fire extinguisher is readily available.
☐	**ACIDS, CAUSTICS, OTHER CORROSIVES**	☐ Use appropriate protection for eyes/face (goggles/face shield) and skin (gloves, sleeves, apron). ☐ Use eyewash, deluge shower, drench hose, hand washing (with water), as appropriate. ☐ For severe eye hazards (due to high corrosivity, large quantity), 15-min. eyewash required.
☐	**TOXIC**	☐ For toxic substances, use/store in a manner to control exposure hazards (inhalation, ingestion, skin contact, skin absorption); use active ventilation and/or PPE as appropriate.
☐	**EMISSIONS FROM FUEL COMBUSTION, HOT PROCESSES** ☐ Gasoline ☐ Diesel ☐ Propane/Natural Gas ☐ Welding/cutting/hot work ☐ Vehicle/equipment exhaust ☐ Other	☐ Position outdoor personnel upwind of exhaust source. ☐ Avoid "idling" of equipment when not in use. ☐ Use *passive ventilation* (air infiltration/air currents) to disperse atmospheric hazards in breathing zone. ☐ Use *dilution ventilation* (blowers/fans) to provide fresh air to work area and dissipate atmospheric hazards. ☐ Use *exhaust ventilation* (hood/duct/exhaust stack/blower) to capture/divert exhaust from work area. ☐ Use respiratory protection for high levels of smoke, exhaust particulates, soot. ☐ Conduct air monitoring as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
☐	**OTHER HAZARDS**	☐ Describe other hazardous substances and safety measures under "Site-Specific Notes & Clarifications," above.

HSE Program Documents: *HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-460: Field Site Exposure Monitoring*

D.15. SITE CONTAMINANTS, CHEMICAL WASTES ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes & Clarifications:

CHECK ALL THAT APPLY. Provide site-specific notes/clarifications above.

☐ Soil/groundwater contaminants (historical release) ☐ Recent release, known high concentrations ☐ Former chemical disposal site, landfill ☐ Urban fill, residual contaminants ☐ Containerized waste (drums, process equipment) ☐ Buried drums (known or potential) ☐ Large containers, potential for spills ☐ Contaminated building surfaces ☐ Unexploded ordnance	☐ Explosive dust ☐ Oxygen deficiency ☐ Chlorinated volatile organic compounds (VOCs) ☐ BTEX, petroleum derived VOCs ☐ Fuel oils, petroleum, waste oil, lubricants ☐ Metals, metal compounds, metal dusts ☐ Elemental mercury ☐ Polyaromatic hydrocarbons (PAHs) ☐ Potential for flammable vapors	☐ Potential for flammable gas (methane) ☐ Corrosive, acids/caustics, strong irritants ☐ Asbestos abatement work ☐ Pesticides, herbicides, fungicides ☐ Sensitizers ☐ Radioactive contaminants ☐ Controlled substances, drugs ☐ Wildfire smoke, see *HSE SOP 470a Protection from Wildfire Smoke Exposure* ☐ Other - describe above

NOTE: For sites with one or more **"high-risk contaminants"** (below) designated/recognized as a *contaminant of concern*, or *exceeding an environmental reporting threshold*, or representing a *potential exceedance of an action level or exposure limit*, the THA must be reviewed by the HSE Dept. before initiating the work:

☐ Asbestos ☐ Arsenic/arsenic compounds ☐ Benzene ☐ Beryllium ☐ Cadmium	☐ Chromium VI (hexavalent chromium) ☐ Crystalline Silica (airborne) ☐ Dioxins ☐ Mercury ☐ Hydrogen Cyanide (HCN)	☐ Lead ☐ Methylene chloride ☐ Polychlorinated biphenyls (PCBs) ☐ Vinyl chloride

☐ **FOR WORK CONSISTING OF CLEANUP OPERATIONS, CORRECTIVE ACTIONS, PRELIMINARY INVESTIGATIONS at an "UNCONTROLLED HAZ. WASTE SITE" (per HAZWOPER, 29 CFR 1910.120 or equivalent), delineate procedures in "Site-Specific Notes and Clarifications" (or attachments) addressing the following, as applicable to the work:**

- Workers attend **pre-work orientation** on hazards, risks, onsite safety measures, and emergency contingencies.
- Implement **site control plan** - delineate Exclusion Zone(s), Contaminant Reduction Zone(s), Support Zone (aka EZ, CRZ, SZ).
- Include **site map/figure** depicting work locations and other relevant site-specific information.
- Site workers in EZ or CRZ shall have **40-hour HAZWOPER training**, current 8-hour refresher, 3 days supervised field experience.
- Site supervisor(s) shall have **8-hour Supervisor training**.
- Site workers in EZ or CRZ shall participate in **medical monitoring** program, as applicable.
- Implement **site-specific procedures** for worker protection via engineering controls, work practices, personal protective equipment (PPE), air monitoring, decontamination procedures, spill containment, emergency preparedness and response.
- Conduct **air monitoring**, as appropriate; see **Part E," Air Monitoring, Worker Exposure Monitoring."**
- **PPE program: S**pecify **Levels of Protectio**n and specific PPE to be used for applicable tasks;
  - **Level D**: No respirator, no chemical protective clothing, standard work clothes, basic PPE; (COVID-19 face covers allowed)
  - **Modified Level D**: No respirator, chemical protective clothing as appropriate; (COVID-19 face covers allowed)
  - **Level C**: Air-purifying respirator, chemical protective clothing as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level B**: Air-supplied respirator, chemical protective clothing/suit as appropriate; **consult with Corp. HSE Dept. required**.
  - **Level A**: Fully encapsulating suit, self-contained breathing apparatus (SCBA); **Level A prohibited for Geosyntec personnel.**

☐ **FOR SITE WITH CHEMICAL CONTAMINANTS OR WASTE BUT NOT REGULATED BY HAZWOPER**

- Workers shall be knowledgeable/aware of chemical hazards thru safety training/orientation and availability of hazard information.
- Implement controls to minimize worker exposure through engineering controls, work practices, PPE, and decon, as appropriate.
- Evaluate worker exposure via air monitoring/sampling, as applicable; see **Part E, "Air Monitoring, Worker Exposure Monitoring."**

☐ **STORAGE/TRANSPORT OF IDW***	☐ Describe site-specific procedures above for spill containment, container handling, as applicable.
Spill/Release Risk:	☐ For liquids, provide secondary containment during storage.
☐ Risk of *incidental spill/release*	☐ Segregate incompatible chemicals during storage.
☐ Risk of *emergency spill/release*	☐ Locate emergency gear (eyewash, fire extinguisher, spill kit, safety signage) near storage area, as applicable.
	☐ For *incidental spills*; spill kit on-site for low-hazard releases (low-flammability/toxicity/quantity/volatility)
** Investigation-Derived Waste*	☐ For *emergency spills*: describe spill/release hazard and response plan/procedure above, and indicate Emergency response contact in Part B, "Emergency Response and First Aid."
	☐ DOT/TDG/IATA-Regulated transport: see **D.17. "Hazmat/Dangerous Goods Shipping/Transportation."**
☐ **OFF-SITE MIGRATION OF AIRBORNE CONTAMINANTS**	☐ Implement controls to minimize hazard migration (dust suppression, covers, foam, etc.). ☐ Community/perimeter air monitoring will be conducted per perimeter air monitoring plan; see **E.3 "Fence Line/Perimeter Air Monitoring."**

***HSE Program Documents**: HSE STD-120: Occupational Medical Management Program, HSE STD-125: Personal Protective Equipment Program, HSE STD-130: Respiratory Protection Program, HSE STD-145: Safety Training Program, HSE STD-150: Globally Harmonized System for Hazard Communication, HSE SOP-301a: Contaminated Site Investigation & Remediation (US-only), HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-634: Drum Sampling, HSE SOP-636: Handling of Uncharacterized Hazardous Waste Containers , HSE SOP 470a Protection from Wildfire Smoke Exposure*

D.16. RADIATION HAZARDS (Other than Sunlight) ☐ Applicable ☒ Not Applicable, Not Anticipated

D.17. SHIPPING/TRANSPORTATION HAZMAT/DANGEROUS GOODS ☐ Applicable ☒ Not Applicable, Not Anticipated

MODE(S) OF TRANSPORT:	☐ Road	☐ Rail	☐ Air	☐ Sea	☐ Inland Waterway	☐ International

IMPORTANT: Ensure that each individual who will be involved in shipping/transportation of hazardous material is current with required training (awareness, function-specific, safety, security) in accordance with applicable regulatory authority (DOT, FAA, IATA, TDG), and ensure adherence to applicable regulations.

HSE Program Documents: *HSE SOP-235a: Hazardous Materials Shipping (US-only)*

Site-Specific Notes & Clarifications: Transporting small helium tanks via field vehicle to and from the site.

PART E – AIR MONITORING, WORKER EXPOSURE MONITORING

E.1. AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Site-Specific Notes, Clarifications: .

AIR-TESTING PARAMETERS - Select site-specific testing parameters; list associated equipment in Part C.2, Safety Equipment List.

☐ **VOCs** ☐ **PID** (Photoionization detector): **X** eV ☐ **FID** (Flame ionization detector) ☐ **Colorimetric indicator tubes** – describe above	☐ **O_2** (Oxygen) – oxygen meter ☐ **LEL** (Lower Explosive Level) - LEL meter ☐ **H_2S** (Hydrogen Sulfide) – H_2S detector ☐ **CO** (Carbon monoxide) – CO detector	☐ **Particulates** - total dust meter ☐ **% Methane** – methane meter ☐ **Calibration kit** for each parameter ☐ Other:

SUBSTANCE-SPECIFIC (PRE-SET) ACTION LEVELS - Sustained breathing zone action levels (sustained general work-area levels for LEL).

☐ **O_2** (Oxygen)	**19.5-23%**	Acceptable to continue work without O_2-focused respiratory protection.
	<19.5%	STOP WORK, ventilate to raise O_2 to >19.5% for re-entry. For persistent hazard, contact Corp. HSE Dept.
	>23.0%	STOP WORK, ventilate to lower O_2 to <23% for re-entry. For persistent hazard, contact Corp. HSE Dept.
☐ **LEL** (Lower Explosive Limit)	IMPORTANT:	Confirm sufficient oxygen is present (min. 8-12%) to ensure accurate LEL readings.
	<10% LEL	Acceptable to continue working in work area; continue to monitor LEL.
	≥10% LEL	STOP WORK. Implement controls (reposition workers, ventilate, contain/eliminate source, etc.); resume work ONLY when LEL readings are <10%, sustained.
☐ **H_2S** (Hydrogen Sulfide)	**< 1 ppm**	Acceptable to continue work without H_2S-focused respiratory protection.
	1-10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <1ppm, or use APR* with *VOC/acid-gas* cartridges (yellow); do not exceed MUC* for respirator type; confirm acceptability of respirator usage with HSE Dept.
	> 10 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <10ppm (with respirator), or <1ppm (without respirator). For persistent levels >10 ppm, STOP WORK, contact task lead, PM, or HSE Dept.
☐ **CO** (Carbon Monoxide)	**< 25 ppm**	Acceptable to continue work without CO-focused respiratory protection.
	≥ 25 ppm	Implement controls (reposition workers, ventilate, contain/eliminate source, scheduling, etc.) to limit exposures to <25ppm. For persistent levels >25ppm, STOP WORK, contact PM and/or HSE Dept.
☐ **WILDFIRE SMOKE** (AQI for PM 2.5)	**≤69**	In this **Air Quality Index (AQI)** range, it is acceptable to continue work without respiratory protection.
	>69 – <100	Voluntary use of N95 respirator is appropriate.
	>101 – <500	Distribute N95 respirators to all personnel Provide work and/or rest areas in enclosed buildings. Relocate work indoors, or to an outdoor location with a lower AQI; Changing work schedules so outdoor work can occur when the AQI is lower; Providing portable HEPA filters in enclosed areas; Reduce the amount of work that involves physical exertion, and provide additional rest periods. Consider rescheduling fieldwork to a date/time when the AQI is likely to be lower.
	>500	STOP WORK, or use APR* with approval of HSE Dept.
☐ **<OTHER>**		

SITE-DERIVED ACTION LEVELS – Sustained breathing zone action levels; derived based on site contaminants; REVIEW WITH CORP. HSE DEPT. REQUIRED.

☐ **VOCs** (Volatile Organic Compounds)	**< X ppm**	Acceptable to continue work without VOC-focused respiratory protection.
	> " ppm	Implement controls (reposition workers, ventilation, containment, eliminate source, etc.) to lower VOC exposures to less than specified action level, or use APR* with approval of Corp. HSE Dept.
	X to X ppm	Use APR* with *VOC* cartridges (yellow or black); do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.
	> X ppm	STOP WORK. Implement controls, for persistent levels greater than action contact PM and/or HSE Dept.
☐ **AIRBORNE DUST** (Total Particulates)	**< X mg/m³**	Acceptable to continue work without particulate-focused respiratory protection.
	> " mg/m³	Implement controls (water spray, reposition workers, ventilation, containment, etc.) to lower dust levels to less than specified action level, or use APR* with approval of HSE Dept.
	X to X mg/m³	Use APR* with particulate cartridges appropriate for the hazard; do not exceed MUC** for respirator type; confirm procedures for respirator usage with HSE Dept.

	> mg/m³	STOP WORK. Implement controls. For persistent levels greater than action level, contact PM and/or Corp HSE Dept.
☐ <OTHER>		
	* Air-purifying respirator ** Maximum use concentration	
	HSE Program Documents: *HSE SOP-460: Field Site Exposure Monitoring, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP 470a Protection from Wildfire Smoke Exposure*	

E.2. OTHER WORKER EXPOSURE MONITORING / SAMPLING ☐ Applicable ☒ Not Applicable, Not Anticipated

☐ Heat/Cold Stress Testing/Monitoring	☐ Wildfire Smoke – Tracking AQI (Air Quality Index)	☐ <Other>
☐ Air Sampling *(sample collection, passive dosimeter)*	☐ Ionizing or Non-ionizing Radiation Testing	☐ <Other>
☐ Wipe/Bulk Sampling *(to evaluate worker exposure)*	☐ Noise Testing	

Site-Specific Notes, Clarifications:

HSE Program Documents: *HSE STD-135: Hearing Protection Program, HSE STD-140: Radiation Safety Program, HSE SOP-230: Ionizing and Non-Ionizing Radiation Protection, HSE SOP-409: Heat Illness Prevention, HSE SOP-410: Cold Stress Prevention, HSE SOP-462: Asbestos Exposure Control, HSE SOP-464: Lead Exposure Control, HSE SOP-466: Hydrogen Sulfide Exposure Control, HSE SOP-468a: Respirable Crystalline Silica Exposure Control (US-only), , HSE SOP 470a Protection from Wildfire Smoke Exposure*

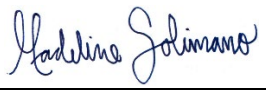
E.3. FENCELINE / PERIMETER AIR MONITORING ☐ Applicable ☒ Not Applicable, Not Anticipated

Fence line/perimeter air monitoring to be conducted in accordance with a separate **"Perimeter Air Monitoring Plan"** for this work; results from *fence line/perimeter* air monitoring shall NOT be used as the sole basis for determining *work zone* atmospheric hazards.

Site-Specific Notes, Clarifications:

PART F – APPROVALS, ACKNOWLEDGEMENTS

F.1. THA PREPARATION, REVIEW/APPROVAL SIGNATURES A THA is typically prepared by project staff, often with input from an HSC, with review/approval, at a minimum, by PM and/or Field Lead. Corporate HSE staff must be consulted as required or otherwise deemed appropriate*.

	Printed Name	***Signature***	***Date***
PREPARER(S)	Jensen Perrick		7/1/2025
	Madeline Solimano		7/2/2025
THA REVIEWED/ APPROVED BY: (Project Manager or PM-Designee, at a minimum)**	***Printed Name***	***Signature***	***Date***

* At a minimum, Corp. HSE **must** review/approve the THA review when Geosyntec staff will encounter "high hazards/high risks," or perform critical tasks, such as (but not limited to):

- Work at heights >10', use personal fall apparatus
- Work at height near overhead electrical utility lines
- Operate a UTV/ATV, aerial lift or fork-lift
- Tow a trailer on roadway
- Oversee a hot-work permit system
- Enter a hazardous confined/enclosed space
- Use of unmanned aerial vehicle (drone)
- High-risk ergonomic/musculoskeletal hazard
- Implement lockout/tagout controls
- Enter a trench/excavation >5' deep
- Function as a construction "Competent Person"
- Operate a pneumatic or powder-actuated tool
- "Qualified" Electrical testing & maintenance >50 V
- High risk, non-typical infectious/pathogenic hazard
- Derive action levels for VOCs or toxic dusts
- Instrument monitoring for critical exposure risks
- Wear a respirator
- Presence of "high-risk" contaminant(s)
- Sustained exposure to wildfire smoke $AQI_{PM\ 2.5}$ >150
- Exposure to radioactive isotopes (α, β, γ)
- High-risk exposure to: non-ionizing (microwave, EMF, UV, IR) or ionizing (radio-isotope, x-ray) radiation.
- Onsite risk of emergency chemical spill
- Applicability of Chemical Anti-Terrorism Standards

Corporate HSE **must** also be consulted when Geosyntec subcontractors (*under Geosyntec's oversight*) perform high hazard/high risk work (such as demolition, blasting, crane critical lifts, confined space entry, testing/maintenance of electrical systems, lockout/tagout, HAZWOPER cleanup activities). Consultation with Corp. HSE is encouraged for all questions/concerns regarding worker safety, regulatory compliance, risk/liability aspects, or project-specific safety requirements.

** It is recommended that THAs be approved/signed by both the PM *and* Field Lead (or alternate PM designee), unless due to small scope/scale or routine nature of task, or staff unavailability, only one approval is deemed sufficient by PM. Additional review and approval will be performed by Corp. HSE for high-hazard/high-risk tasks, or as otherwise requested.

F.2. GEOSYNTEC FIELD CREW ACKNOWLEDGEMENTS

Please sign below to acknowledge you reviewed and understand this THA, participated in project safety briefing, and had an opportunity to ask questions about the information herein.

Printed Name	Signature	Employee No.	Date

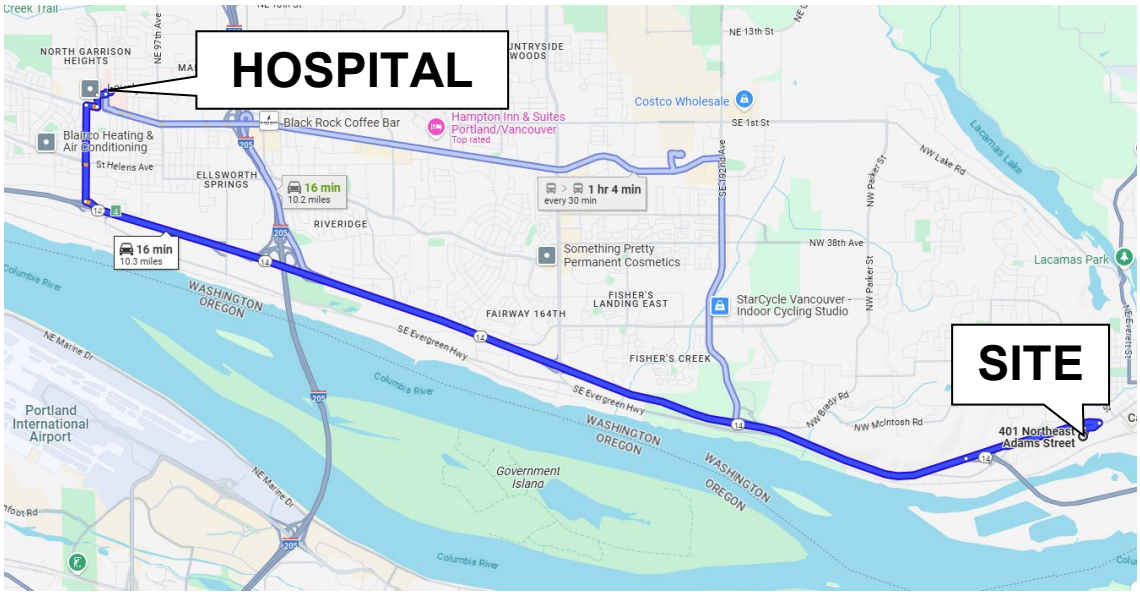
F.3. SUBCONTRACTOR'S FIELD CREW ACKNOWLEDGEMENTS ☐ Applicable ☐ Not Applicable

Please sign below to acknowledge this THA was made available to you, and you had an opportunity to ask questions about the information herein.

Printed Name	Signature	Company Name	Date

ATTACHMENTS:

Attachment A – Route to Hospital



Hospital Name: Peace Health Southwest Medical Center
Address: 400 NE Mother Joseph Place
Phone Number: (360) 729-8370

Directions To Hospital From Site:
Get on WA-14 from NW 6th Avenue (4 min, 1.4 mi)

- Head north toward NW 6th Avenue (371 ft)
- Turn right (0.1 mi)
- Turn left onto NW 6th Avenue (0.8 mi)
- At the traffic circle, continue straight onto the WA-14 ramp (0.4 mi)

Follow WA-14 W to S Lieser Road in Vancouver. Take exit 4 from WA-14 W (8 min, 7.8 mi)

- Merge onto WA-14 W (7.6 mi)
- Take exit 4 for Lieser Road toward SE 88th Ave (0.2 mi)

Continue on S Lieser Road. Drive to NE Mother Joseph Place (4 min, 1.1 mi)

- Turn right onto S Lieser Road (0.8 mi)
- Turn right onto E Mill Plain Boulevard (489 ft)
- Use the 2nd from the left lane to turn left onto NW 87th Avenue (0.1 mi)
- Turn right toward NE Mother Joseph Place (367 ft)
- Turn left toward NE Mother Joseph Place (335 ft)

HSE Event Response and Notification

Geosyntec consultants

CHOOSE THE BEST PATH!

EMERGENCY EVENT (catastrophic occurrence, injury or illness requiring emergency medical care, etc.)

IMMEDIATELY CALL 911 or alternate emergency number for your locale*

Conduct First Responses (rescue/assist injured, stop work, evacuate, stabilize worksite, other**)

Meet Arriving Emergency Responders and apprise them of the situation (fire, ambulance, police, other)

Notify HSE TEAM ASAP by phone or EVENT NOTIFICATION TOOL

NOTIFY your Manager, Supervisor, Client, and other key contacts ASAP

COMPLETE full *Incident Report* within 24 hours (use link in followup email you'll receive after submitting an **EVENT NOTIFICATION**)

NON-EMERGENCY EVENT or **NEAR MISS**

Stabilize the situation and provide initial care/support**

Notify HSE Team using EVENT NOTIFICATION TOOL within 1 hour after injury/illness or vehicle accident; by end of workday for other events.

For injury/illness or vehicle accident, HSE will attempt call-back within 1 hour of EVENT NOTIFICATION

Proceed as Directed by HSE for Medical Triage* and other aspects**

GOOD CATCH (Observed unsafe condition or non-compliance, positive safety observation, improvement suggestion, etc.)

Submit a **Good Catch** using the EVENT NOTIFICATION TOOL (on same day of occurrence)

IMPORTANT: To load the **EVENT NOTIFICATION TOOL** onto your mobile device, scan this QR code:

* 911 in North America; 112 in EU; 999 & 112 both applicable in UK; 000 in Australia; for other country- or site-specific numbers, see your Written Safety Plan or Office Emergency Plan

** First response actions by site/project team should always be in accordance with general-duty obligations, on-site roles, and training qualifications

*** Employees may initiate a call for medical triage/support if no call-back received from HSE within 60 minutes of Event Notification, or if HSE is not available directly by phone. For the medical support contact in your location (*WorkCare in North America; location-specific elsewhere*) see your Written Safety Plan or Office Emergency Plan, as applicable

If you have questions or concerns about any workplace health and safety matter, please contact a member of your Corporate HSE Team for assistance:

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HSE Health, Safety, and Environment

Attachment C: Summary of Chemical Hazards

Dioxins and Furans

Dioxins and furans (D/F) are part of a family of chemicals consisting of chlorinated aromatic compounds, including chlorinated dibenzo-p-dioxins, chlorinated dibenzofurans, and a subset of polychlorinated biphenyls. D/F are not produced commercially, but are the byproduct of commercial and industrial operations. Common industrial processes that generate D/F include bleaching and burning of organic material in the presence of halogens.

Exposure to D/F can be from contaminated drinking water, or ingestion of contaminated food. Exposure to D/F can cause cancer, cause developmental problems, and damage the immune system.

Chemical Name	PEL[1]	TLV[2]
Dioxin	None	None
Furans	None	None

[1] OSHA Permissible Exposure Limit (in parts per million [ppm])
[2] American Conference of Governmental Industrial Hygienists Threshold Limit Value (in ppm)

Petroleum Hydrocarbons

Petroleum hydrocarbons likely at the Site include tar and/or fuel-related materials in soils and sediments. Gasoline, diesel, oil, and heavier hydrocarbons, such as grease, may be present. Volatile components of gasoline include benzene, toluene, ethylbenzene, and xylenes (BTEX).

The primary exposure routes for petroleum hydrocarbons during Site activities are inhalation, dermal contact, and ingestion of contaminated soil, sediment, dust, or water. Lighter petroleum hydrocarbons, such as gasoline and benzene, readily volatilize and are primarily an inhalation concern, whereas the primary route of exposure to heavier petroleum hydrocarbons, such as aromatic hydrocarbons, oil, and grease, is dermal contact. The target organs primarily affected by prolonged exposure to petroleum hydrocarbons are the respiratory system, central nervous system, kidneys, liver, and skin. Prolonged dermal contact with petroleum hydrocarbons can cause irritation or dermatitis. The BTEX compounds are known or suspected human carcinogens.

Petroleum hydrocarbons, such as gasoline, are also flammable and can be a physical hazard when present in high concentrations. Combustion of petroleum hydrocarbons can produce carbon dioxide, carbon monoxide, aldehydes, fumes, smoke (particulate matter), and other products of incomplete combustion. Intentional and inadvertent combustion of petroleum hydrocarbons is not expected during sampling activities; however, personnel will evacuate the area should a fire occur. The table below summarizes BTEX exposure limits.

Chemical Name	PEL[1]	TLV[2]
Benzene	1	0.5
Toluene	200	50
Ethylbenzene	100	100
Xylene	100	100

[1] OSHA Permissible Exposure Limit (in parts per million [ppm])
[2] American Conference of Governmental Industrial Hygienists Threshold Limit Value (in ppm)

Resource Conservation and Recovery Act (RCRA) Metals

These metals include arsenic, barium, cadmium, chrome, mercury, selenium, and silver. Heavy metals are known to cause neurologic effects (lead, mercury), kidney damage (cadmium), and respiratory damage (arsenic, cadmium). Oral and respiratory exposures should be minimized. The table below summarizes exposure limits.

Chemical Name	PEL[1]	TLV[2]
Arsenic	0.01	0.01
Lead	0.05	0.05
Mercury	0.01	0.25

[1] OSHA Permissible Exposure Limit (PEL) in parts per million
[2] ACGIH Threshold Limit Value (TLV) in parts per million

Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs are produced during combustion events due to inadequate oxidation of fuel. PAHs in the pure state are yellowish crystalline solids. They are found in coal tar and in products of incomplete combustion. These chemicals have varying degrees of potency for causing cancer, with benzo(a)pyrene being among the most potent. The PAHs are evaluated collectively as COAL TAR PITCH VOLATILES. Coal tar pitch volatiles may cause photo-sensitization and a rash where sunlight strikes the skin. Exposure may also cause cancer of lungs, skin, bladder or kidneys. Benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, and indeno(1,2,3,c,d)pyrene have been identified as carcinogenic.

This information on PAH compounds is presented for Site contaminant awareness. While the potential for Site personnel sustaining significant inhalation exposures to volatilized PAH compounds during the Site activities of this project is minimal, there is the potential for inhalation of PAH-contaminated dust, and handling of contaminated soils presents skin exposure hazards. Use of dust suppression techniques (as appropriate) and the proper use of the PPE will adequately protect personnel. Some significant PAH compounds include:

- Anthracene
- Benzo(a)pyrene, benzo(a)anthracene

- Chrysene, benzo(b)fluoranthene
- Fluoranthene, benzo(k)fluoranthene
- Fluorene, benzo(g,h,i)perylene
- Indeno(1,2,3,c,d)pyrene, benzo(d,e,f)phenanthrene
- Phenanthrene

OSHA PEL for coal tar pitch volatiles is 0.2 milligrams per cubic meter (mg/m^3) and National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limit (REL) is 0.1 mg/m^3, TLV 0.2 mg/m^3 is for 8-hour time-weighted average (TWA).

Attachment D: Air Monitoring

APPLIES TO TASK: ① ☐ ② ☐ ③ ☒ ④ ☐ ⑤ ☐ ⑥ ☒ ⑦ ☐

☐ *Photoionization Detector (PID)*

Brand/Model No.:_____ **eV:**_____

Monitoring Frequency:_____

Breathing Zone Reading (ppm)	Action
_____ to _____	Level D PPE
_____ to _____	Level C PPE
Greater than __ _____	Stop work. Evacuate the area. If upon return, levels still exceed the action level, stop work and implement engineering controls.

Note: _____

☐ *Oxygen (O_2) Meter*

Brand/Model No.:_____

Monitoring Frequency:_____

Reading (%)	Action
Less than 19.5	Stop work. Evacuate the area.
19.5 to 23.5	Continue to work with caution.
Greater than 23.5	Stop work. Evacuate the area.

Note: _____

☐ *Explosimeter*

Brand/Model No.:_____

Monitoring Frequency:_____

Source (% LEL)

Reading	Action
1 to 10	Continue with caution.
Greater than 10	Stop work. Evacuate the area. If upon return, concentration still exceeds 10% LEL, ventilate until concentration is back to <10% LEL.

Note: _____

☐ *Flame Ionization Detector (FID)*

Brand/Model No.: _____

Monitoring Frequency: _____

Breathing Zone Reading (ppm)	Action
_____ to _____	Level D PPE
_____ to _____	Level C PPE
Greater than __ _____	Stop work. Evacuate the area. If upon return, levels still exceed ___, stop work and implement engineering controls.

Note: _____

☐ *Chemical Detector Tube*

Brand/Model No.:_____

Monitoring Frequency:_____

Breathing Zone Reading (ppm)	Action
_____ to _____	Level D PPE
_____ to _____	Level C PPE
Greater than __ _____	Stop work. Evacuate the area. If upon return, levels still exceed ___, stop work and implement engineering controls.

Note: _____

☐ *Other*

Brand/Model No.:_____

Monitoring Frequency:_____

Breathing Zone Reading	Action
_____ to _____	Level D PPE
_____ to _____	Level C PPE
Greater than __ _____	Stop work. Evacuate the area. If upon return, levels still exceed ___, stop work and implement engineering controls.

Note: _____

Attachment E: Personal Protective Equipment

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Potential PPE Level per Task:	☒ D ☐ C	☒ D ☐ C	☒ D ☐ C	☒ D ☐ C	☒ D ☐ C	☒ D ☐ C	☒ D ☐ C

Modified Level D		***Level C***	
Equipment	***Material/Type***	***Equipment***	***Material/Type***
☒ Eye protection	Glasses or face-shield	☐ Full-face air-purifying respirator	Cartridge Type:
☒ Work Boots	Chemically resistant, safety-toed work boots	☐ Half-mask air-purifying respirator	Cartridge Type:
☒ Protective clothing	Long pants, shirt with sleeves, nitrile gloves	☐ Safety glasses	
☒ Hard hat*	Hard hat with chin strap	☐ Hard-toed boots	
☒ Hearing protection*	Ear plugs/muffs (as needed)	☐ Protective clothing	
☒ High-visibility vest*	Class II	☐ Hard hat	
☐ Outer boots*		☐ Hearing protection*	
☐ Outer gloves*		☐ High-visibility vest*	
☐ Other:		☐ Outer boots*	
		☐ Outer gloves*	
		☐ Inner gloves*	
		☐ Other:	

* PPE items may be downgraded (only with concurrence of SHSO and PM).

Attachment F: Safety Data Sheets

Included in this HASP	Chemical
☒	Alconox
☒	Bentonite
☒	Hexane
☒	Isobutylene Calibration Gas
☐	Other: _____
☐	Other: _____
☐	Other: _____
☐	Other: _____

Note: SDSs are for chemicals used to perform project work, not site contaminants.

APPENDIX A-2
Standard Operating Procedures

Standard Operating Procedures

This Appendix describes standard operating procedures (SOPs) for anticipated field activities pertaining to the site investigation as outlined in the Remedial Investigation Work Plan (RI WP). The following SOPs included in this appendix will guide sampling activities:

- SOP-1: Field Documentation, Sample Designation, Custody and Handling Procedures
- SOP-2: Using a Photoionization Detector (PID)
- SOP-3: Borehole Logging
- SOP-4: Soil Sampling
- SOP-5: Well Construction and Development
- SOP-6: Measuring Groundwater Levels
- SOP-7: Groundwater Sampling
- SOP-8: Measurement of Water Quality Parameters
- SOP-9: Collecting Field Duplicates
- SOP-10: Sample Packing and Shipping
- SOP-11: Equipment Decontamination and Rinsate Blanks
- SOP-12: Personnel Decontamination
- SOP-13: Handling and Disposal of Investigation-Derived Waste
- SOP-14: Sampling for Per- & Polyfluoroalkyl Substances (PFAS)

The SOPs identified above are generic and intended to be suitable for a variety of site conditions. It is anticipated that the specific procedures outlined in the SOPs may be modified in the field, as needed, to address site-specific conditions. Deviations from, and additions to, the procedures described herein may be appropriate based on project-specific objectives, site-specific conditions, and/or regulatory requirements. Deviations from the SOPs identified above should be documented in the field notes.

SOP NO. 1

Field Documentation, Sample Designation, Custody and Handling Procedures

SOP No. 1
Field Documentation, Sample Designation, Custody and Handling Procedures

SECTION 1 INTRODUCTION

1.1 Overview

This standard operating procedure (SOP) was prepared to provide instructions to field personnel for collecting environmental data, including proper recordkeeping in the field. This document describes the procedures to be followed for field documentation, sample designation, custody, and handling.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of this SOP is to ensure that information relevant to field operations is properly documented, and that activities are accounted for and can be reconstructed from written records. Several types of field notes should be used for this purpose and should be used consistently by field personnel (e.g., field logbooks, field forms).

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Sample labels
- Chains-of-custody

- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 FIELD DOCUMENTATION

During field sampling events, field logbook and field data sheets are used to record daily field activities. The purpose of the field logbook is to document events that occur, and record data measured in the field that are not recorded on field forms.

At a minimum, the field personnel will record the following information daily in the field logbook or on a field sampling form, as applicable:

- Project name, project location, project number and daily objective
- Project start date and end date
- Date and time of entry (24-hour clock)
- Time and duration of daily sampling activities
- Weather conditions at the beginning of the field work and any changes that occur throughout the day, including the approximate time of the change
- Name of person making entries and other field personnel, including the times that they are present
- On-site visitors, if any, including the times that they are present
- The name, agency, and telephone number of any field contacts
- The sample number and analysis code for each sample to be submitted for laboratory analysis
- Field measurements made, including the time that the measurement was collected
- The sampling location name, date, gear, water depth (if applicable), and sampling location coordinates
- Type of sample gear used (e.g., pump type or model, size of core barrel)
- The location and description of the work area, including sketches and map references, if appropriate
- Specific information on each type of sampling activity
- The sample type (i.e., groundwater, dense non-aqueous phase liquid (DNAPL), soil, sediment), and sample number
- Blind duplicate parents/cross-references of numbers for duplicate samples

- A description of the sample (source and appearance, such as soil or sediment type, color, and odor)
- Log of photographs (number taken, brief description of photo) taken at the sampling location, if any
- Variations, if any, from specified sampling protocols and reasons for deviation
- References to other logbooks used to record information (e.g., field data sheets, health and safety log)
- The signature of the person making the entry

Monitoring or sampling equipment information, including installation information, any maintenance performed on each piece of equipment, calibration information, and other observations relating to the operation or condition of the equipment should be recorded on field forms, in field logbooks, and/or in a separate field logbook maintained for a specific type of monitoring or sampling equipment. Upon completion of the field sampling event, the field team leader shall be responsible for scanning copies of the field logbooks and field data forms, uploading electronic copies to the project server, and submitting all field logbooks and field data forms to the project manager. Hard copies and an electronic copy shall be maintained in the project files.

2.1 Field Logbook

Data entry should be made in a waterproof field logbook with consecutively numbered pages using indelible ink for each sampling event; all entries should be signed and dated, and no erasures should be made. Corrections should consist of a single line-out deletion, followed by the sampler's initials and the date. The sampler will sign and date the last page at the end of each day, and a line should be drawn through the remainder of the page.

The project name, site name and location, and dates of sampling activity should be written on the cover of the field logbook. If more than one logbook is used during a single sampling event, then the upper right-hand corner of the logbook should be annotated (e.g., 1 of 2, 2 of 2) to indicate the number of logbooks used during the field event. Alternatively, multiple logbooks could be used for different sampling activities (e.g., one logbook per Mill Operable Units [MOUs]). When multiple logbooks are used for a single sampling activity (e.g., two or more sampling teams operating simultaneously during a single sampling event) logbooks should be annotated alphabetically to indicate which of those logbooks is the primary, secondary, etc. logbook for that sampling activity, followed by the number of the logbook. For example, if soil sampling requires three teams and each has a logbook to record daily activity over the sampling event, then the primary book should be labeled "Logbook A-1" and the others as "B-1" and "C-1." When only one team is on-site, they will use the primary (A) logbook. Field logbooks should be securely stored when not in use in the field.

2.2 Field Forms

In addition to the field logbook, supplementary field data forms may be used during a field sampling event to record the relevant information. Field forms shall be used for specific field sampling tasks of a routine and repetitive nature, such as soil sampling, well purging, or well installation. Field forms have the advantage of prompting the user for detailed data documentation in a consistent format.

Field forms should be completed using the following protocols:

- One form should be filled out per sample
- Corrections shall be made through single-line strikeout with initial and date
- Tables within forms (e.g., field parameters during well purging) shall be filled out with each line in sequence; no lines should be skipped, and unused lines at the end of sample collection shall be crossed out, initialed, and dated
- Forms must be signed and dated by the person making and recording the measurements

SECTION 3 SAMPLE DESIGNATION, CUSTODY, AND HANDLING

3.1 Sample Labels

A self-adhesive, non-removable label should be affixed to each sample container using the sample identification protocol described in the RI WP or SAP. Sample identification labels can be completed (1) in the field by writing on the labels using an indelible pen, or (2) by pre-printing in the office prior to going to the field site.

Sample labels should contain the following information: (1) client name, (2) site name, (3) sample name (according to the SAP), (4) analysis request-analytical method (e.g., VOCs – 8260), (5) date collected (month/day/year), (6) sample time given as military time (e.g., 1400 for 2:00PM), (7) name/initials of collector, and (8) preservative: (e.g., none, hydrochloric acid [HCl]).

Client Name *Dept of Ecology*	Site Name *Camas Mill*
Sample ID *MW-B3.1-20240131-GW*	Sample date/time *01/31/2025 1532*
Analysis *VOCs - 8260*	Sampled By *JS*
Preservative *HCl*	

Example of completed sample label.

If samples are likely to contain high concentrations of non-aqueous phase liquids (NAPL) or other analytes, the samples should be identified on the chain-of custody forms. Locations where field

quality control (QC) samples (e.g., field duplicate, matrix spike, and matrix spike duplicate) are collected should be documented in the field records.

3.2 Sample Handling

Immediately following sample collection, the groundwater or soil samples should be capped, labeled, sealed in plastic bags, and placed into an insulated cooler. The cooler should be maintained at a temperature using adequate ice packs, or ice sealed in a plastic bag, such that the coolers will arrive at the laboratory at a temperature of 4 degrees Celsius (°C) ± 2° C. Each cooler should be packed in a manner that will prevent damage to sample containers during transport. Soil or groundwater samples that are held overnight should be stored in a secure refrigerated location.

Samples sent to the laboratory should be carefully checked against the chain-of-custody form (discussed below). Groundwater or soil samples shall be submitted to the analytical laboratory in a timely fashion (via overnight shipment or courier), preferably on the day of sampling or as soon as possible thereafter. Tracking number(s) and time released to the delivery service should be documented.

The project manager will verify with the laboratory that samples were received, and that, prior to beginning analytical testing, the laboratory understands the chain of custody and requested analyses.

3.3 Sample Custody and Documentation

Chain-of-custody forms should be used to trace the possession and handling of samples from their collection, through analysis, until their final disposition. These forms will document the names of the relinquishing and receiving parties, the time and date of the transfer of custody, and the reason for the transfer of custody. Field personnel will complete the following information on each chain-of-custody form:

- Project number
- Client or project name
- Project location
- Sample identification number
- Date and time of sample collection
- Sample matrix
- Preservative
- Analyses requested
- Sampler's signature

- Signature of person relinquishing sample custody to the laboratory (courier, FedEx, etc.)
- Date and time relinquished
- Sampler remarks

One chain-of-custody form will accompany each set of coolers sent to the laboratory. Field personnel will verify (1) that sample identifications, sampling times, and requested analyses on the chain-of-custody form match the sample identifications, sampling times, and requested analyses on the sample labels; (2) that the appropriate QC samples (field duplicate samples, trip blanks samples, etc.) required in the RI WP or SAP were collected; and (3) that the appropriate sample volume was collected to enable the analytical laboratory to perform QC analyses (e.g., matrix spike and matrix spike duplicate analysis).

The chain-of-custody form should be placed in a sealed plastic bag inside the cooler. A custody seal should be placed on each cooler after packing and prior to shipment. For multiple cooler shipments, the cooler number designation (e.g., cooler 1 of 2, cooler 2 of 2) should be written on the custody seal. Samples should be shipped to the laboratory via FedEx or equivalent overnight service. Samples will remain in the custody of the sampling team until custody is relinquished to FedEx or a laboratory courier. Each sample shipment should be tracked via the FedEx tracking number or equivalent to ensure that prompt delivery of the shipment to the laboratory has occurred. A copy of the chain-of-custody form will then be transmitted to the project manager and uploaded to the project file.

SOP NO. 2

Using a Photoionization Detector (PID)

SOP No. 2
Using a Photoionization Detector (PID)

SECTION 1 INTRODUCTION

1.1 Overview

This SOP identifies the procedures that should be used by field personnel for conducting headspace measurements during field investigations using a photoionizing detector (PID).

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of headspace screening is to gain accurate field measurements from soil media encountered during boring or soil sampling. The procedure involves collecting soil samples, sealing them in airtight containers or bags, and then analyzing the total organic vapors (TOVs) that form within the container using a portable vapor/gas detector.

Headspace data can be used as part of a health and safety program to pre-screen analytical samples, or as a guide during subsurface investigations. Data collected using these methods are considered qualitative and specific compounds cannot be distinguished; however, the data is sufficient information for determining “hot spots” and general levels of contamination.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms

- Photoionization detector (PID)
- Zip-top plastic bags
- Aluminum foil
- Clean jars (approximately 500 milliliters or larger for soil; jars with less than 8 ounce capacity should not be used)
- Field logbook
- Decontaminated stainless steel sampling equipment
- Calibration gas with regulator, tubing
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

Environmental factors may influence the performance of these methods. These factors include

- high moisture in headspace,
- high organic and clay levels in soil,
- dissolved organics in water,
- age or degree of weathering of the contaminant, and
- temperature variations.

High soil moisture and high organic and clay levels in soil can limit the amount of volatile contaminants that will volatilize into the container headspace. The presence of dissolved organics in water can also reduce volatilization of contaminants. High levels of organics in soil may also produce methane, a natural gas that conflicts with TOV readings in flame ionization detectors (FIDs). Contaminants that are weathered contain fewer volatile constituents because they have already volatilized to varying degrees over time; therefore, volatile contaminant concentrations may be lower than would be expected with a fresh product release. Temperature variations during VOC volatilizations could affect the amount of vapors that form in the headspace.

Before beginning a jar headspace program, the PID should be calibrated per the manufacturer's specification. A measurement of background levels of organic vapors at the Mill Property should also be obtained. Taking these levels into account when interpreting headspace measurements will prevent false readings.

It is important to note that measurements obtained using portable vapor/gas detectors such as a PID or FID are considered qualitative and not quantitative data. This type of data is sufficient for stating the general presence of contamination in basic levels (low/medium/high) and for determining site health and safety. This type of data should not be used to identify specific contaminants or to determine whether a sample is "clean."

Headspace for Soil Samples

The following procedures should be followed for jar headspace measurements of soil samples. Note that a resealable plastic bag may be substituted for clean jars. Headspace sample collection should occur immediately after the soil is exposed to air to prevent volatilization. Headspace analysis should be completed on the same working day that the sample is collected.

1. Check battery charge level. If in doubt, charge battery as described in manual. Battery should typically be recharged daily after use.

2. Turn unit on. DO NOT look into sensor (ultraviolet radiation hazard). The probe or pump should make an audible sound (whine or click), confirming operation.

3. Perform zero and span calibration procedures as described in operating manual. Calibration for specific compounds can be performed so instrument response is proportional to the calibration gas concentration. Isobutylene calibrant is available, and response factors for other compounds are provided in the instrument manual.

4. Consult the operation manual reference for ionization potentials and response factors for common compounds. The PID does not detect methane and many compounds with an ionization potential greater than the lamp energy (typically about 10 eV).

5. If so equipped, set alarm at desired level.

6. Verify the unit is calibrated and ready for use.

7. Put on nitrile or other sterile gloves. Fill two clean glass containers half-full with the sample to be analyzed. Quickly cover each open top with one sheet of clean aluminum foil (shiny side up) then apply screw caps to tightly seal the jars. The type and size of the jar or plastic bag, as well as the amount of sample collected, should be consistent for all samples collected at a site.

8. Allow headspace development for at least 10 minutes. Vigorously shake jars for 15 seconds both at the beginning and end of the headspace development period. Where ambient temperatures are below 32°F (0°C), headspace development should be within a heated vehicle or building. Samples should not be allowed to sit so long that condensation forms in the container.

9. After headspace development, remove screw lid/expose foil seal. Quickly puncture foil seal with instrument sampling probe, to a point about one-half of the headspace depth. Exercise care to avoid uptake of water droplets or soil particulates.

    - Headspace samples can also be withdrawn with a syringe, then injected into an instrument probe or septum-fitted inlet. This method is acceptable contingent upon verification of methodology using a test gas standard.

10. Following probe insertion through foil seal and/or sample injection to the probe, record highest meter response as the jar headspace concentration. Using the foil seal/probe insertion method, maximum response should occur between 2 and 5 seconds. Erratic meter response may occur at high organic vapor concentrations or conditions of elevated headspace moisture, in which case headspace data should be discounted.

11. The headspace screening data from both jar samples should be recorded and compared; generally, replicate values should be consistent to plus or minus 20%.

12. PID and FID field instruments shall be operated and calibrated to yield total organic vapors in parts per million (ppm). PID instruments must be operated with an appropriate eV (+/-) lamp source. Operation, maintenance, and calibration shall be performed in accordance with the project QAPP.

13. Instrumentation with digital (LED/LCD) displays may not be able to discern maximum headspace response unless equipped with a maximum hold feature or strip-chart recorder.

14. Deviations, departures, and/or additions to the above procedures should be documented in the field logbook.

15. Regularly clean and maintain instruments and accessories to ensure representative readings.

16. As with any field instrument, accurate results depend on the operator being completely familiar with the operator's manual for unit use.

17. The PID may be capable of recording readings at a determined rate which are logged and downloaded to a computer. Refer to manual for instructions on how to use this feature.

SOP NO. 3

Borehole Logging

SOP No. 3
Borehole Logging

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) was prepared to provide general guidance for field personnel in the method for describing soil samples from soil borings and soil grab samples.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of this SOP is to facilitate the acquisition of uniform descriptions of soils encountered during borehole programs and to promote consistency in the logging practices used by field personnel. Borehole logging is the systematic observation and recording of geologic and hydrogeologic information from subsurface borings and excavations. Soil and sediment sample descriptions provide geological information useful for a hydrogeological or geotechnical evaluation of a site.

This SOP provides guidance on procedures that are generally consistent with standard practices used to classify soils. Modified Unified Soil Classification System (USCS) classifications should be used to identify, classify, and describe soils.

1.3 Field Equipment and Supplies

Material/equipment typically required for classifying soils and preparing boring logs may include the following:

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms, boring logs
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- USCS table and classification chart
- Soil color chart (i.e., Munsell[1]).
- Sand grading chart
- Pocket penetrometer
- Dilute hydrochloric acid (HCl[2])
- Deionized water in squeeze bottle
- Hand lens
- Pocket knife, spoon, and/or a small spatula
- Measuring device (cloth measuring tape, folding ruler, or yard stick)
- Portable table
- Polyethylene sheeting
- Digital camera and photograph placard
- Graph paper
- Engineer's scale
- Aluminum foil, Teflon sheets
- Photoionization detector (PID) and supplies (SOP-2)
- Sample shipping and packaging supplies (SOP-4)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Previous project reports and boring logs (if available)

[1] If used, the edition of the Munsell chart should be specified on each borehole log as the color descriptions and hue, color values, and chromas have changed between editions. Whenever possible, use the latest version of Munsell's color charts as of color chips fade over time.

[2] Verify that the safety data sheet [SDS] for HCl is included in the project HASP.

- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 SOIL PROCEDURES

Soil classification and borehole logging should be conducted by a qualified geologist or other personnel trained and experienced in the classification of soils.

Soils are typically logged in conjunction with advancing boreholes and sampling subsurface soils. Although this SOP focuses on classifying soil samples obtained from boreholes, this particular procedure also applies to soils collected using other techniques (e.g., post hole digger, scoop, and excavation).

The general description of a soil sample should include the following:

1. Group name and symbol per ASTM International (ASTM) Standard D 2488-09a
2. Color
3. Moisture content
4. HCl reaction
5. Grain size, angularity and particle shape
6. Relative percentage (fines, sand, gravel)
7. Plasticity
8. Density
9. Structure
10. Geologic modifiers
11. Other (e.g., mineralization, staining, odor)

As part of the preliminary identification, soil is fine-grained if it is comprised of greater than (>) 50% of fines (clay and silt); a soil is coarse-grained if it is comprised of less than (<) 50% fines.

The standard description format for a coarse-grained soil is as follows.

Grading term, group name and grain distribution; color; moisture conditions; particle size range; angularity; gradation; relative percentage; HCl reaction; density; structure; geologic modifiers; other.

Example: Silty Sand with Gravel (SM) – Light brownish gray (10YR 6/2); moist; fine- to medium-grained sand with fine subangular to subrounded gravel; (20, 60, 20); weak reaction to HCl; low plasticity; medium dense; weak cementation; iron-oxide staining.

The standard description format for a fine-grained soil is as follows:

Grading term, group name and grain distribution; color; moisture condition; grain-size range; angularity; gradation; relative percentage; HCl reaction; plasticity; structure; geologic modifiers; other.

Example: Lean CLAY with Sand (CL) – Light brownish gray (10YR 6/2); moist; low plasticity; stiff; weak reaction to HCl; with fine subangular to subrounded sand; (80, 20 ,0); weak cementation; trace iron-oxide staining and rootlet casts.

2.1 Group Name and Symbol

The USCS classification (symbol) is based on the percentages of each grain size present in the soil and determined using the table below. Field personnel should have this table for reference while logging soil borings.

Coarse Grained Soils (more than half of soil > No. 200 sieve)	Gravels (More than half of coarse fraction > no. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Sandy gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-silt mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
Fine Grained Soils (more than half of soil < No. 200 sieve)	Silts and Clays LL = < 50	ML	Inorganic silts and very fine sands, rock flour, silty fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
	Silts and Clays LL = > 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic silts of high plasticity, fat clays
		OH	Organic clays of high plasticity, organic silty clays, organic silts
Highly Organic Soils		Pt	Peat and other highly organic soils

The first step to create a written description of the grain sizes and determine the USCS symbol is to determine if the soil consists primarily of coarse-grained soil (gravel and sand) or fine-grained soil (silt and clay).

- Sand grains range in size from just visible to the naked eye to about the size of a pea.
- Gravels range in size from the size of a pea to 3 inches in diameter.
- The individual grains of clay and silt ("fines") are not visible to the naked eye.

Estimating the relative percentages of clay versus silt in the field can be accomplished using several field techniques. These techniques are described in Section 2.1.1.

2.1.1 Fine-Grained Soil

If the soil is fine grained, determine if there is more clay or silt. If there is more clay than silt, then the soil will be logged as a clay. If there is more silt than clay, then the soil will be logged as a silt. As indicated above, the individual grains of clay and silt ("fines") are not visible to the naked eye. The soils are classified as silts or clays based on the results of two lab tests: the plasticity index and the liquid limit. In rare cases, the fines are classified as silty clay (CL-ML) based on the results

of the lab tests (when the plasticity index is ≥4 and ≤7 and plots on or above the "A" line on the plasticity chart). During soil logging, the results of the lab tests can be estimated by conducting a series of field tests. These techniques are described in Section 2.1.2.

For Silt:

1. If the soil is a silt, it should be logged as an ML (silt with low plasticity), an MH (silt with high plasticity), an OH (organic silt with high plasticity) or an OL (organic silt with low plasticity).

2. If the soil contains between 15 and 30% coarse-grained particles, the words "with Sand" or "with Gravel" should be added to the group name (e.g., SILT with Sand or SILT with Gravel).

3. If the soil contains greater than 30% coarse-grained particles, the words "Sandy" or "Gravelly" should be added to the group name (e.g., Sandy SILT or Gravelly SILT).

For Clay:

1. If the soil is a clay, it should be logged as a CL (lean CLAY with low plasticity), CH (fat CLAY with high plasticity), OH (organic CLAY with high plasticity), or OL (organic CLAY with low plasticity).

2. If the soil contains between 15% and 30% coarse-grained particles, the words "with Sand" or "with Gravel" should be added to the group name (e.g., CLAY with Sand or CLAY with Gravel).

3. If the soil contains greater than 30% coarse-grained particles, the words "Sandy" or "Gravelly" should be added to the group name (e.g., Sandy CLAY or Gravelly CLAY).

For environmental boring logs, it is not necessary to state "lean" or "fat" in the soil description. These descriptors are implied in the USCS symbol which immediately follows the grain size description.

For Peat:

A final USCS symbol (PT) should be used if a highly organic soil (peat) is encountered.

2.1.2 Manual Tests for Fine-Grained Soil

For visual classification, some simple manual tests are performed to evaluate the plasticity characteristics of the soil. These tests take the place of the Atterberg limits tests used in the laboratory classification method. The manual tests for dilatancy, plasticity, and crushing are performed as described below. While performing these manual tests, other visual and tactile tests are used to further narrow the classification. The results of these tests determine which of the group

classifications for fine-grained soil apply. The same procedures are used to identify the fine-grained fraction of coarse-grained soils to determine whether they are silty or clayey.

The laboratory tests for identifying fine-grained soils are performed on that fraction of the soil finer than the No. 40 sieve size (about 0.5 mm). The first step in performing the manual tests is to select a representative sample and remove (by hand) particles larger than the No. 40 sieve size. If there is a substantial portion of sand greater than the No. 40 sieve size remaining, judgment is required. The expected manual test results may need to be "adjusted" upwards to compensate for high sand contents.

Listed below are manual tests used to help visually classify fine-grained soils. In practice, several of these take only seconds; they are not tests per se, but observations to make while preparing a specimen and significantly add to the ability to classify properly.

- Ease of Water Addition (Test 1): Add enough water to the sample to make the soil soft but not sticky. Note the ease at which water is absorbed into the sample. Samples that absorb water easily or very easily tend to be low-plastic silts; soils in which it is difficult to form a homogeneous blend tend to be high-plastic clays. If other tests indicate a highly plastic material, but water is easily blended, consider an MH (elastic silt). If other tests indicate a low-plastic material, but water is of medium difficulty to blend, consider a CL (lean clay). Record findings on a scale of very easy to very hard.
- Dilatancy (Test 2): Dilatancy describes the soil's reaction to shaking. Place the ball in the open palm of one hand. Either keep it as a ball or smear it to form a pat in the palm (this helps keep the ball from rolling off). Shake the sample by striking the free hand against the sample hand vigorously several times. A positive reaction consists of the appearance of water on the surface of the ball/smear and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the sample stiffens, and may crack or crumble. The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil.

The reaction to shaking and squeezing can be classified as very rapid, rapid, medium, slow, or none, approximately in conformance with the criteria below. The less dilatant a material is, the more likely the material is a clay rather than a silt.

Descriptive Term	Criteria
None	No visible change in the specimen.
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing. In other words, some change is observed, but it isn't obvious.
Medium	In between rapid and slow.

Descriptive Term	Criteria
Rapid	After several strikes, water appears on the surface of the specimen during shaking and disappears upon squeezing.
Very Rapid	After only a few strikes, water appears on the surface of the specimen and disappears readily upon squeezing. Generally, specimens with a fair content of sand or non-plastic silts.

- Amount of water to exceed the liquid limit (Test 3): If there is sufficient moisture in the sample, that it is near the liquid limit, then there may be a noticeable change after shaking the sample, with the soil giving the appearance of being dilatant even when it is not. Hence, this, like the other tests, is not conclusive by itself. In the course of preparing the sample for the dilatancy test, it may be that it did not take too much water for it to become "soup like" or too wet to become useful as a ball specimen. In general, the smaller amount of water it takes before it is "too much," the lower the plasticity index will be, and the more likely it is a silt rather than a clay. In practice, if it doesn't take much water, lean towards ML (inorganic silt). If add a lot of water can be added without overdoing it, lean toward CH (fat clay), with the other classifications in between. Record findings on a scale of very small to very large.
- Stickiness of materials (Test 4): Plasticity relates to the behavior of soil as it approaches the plastic limit. Plasticity may present as stickiness of a wet soil. In the course of performing the dilatancy tests above, note how sticky the material feels. A truly non-cohesive material (plasticity index of 0) will not feel sticky at all. This will always be a silt by definition, and almost always classify as an ML (inorganic silt). However, ML (inorganic silts) soil can have some stickiness too. Classify the stickiness as very low to very high; the greater the stickiness, the higher the plasticity index[3].
- Size of thread (Test 5): Mold a ball of soil about 1 inch (30 mm) in diameter to the consistency of putty. If too dry, water must be added; if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. From a practical viewpoint, if done after the dilatancy test, the specimen will be on the wet side and additional water is rarely needed. The specimen is then rolled out by hand into a thread (or "worm"). Roll the thread to about 5 mm in diameter, then continue to roll the thread in an attempt to make as thin a thread as possible. Very thin threads (<3 mm) are a sign of higher plasticity. Quickly remold the thread and try it again. If very thin threads can continue to be made, the soil will typically be highly plastic. Threads that come apart when rolled into a ball tend to be of lower plasticity. The more repeatable the threads, the more likely it is a clay rather than a silt. Record findings on a scale of medium (5 mm) to very thin (< 3mm).

[3] In the laboratory test for plastic limits, soil is rolled into a thread about 1/8 inch (3 millimeter [mm]) in size. It is then reworked and rerolled, which lowers the soil moisture content. The plastic limit is determined when the threads begin to crack and break when they are exactly 1/8 inch in diameter. In typical field classifications, there is no time for this exactitude, and moisture contents are unknown. Hence, other qualitative measurements are used instead.

- Perceived plasticity of threads (Test 6): In the course of rolling threads above, note the general plasticity of the threads. For example, if is possible to roll a very thin thread in a low plastic silt if one is very careful, applying light pressure to the soil to mold it and being gentle with the thread. Alternatively, a very thin CH (fat clay) thread can be roughly treated, even picked up off the hand and "wiggled or shaken" about. Classify the perceived strength of the threads as non-plastic, slight, low to medium, or medium to high plasticity.
- Intergranular friction (Test 7): In general, the more plastic a soil is, the more it will hold together under applied stress. This tendency can be used to further aid in soils classification. Mold a ball about 1 inch (30 mm) in diameter at the consistency of putty. Take the ball and squish it between your thumb and forefingers. Some pieces of sand may be felt in the sample. Ignore these and concentrate on the fine-grained portion of the soil. Typically, clays feel like a smooth, paste-like putty when squished. Silts tend to have a feeling of grittiness or inter-granular friction to them. Classify the amount of intergranular friction as very low, low, medium, or high. In order of decreasing grittiness, soils would be ML to MH to CL to CH. In practice, this tends to be most useful when differentiating between an MH (elastic silt) and a CH (fat clay) soil. While there is not a comparable laboratory test, it is consistent with the theory that clays are "colloidal," and silts are very small "sands."
- Cracks in the ball (Test 8): Remold the material from Test 7 into another ball. With your thumb of your free hand, push down in the center of the ball and observe the cracks that form around the center. Classify the number or cracks as many, some, few, or none. The fewer the cracks, the greater the soil "sticks" together and the more plastic and clayey the soil tends to be. In practice, the number of cracks visible is highly dependent on the water content of the soil in the ball. A highly plastic clay that is near its plastic limit can exhibit a larger number of cracks than a low plastic clay closer to its own liquid limit.
- Dry ball crush strength (Test 9): Remold the material from Test 8 into a ball and let it dry[4]. Test the strength of the dried ball by breaking and crumbling it between the fingers and describe the result in accordance with the table below. This test can also be performed on natural (not remolded) samples. Do not use natural lumps containing particles of coarse sand. The dry strength increases with increasing plasticity, in accordance with the table below.

[4] This test takes time to dry the sample, and a secure place to put samples is needed. This can be used to check a sample collected at the start of drilling then tested for dry strength upon completion of the boring. If dry, the strength test can be used to confirm the estimated classification based on the other tests. The strength test is also dependent on the amount of water in the sample before drying, the method of drying, and to some extent the amount of kneading that has occurred to develop the ball.

Descriptive Term	Criteria
Very low	The dry specimen crumbles into powder with mere pressure of handling.
Low	The dry specimen crumbles into powder or crumbles with some finger pressure.
Medium	The dry specimen breaks into pieces or crumbles with considerable finger pressure.
High	The dry specimen cannot be broken with finger pressure. Specimen will break into pieces between thumb and a hard surface.
Very High	The dry specimen cannot be broken between the thumb and a hard surface.

- Relative dirtiness / difficulty cleaning (Test 10): While not scientific, the relative dirtiness of the hand and the difficulty in cleaning up can also be used as an indication of the relative plasticity of the material. In general, silts clean up easily, washing off the hands sometimes with just being submerged in water. CH (fat clays); however, often take a fair amount of scrubbing, rubbing, or wiping on paper towels. In general, the dirtier the hands and the more difficult they are to clean, the more the soil is likely to be a clay and/or the more likely the soil is highly plastic. Record findings on a scale of very low to very high.

Below is a summary of the potential results from the tests listed above and their application for characterization of fine grained soil.

Quick Reference for Qualitative Test Results

Soil Type	Ease of water addition	Dilatancy	Amount of water to exceed liquid limit	Stickiness of material	Size of possible threads	Perceived plasticity of threads	Inter-granular friction	Cracks in ball test	Dry ball crush strength	Relative dirtiness / difficulty cleaning
	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 10
Silts (ML)	Very easy to easy	Very rapid to rapid	Small	Very low to low	Medium (1/8 inch) to thin	non plastic	Medium to high	Many	Very low to low	Very low to low
Clays (CL)	Easy to medium	Slow to medium	Small to medium	Low to high	Generally thin	low to medium plasticity	Low to very low	Some to few	Low to high	Low to medium
Silts (MH)	Easy to medium	Medium to slow	Medium to very large	Medium to very high	Thin to very thin	Slight plasticity	Low to medium	Few to none	Medium to high	Low to high
Clays (CH)	Medium to very hard	Slow to none	Medium to very large	High to very high	Very thin	medium to high plasticity	Very low	Few to none	High to very high	Medium to very high

2.1.3 Coarse-Grained Soil

If the soil is coarse grained, determine if there is more sand or more gravel. If there is more sand than gravel, then the soil will be logged as a sand. If there is more gravel than sand, then the soil will be logged as a gravel. Grain size thresholds for coarse grained soil classifications are presented below.

Grain Size Categories

Particle	Subdivisions	U.S. Standard Sieve	Size (mm)
Boulders	---	---	Over 305
Cobbles	---	---	305 to 75
Gravel	Coarse	< 3” to 3/4”	> 75 to 19
	Fine	<3/4” to No. 4	> 19 to 4.76
Sand	Coarse	< No. 4 to No. 10	> 4.76 to 1.68
	Medium	< No. 10 to No. 40	> 1.68 to 0.42
	Fine	< No. 40 to No 200	> 0.42 to 0.074

For Sand:

1. If the soil is a sand and there are less than 5% fines, the soil will be logged as an SP (poorly-graded SAND) or an SW (well-graded SAND). See below for discussion regarding poorly versus well graded.

2. If the soil is a sand with greater than 12% fines, the soil will be either an SM (Silty SAND) or an SC (Clayey SAND). If the fines are a silty clay (see below), the soil will be a Silty, Clayey SAND (SC-SM). Per the USCS, there is no clayey silt classification for fines.

3. If the fines are between 5% and 12%, then a dual classification symbol should be used:

    - SP-SM for a poorly graded SAND with Silt
    - SP-SC for a poorly graded SAND with Clay
    - SW-SM for a well graded SAND with Silt
    - SW-SC for a well graded SAND with Clay

If the soil is predominantly sand, but contains 15% or more of gravel, the words "with Gravel" should be added to the group name (e.g., if a soil contains 20% gravel, 50% sand, and 30% fines [assume silt], the soil is a Silty SAND with Gravel).

Sand should be further described with the predominant grain size. The sizes are fine (just visible to naked eye to sugar size), medium (sugar size to rock salt size), or coarse (rock salt size to pea size). If a sand contains equal amounts of both fine- and medium-grained sand particles, simply refer to it as a fine to medium sand. As a general rule, do not include the grain size when there is 10% or less of that size present in the sand. For example, if the sand fraction comprises 10% fine sand, 60% medium sand, and 30% coarse sand, describe the soil as a medium to coarse sand.

For Gravel:

1. If the soil is a gravel and there are less than 5% fines, the soil will be logged as a GW (well-graded GRAVEL) or a GP (poorly-graded GRAVEL).

2. If the soil is a gravel with greater than 12% fines, the soil will be either a GM (Silty GRAVEL) or a GC (Clayey GRAVEL).

3. If the fines are between 5% and 12%, then a dual classification symbol should be used as follows:

    - GP-GM for a poorly graded GRAVEL with Silt
    - GP-GC for a poorly graded GRAVEL with Clay
    - GW-GM for a well graded GRAVEL with Silt
    - GW-GC for a well graded GRAVEL with Clay

If the soil is predominantly gravel but contains 15% or more sand, the words "with Sand" should be added to the group name (e.g., GRAVEL with Sand).

Gravel should be further described as fine (pea size to thumb size) and/or coarse (thumb-size to fist size) with the % of each estimated.

Poorly Graded versus Well Graded

If the coarse-grained soil has 12% or less fines, the coefficient of uniformity (Cu) and the coefficient of curvature (Cc) are computed based on the results of a cumulative particle-size distribution curve to determine whether the sand or gravel should be classified as poorly graded or well graded. The calculations are based on the particle-size diameters corresponding to 10, 30, and 60% passing on the distribution curve. Because we are unable to prepare a distribution curve in the field, we estimate the results of the calculations by evaluating whether the soil consists of: (1) predominantly one size (poorly graded) or a range of size with some intermediate sizes missing; or (2) a wide range of particle sizes and substantial amounts of intermediate particle sizes (well graded). For environmental boring logs, it is not necessary to state, "poorly graded" and "well graded" in the soil description. These descriptors are implied in the USCS symbol which immediately follows the grain-size description.

2.2 Color

Color value of a moist soil should be assigned using the Munsell® Color Chart, including the Munsell Color Name Diagram (e.g., dark gray [7.5YR 4/1]). The presence of mottling should be included in the description, where present. Record in field notes if the soil color description is for a dry soil.

2.3 Moisture Content

Moisture content should be described using the following modifiers, per ASTM D 2488-09a:

- Dry – absence of moisture, dusty, dry to the touch
- Moist – damp but no visible water
- Wet – visible free water

2.4 Grain Size

Describe the grain size of the soil relative to Sections 3.1. of ASTM D2488-09a. A 200 mesh sieve can be used to help distinguish between fines (clay and silt) and sand-sized particles. The table below summarizes the particle size ranges to be used for describing sands, gravels, cobbles, and boulders.

2.5 Angularity and Particle Shape

Angularity or Rounding: These are geologic terms that are used to describe the general appearance of visible grains in the soil sample and are useful in determining the origin and

depositional environment of a material. Water-transported material may be rounded. Glacial tills will be more angular. The following terms describe differing degrees of angularity:

- Angular–particles have sharp edges and relatively plane sides with unpolished surfaces
- Subangular–particles are similar to angular description but have rounded edges
- Subrounded–particles have nearly plane sides but have well-rounded corners and edges
- Rounded–Particles have smooth curved sides and no edges

Particle Shape: A term used to describe the shape of gravel, cobbles, and boulders. The following terms are used to describe the particle shape, where the length, width, and thickness refer to the greatest, intermediate, and least dimensions of a particle:

- Flat–particles with width/thickness ratio > 3
- Elongated–particles with length/width ratio > 3
- Flat and elongated–particles meet criteria for both flat and elongated

2.6 Distribution

Use the following nomenclature to quantify proportions of large gravel, organics, or non-geologic material:

- Trace: 5%
- Few: 5–10%
- Little: 15–25%
- Some: 30–45%
- Mostly: 50–100%

For example, a soil may be described as having few shell fragments, or some wood fragments.

2.7 HCl Reaction

Reaction to HCl should be described as either none, weak, or strong based on the following criteria, per ASTM D2488 – 09a:

- None–no visible reaction
- Weak–some reaction; bubbles forming slowly
- Strong–violent reaction; bubbles forming immediately

2.8 Plasticity

For fine-grained soils (clay and silt), the plasticity of a soil is to be described based on observations made during the toughness test, as described in Section 14.4 of ASTM D 2488-09a. Criteria for describing plasticity is summarized in the table below.

Criteria for Describing Plasticity	
Description	**Criteria**
Nonplastic	A 1/8-inch thread cannot be rolled at any water content.
Low	A thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

Source - ASTM D2488-09a: Standard Practice for Description and Identification of Soils

Additional criteria for describing dry strength, dilatancy, and toughness are included in ASTM D2488-09a and can be used in the field for distinguishing between silt and clay. The field geologist/engineer should be familiar with these techniques prior to logging soil in the field.

2.9 Density and Consistency

For cohesionless soils, density should be based on the sum of the number of blows with a 140-pound hammer to advance the sample barrel 12 inches of an 18-inch split spoon. Professional judgement should be used when applying the density modifier. If high blow counts are due to the presence of a cobble, boulder, or large piece of gravel that impedes forward progress of the split spoon, density should be based upon the character of the material in the split spoon, if any, or omitted from the description. A notation should be made in the sample description when this situation occurs. Appropriate modifiers are described in the following table.

Cohesionless Soil - (Sands or Gravels)	
SPT (blows/foot)	**Description**
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
> 50	Very Dense

Notes: SPT: Standard Penetration Test; Source: *Caltrans Manual* (2010)

For cohesive soils, a pocket penetrometer (or a thumb impression) can be used to measure density of the soil. The tests are to be conducted on a relatively undisturbed sample and the density should be described per the following table.

Cohesive Soil - (Silts and Clays)		
PP (tsf)	**Description**	**Thumb Penetration**
PP < 0.25	Very Soft	Soil is easily penetrated several inches by thumb. Exudes between thumb and fingers when squeezed in hand.
0.25 ≤ PP < 0.5	Soft	Soil is easily penetrated 1 inch by thumb. Molded by light pressure.
0.5 ≤ PP < 1	Medium Stiff	Soil is penetrated over 1/4 of an inch by thumb with moderate effort. Molded by strong finger pressure.
1 ≤ PP < 2	Stiff	Soil is indented about 1/4 of an inch by thumb but penetrated only with great effort.
2 ≤ PP < 4	Very Stiff	Soil is readily indented by thumbnail.
4 ≤ PP	Hard	Soil is indented with difficulty by thumbnail.

Notes: PP: pocket penetrometer measurement; tsf: tons per square foot; Source: *Caltrans Manual* (2010])

2.10 Structure

Sedimentological descriptions aid in the geologic classification of a soil material. The following modifiers can be used for intact samples.

Stratification: Note the presence and thickness of alternating layers of materials of different grain sizes and/or color with layers at least 6 mm thick.

Lamination or Varves: Note the presence and thickness of alternating very thin layers of fine materials or color, such as silt and clay, with layers less than 6 mm thick.

Fissured: Breaks along definite planes of fracture with little resistance to fracturing.

Slickensided: Fracture planes appear polished or glossy, sometimes striated.

Blocky: Cohesive soil that can be broken down into small angular lumps which resist further breakdown.

Lensed: Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

Homogeneous: Material has the same color and textural or structural appearance throughout.

2.11 Contacts

In the graphic log portion of soil boring logs, contacts between two different soil types should only be depicted when the USCS classification (symbol) changes. When the contact is sharp and known precisely, it should be shown with a straight line. When the contact between two soil types is gradational, a diagonal line should be used over the interval in which it grades. If the contact depth is unknown (i.e., a clay is encountered at 5 feet and a sand at 10 feet), use professional judgement to estimate where the contact occurred. At times, the driller may be able to provide helpful information, such as when a coarse sand or gravel layer was first encountered. When a contact is inferred, it should be a dashed line.

2.12 Geologic Modifiers

Sorting (Grading): A geological term used to describe how close in size the grains in a sample are to each other. For example, a well sorted (poorly graded) sample contains grains of similar size; a poorly sorted (well graded) sample contains grains of many sizes.

Cementation: Cementation of soils for intact samples can be described as

- weak–crumbles or breaks with handling or little finger pressure;
- moderate–crumbles or breaks with considerable finger pressure; or
- strong–will not crumble or break with finger pressure.

Identification of Peat: A sample composed primarily of vegetable tissue in various stages of decomposition that has a fibrous to amorphous texture, usually a dark brown to black color, and an organic odor. When present, the sample shall be designated as highly organic soil.

Geologic Description: Where possible based on existing site data, local research, or geologic understanding of the local region, include a geologic description of the sample. Examples include till, fluvial, glaciofluvial, fill material, or Puente Formation. Do not use a geologic description if not certain.

2.13 Other

Evidence of contamination typically consists of observations such as unusual odors (hydrocarbon or solvent odors) or staining (i.e., “dark staining present”). If no evidence of contamination is noted, state this on the boring log (“no staining or unusual odors”).

Staining: Describe the staining if organic or unusual.

Odor: Describe the odor if organic or unusual. Soils containing a significant amount of organic material have a distinct odor of decaying vegetation. Always use appropriate breathing zone air monitoring equipment as specified in the site-specific HASP.

Mineralization: Describe the mineralization present (e.g., mica, gypsum, and carbonates).

Roots: For intact samples, describe if roots or rootlets or root holes are visible and if mineral coated.

Caving: Note if soil is caving or sloughing, if visible.

Fill: Fill material can be identified based on debris fragments (concrete, metal, glass, wood fragments, etc.).

Sheen: Describe the color (e.g., rainbow or colorless), shape (e.g., streaks, florets), and coverage (e.g., trace, some).

SECTION 3 ROCK PROCEDURES

The general description of a rock sample should include the following:

1. Formation/Unit designation, if known
2. Rock type and name
3. Texture (grain size)
4. Stratification/foliation/structure
5. Color
6. Weathering/alteration
7. Rock hardness
8. Strength
9. Fracture density and condition
10. Rock quality designation
11. Presence of groundwater or seeps
12. Additional comments

Before beginning, don PPE and perform air monitoring per the HASP. If coring, once the core is recovered from the borehole and removed from the core barrel, it should be placed in a 1/2 core sleeve (a “trough”) such that the total length of core run can be measured, core run recovery percent can be calculated, rock quality designation (RQD) can be measured, and the core photographed. Each core run will be photographed under natural lighting prior to being transferred to a core box for transport, photo documentation, and storage.

When logging rock where more than one rock type is present, describe each one separately. Start the description from the top of the sample interval, and log each change in stratigraphy in sequence to the bottom of the sample interval. Provide an interval or length (i.e., 0 to 0.5 foot) at the

beginning of each separate sequence description, followed by a colon. Draw a line below the bottom of complete sample descriptions.

3.1 Logging

Once the rock material has been recovered from the sample interval, describe the rock per Section 2.6 of the Caltrans Manual[5]. Deviations from the procedure should be documented in field notes.

SECTION 4 CORE PHOTOGRAPHY

Each core run will be photographed under natural lighting prior to disposal. The core should be placed with the shallowest end of the core on the upper left with subsequent sections of the core placed below as each of the rows below. Each core will be marked with the borehole identification and depth and the beginning of each core run will be marked with a wooden block or other label.

The following procedure should be used for photo documentation of core samples:

1. Clean the surface that the core is sitting on such that it is free of debris and excess soil/rock, and the cores are clearly visible without clutter. Cores should be photographed in natural light; however, if artificial light is needed, position the light such that it is diffused and covers the whole core.
2. Place a tape or ruler along the bottom edge of the core box, place the gray card and color checker card (if available) alongside the tape or by the side of the core, then orient the gray card toward the direction of the incident light.
3. Place the white board or photograph placard above the core box with the following information written in dry erase ink: date; project name or number; borehole identification; depth interval.
4. Position the digital camera immediately above the core at a height that accommodates the entire core box in the image (both vertically and horizontally) and captures the measuring tape or ruler, gray card, and color checker card without obscuring any of the core. The exact height will vary depending on the size of the core and camera optics; however, effort should be made to maintain consistent light for photographs of core from the same location.
5. Confirm that neither the camera nor the photographer is casting a shadow on the core box, and no distortion is present due to lens optics. Focus the camera and then take the picture.
6. Review the image on the digital camera to confirm that the image is clear and focused, no shadows are present on the core, and the colors are representative of the core. If the image is not satisfactory, repeat Steps 4 and 5 until an adequate image is obtained.

[5] State of California Department of Transportation Division of Engineering Services Geotechnical Services (Caltrans). 2010. *Soil and Rock Logging, Classification, and Presentation Manual*.

7. Save the image to the camera as a .jpeg or jpg file, and if available, a raw image file (e.g., a CR2 file). Do not reduce the file size of the image at this stage.
8. Record the date, time, sample identification, and core number on field forms or logbook.
9. If multiple core samples are being photo documented, remove the first core and replace with the next core to be photo documented, and repeat Steps 2 through 8.
10. After collecting the core sample photo documentation, download the images and save without reducing the file size of the images. Do not delete the images from the camera until the images saved to the computer have been backed up to a second storage device.
11. After the images have been saved to a computer and backed up, the images may be deleted from the camera.
12. The file size of the photo documentation may be altered for use in reports; however, the original image file (jpeg/RAW/CR2) must be left unaltered. The gray card and color checker card in each image may be used for post-processing white balance, although most digital cameras will automatically control color. The color checker card may be used for color confirmation.

SOP NO. 4

Soil Sampling

SOP No. 4
Soil Sampling

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) was prepared to direct field personnel in logistics, collection techniques, and documentation requirements for collecting surface and subsurface soil samples. Soil samples will be obtained via the use of hand tools or drilling.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective is to obtain representative samples of soil for laboratory analysis at discrete locations and depths. This objective requires that the sample be both free of unsuitable material and be of sufficient quantity and quality for analysis by the selected analytical method.

1.3 Field Equipment and Supplies

The materials listed below should be available, as required, during the subsurface soil sampling.

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP

- Sample containers as specified in the SAP/QAPP
- Sample preservation supplies: Cooler, ice, zip-top bags
- Paper towels
- Wooden stakes and/or spray paint (highly visible)
- Stainless-steel mixing bowls, spoons or trowels
- Photoionization detector (PID) and moisture traps
- Hand auger, shovel, or post-hole digger
- Measuring tape (100 foot ≤) or measuring wheel
- Drill rigs and associated drilling equipment and supplies (provided by the drilling contractor)
- Borehole logging equipment and supplies (SOP-3)
- Shipping and handling supplies (SOP-10)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

2.1 Pre-Mobilization Activities

- Obtain the depth, material, and map for locations to be sampled.
- Obtain a listing of the parameters that should be measured in the field or laboratory as part of this sampling program, including the required analytical method, name of the analytical lab, sample volume, sample nomenclature, preservatives, sample containers and holding time for each parameter per the QAPP.
- Obtain a listing of the frequency of duplicate, matrix spike/matrix spike duplicate, field blank, equipment blank and trip blank sampling as per the QAPP.
- Verify that equipment on order is being shipped to the determined destination.
- Verify that applicable drilling and well construction permits are complete.

2.2 Pre-Sampling Procedures

Several steps are required before sampling. These steps ensure that supplies and instruments are procured as needed, and instruments are functioning properly, for efficient and accurate sampling.

2.2.1 Sample Container Preparation

- Sample container procurement should be arranged with the various analytical laboratories several weeks prior to the event.
- Upon receipt of the cleaned sample containers from the laboratories, containers should be inventoried to verify that the laboratory has provided the correct number of containers of the proper size, and that they contain the correct preservative (if required).
- To the extent possible, sample containers should be pre-labeled/tagged and bundled for each location to avoid confusion during sample collection. Powder-free nitrile gloves should be worn whenever handling clean containers.
- Containers should be placed in clean coolers for transport to the field.

2.2.2 Equipment and Supply Inventory

- Field equipment that must be cleaned and supplied internally or by a vendor and should be ordered several weeks prior to the event.
- Verify that the correct equipment has been received and that it is clean (decontaminated) and calibrated.
- Verify that the appropriate PPE and ancillary supplies (e.g., paper towels, decontamination solution), as specified in the HASP, have been brought to the field site.

2.2.3 Underground Utility Location

Multiple efforts should be made to identify the location of underground utilities and features prior to any subsurface explorations:

- Markings for public underground utilities should be requested through the Washington Utility Notification Center ("Call before you dig") at least 1 week prior to subsurface exploration.
- A private utility locator should be procured to clear individual boring locations of underground utilities and subsurface features in advance of drilling work.
- The Mill facility operations teams should be consulted regarding institutional knowledge of underground utilities and subsurface features. In addition, facility maps and drawings may be reviewed, if available.

2.2.4 Mobilization

Field personnel shall mobilize to the Mill Property, meet at the designated rendezvous location (e.g., entrance gate), and follow Mill security check-in procedures. Field personnel will prepare for the sampling activities and mobilize to the target sampling locations. The following steps comprise the mobilization procedure:

- Assemble field equipment.
- Don appropriate PPE.
- Carefully maneuver the drilling rig to the sample station.
- Evaluate the area around the sampling location for safety concerns, hazards, adequate lighting conditions, and accessibility. Use workplace lighting as needed.
- Note any irregularities at the sampling location in the daily field report or the applicable field form, including modifications to sample locations or depths based upon field observations.

2.3 Surface Soil Collection

1. Measure and mark sampling locations prior to initiation of the sampling program, as specified in the SAP. If sampling locations are based on a grid pattern, stakes or paint can be used to define the grid layout.

2. If overlying soil is to be removed (as specified in the SAP), use shovels or post-hole diggers, as needed.

3. Collect soil samples by using a hand auger. Describe soils in accordance with SOP-3 and screen the soil core for volatile organic compounds (VOCs) analysis using the PID (SOP-2). Field data shall be recorded in the daily logbook and boring log. Collect sample soils for laboratory analysis per the SAP/QAPP.

4. Collect soil samples (Section 2.5).

5. Place the selected samples in appropriate containers and store them at approximately 4 °C per SOP-10.

6. Prior to each sampling event or location, decontaminate sampling equipment (SOP-11).

2.4 Subsurface Soil Collection Methods

Sonic drilling will be used to obtain soil cores for subsurface soil sampling. Borings are advanced by simultaneously driving decontaminated stainless steel casing into the ground. Upon reaching the desired penetration depth, the soil is extracted to collect the discrete subsurface soil samples.

The following procedures should be employed to collect subsurface soil samples:

1. Ensure that drilling locations are safe.
2. Don the appropriate PPE as specified in the HASP.
3. Set up an equipment cleaning station, and decontaminate reusable equipment as described in SOP-11. Use new, clean, disposable materials when decontamination is not appropriate (e.g., disposable gloves, sampling tubes, and dedicated drive points).
4. Drillers will assemble the tooling and drilling rods.
5. Drive the sampling tools to the appropriate sampling zone.
6. When the desired depth for the collection of a subsurface soil sample is reached, retrieve the soil core.
7. Log the soil core in accordance with SOP-3 and screen the soil core for volatile organic compounds (VOCs) analysis using the PID (SOP-2). Field data shall be recorded in the daily logbook and boring log. Collect sample soils for laboratory analysis per the SAP/QAPP.
8. Decontaminate non-disposable equipment or tools (SOP-11.)
9. Discard disposable equipment used during sampling activities in a designated location.
10. Abandon the borehole per state regulations.
11. Mobilize to the next boring location.

2.5 Soil Processing and Sample Collection

Based on core characteristics and field screening results, sample interval(s)/depth(s) will be determined, and soil sample(s) collected and placed in laboratory-provided containers for laboratory analysis per the QAPP. Note that many sample containers contain preservatives; hence it is necessary to fill each container carefully to avoid spilling, underfilling, or overfilling to maintain acceptable levels of preservative.

- Samples for volatile organic compound (VOC) analysis should be collected first as discrete samples from the selected soil/sediment core sample interval to prevent losses due to volatilization.
- The remaining material in the selected soil core sample interval should be homogenized by mixing with a decontaminated stainless steel bowl and spoon. Mixing will continue until the soil sample material is homogeneous in color and texture. The homogenized sample should be placed into appropriate sample containers per the QAPP. Materials more than 0.5-inches in diameter and debris should be omitted from the sample.

- If insufficient core material is available to fill containers required for the planned analyses, the field personnel will consult with the Project Manager to determine which analyses to prioritize.

2.6 Sample Disposition

Samples should be labeled, maintained in custody, and handled in accordance with the SOP-10.

2.7 Documentation

Field documentation includes completed boring logs, calibration records, and other field notes deemed relevant. It is essential that field forms be filled out completely and legibly at each location, and that entries are consistent for each location and among different personnel. Field documentation should be completed in accordance with SOP-1.

2.8 Decontamination of Boring Equipment

Boring and sampling equipment should be decontaminated in accordance with SOP-11.

2.9 Investigation-Derived Waste Management

Soil cuttings are to be contained on-site in an appropriate, labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as PPE, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain on-site. Refer to SOP-13.

SECTION 3 QUALITY CONTROL GUIDANCE

Quality control requirements specified in the SAP/QAPP, RI WP, and/or project-specific regulatory requirements shall be followed as applicable. These may include collecting additional samples for field duplicates, equipment-rinsate blanks, field blanks, or matrix spike/matrix spike duplicates. Samples may also need to be shipped with trip and/or temperature blanks.

SOP NO. 5

Well Construction and Development

SOP No. 5
Well Construction and Development

SECTION 1 INTRODUCTION

1.1 Overview

This SOP describes procedures used by field personnel for well construction and development following completion of boring and soil sampling procedures.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

This SOP describes the protocol to be followed during the installation of monitoring wells. Drilling and logging of soil borings for well installation should be in conformance other SOPs in this QAPP.

The objectives of well development are to remove sediment that may have accumulated during well installation, to consolidate the filter pack around the well screen, and to enhance the hydraulic connection between the aquifer and the well.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms

- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Surge block
- Stainless steel suction bailer
- Submersible pump
- Hydraulic jetting tool
- Water level meter
- Weighted measuring tape
- Stopwatch or timer
- Water quality meter and supplies (SOP-8)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

2.1 Monitoring Well Installation

The field geologist shall inspect and inventory the well construction materials prior to the start of well construction. If sufficient materials are not on-site or are in unacceptable condition, well construction will not begin until appropriate materials have been obtained.

The monitoring wells will be constructed from materials specified in the RI WP (e.g., 2-inch-diameter, flush threaded Schedule-40 polyvinyl chloride [PVC]). Well materials shall be new and clean and will remain wrapped (if delivered that way) until they are deployed in the borehole. Soiled materials will be cleaned prior to use, and decontaminated (SOP-11) if there is a potential that well materials contacted contaminated surfaces; well materials will be discarded and replaced if they cannot be cleaned. Prior to beginning drilling, drilling permits from the city or county are to be obtained; the field engineer/geologist will keep a copy of the permit on-site during the drilling/well installation activities.

2.2 Well Screen and Blank Casing

The well screen and blank casing will generally consist of threaded stainless steel or Schedule (SCH) 40 (minimum) or SCH 80 PVC pipe, although steel may be used. The casing material is defined in the well construction diagram provided in the RI WP. Only factory-manufactured screen and blank casing shall be used. Well screen and blank casing will be jointed through threaded connections equipped with O-ring seals; solvent welds are not suitable due to the potential for contamination from the solvent glue.

The well screen will generally consist of machine-slotted PVC or wire-wrapped stainless steel screen. The screened sections will provide flow between the target zone and the well, allowing efficient well development and representative sample collection.

Final screen slot size specifications may be selected after filter pack specifications have been selected as discussed in Section 3.3.

2.3 Filter Material

Filter material will be well-graded, clean sand with a specific gravity of at least 2.5. The filter material will be either a standard sand gradation designed for a range of anticipated soil types or a sand gradation specifically designed based on the grain-size distribution of soils collected from the anticipated well completion zone. If the latter approach is pursued, grain-size distribution analyses will be performed. The filter pack and well screen will then be designed using the methods defined in Chapter 13 of *Groundwater and Wells* (Driscoll 1986).

2.4 Setting Screens and Riser Casing

Upon completion of drilling and/or geophysical logging, the boring will be sounded with a weighted measuring tape to verify the total depth of the boring. Six inches of filter pack sand will be poured into the boring and allowed to fall to the bottom of the boring. The boring shall be sounded after placing the sand to verify its thickness.

The well casing and well screen will then be assembled in manageable lengths and each length attached as the well casing and screen are lowered into the boring; caution must be used so that materials (including the well casing and screen) do not accidentally fall down the well. While the well is being constructed, tension will be kept on the casing using a casing lifter and a rig auxiliary line. A ridge clamp vise may also be used to secure the well casing as annular materials are placed. Clean nitrile gloves will be used to handle well casing and other well construction materials.

Well casing materials will be measured to the nearest 0.1 foot. The bottom of the well screen will be fitted with a secure bottom end cap/silt trap of nominal length. No PVC cement or other solvents will be used to fasten the well casing joints, well screen joints, or end caps.

Stainless steel or PVC centralizers shall be used immediately above and below the well screen and at intervals no less frequent than every 50 feet along the length of the casing.

For borings drilled by the mud rotary method, potable water may be added to the drill mud and circulated in the borehole after completing the boring. Circulation will continue until the suspended sediment in the return fluid decreases. If borehole conditions are relatively stable, the mud will be thinned before the casing assembly is lowered into the specified depth. This is preferred because it reduces the potential for clogging the well screen with thick mud. Conversely, if borehole conditions are relatively unstable, the mud will be thinned after the casing is placed at the specified depth but prior to installing the annular fill materials. After installing the well assembly, a slurry of filter sand and potable water will then be tremmied into the annular space.

For borings drilled using the hollow-stem auger or sonic method, the filter sand will be placed after the well assembly has been lowered to the specified depth through the augers or drill pipe.

The augers or drill pipe will be incrementally raised as the filter sand is placed by free fall through the augers/drill pipe; increments of 1 to 2 feet are recommended. The depth to the top of the filter pack will be measured after each increment to detect possible bridging (bridging is the interlocking of sand particles between the well and boring, which results in a void in the well annulus). If bridging occurs, it will be broken by washing the filter materials into proper place with potable water, by repeatedly raising and lowering the augers slightly, or by tapping the bridge with a steel rod. The amount of water, if any, added to the borehole must be noted on the well completion log (attached). If “casing lock” occurs (i.e., the sand pack locks the well casing to the drill casing so that well casing is raised as drill casing is retracted), well materials will be removed and the screened well casing may be replaced prior to restarting well construction.

For groundwater monitoring wells, the filter sand will be placed in a calculated quantity sufficient to fill the annular space to a level of approximately 2 feet above the top of the well screen (the length of the filter pack will be defined in the field work plan). For extraction or pumping wells, the level of filter sand above the well screen will be based on site conditions. The depth to the top of the filter pack will be verified by measuring, using a weighted tape. Following placement, the saturated portion of the filter pack will be surged with a surge block to settle and compact the filter pack material. Additional filter material will be added as needed.

Once the depth to the top of the filter material has been verified, fine sand (transition sand) will be placed in the annular space as a transition seal between the filter material and the bentonite seal. Bentonite will be placed via free fall through the drill casing or will be tremmied, depending on depth of well, to fill the annular space to a minimum of 3 feet above the transition sand to seal the screened interval. If bentonite is to be placed below standing water, a high solids bentonite grout will be pumped through a tremie pipe, or bentonite chips may be tremmied or placed via free fall in accordance with manufacturers recommendations and provided well construction documents (bentonite pellets, placed by free fall through the auger, may be used in place of chips only if it is certain that the coating on pellets will have no impact on groundwater or aquifer chemistry). The completed bentonite transition seal will be allowed to hydrate for at least 30 minutes prior to placing the top grout, or if bentonite pellets are used, the amount of time recommended by the

manufacturer. Prior to grouting, the depth to the top of the transition seal and the total depth of the well will be measured, using a weighted tape.

For monitoring wells, the filter sand will be placed in a calculated quantity sufficient to fill the annular space to a level of approximately 2 feet above the top of the well screen (the length of the filter pack will be defined in the RI WP and SAP/QAPP). For extraction or pumping wells, the level of filter sand above the well screen will be based on site conditions. The depth to the top of the filter pack will be verified by measuring, using a weighted tape.

A neat cement grout, cement/bentonite grout, or high solids bentonite grout (if below the water level) will be placed from the top of the transition seal to the ground surface. The grout seal will be placed in hollow-stem auger/sonic borings by pumping through flexible hose or tremie pipe lowered to near the bottom of the zone being grouted. For wells constructed with PVC, cement-based grout should be placed in lifts to minimize the potential for the well casing to be damaged by heat of hydration. The grout must be tremmied if there is standing water in the augers above the transition seal.

Typical specifications of grout mixtures include the following:

- Neat cement grout composed of Class A, Type I Portland Cement mixed with not more than seven gallons of clean water per bag (one cubic foot or 94 pounds) of cement with a density of 15 to 16 pounds per gallon, or to manufacturer's specifications.
- Bentonite-cement grout composed of powdered bentonite (less than 5% by weight) and Portland cement mixed at not more than eight gallons of water to the bag, with a density of 14 to 15 pounds per gallon, or to manufacturer's specifications.
- High solids sodium bentonite grout with a minimum of 20% solids and mixed per manufacturer's specifications with water and/or other required additives.

2.5 Surface Completion

Upon completion of the well, the riser pipe will be cut cleanly so that the top of the well is level, and a mark or notch will be made on the top of the riser pipe identifying a reference point for water level measurements at the well. The well will then be fitted with a suitable slip-on cap, threaded end cap, or waterproof cap on the top of the riser casing to reduce the potential for entry of surface runoff or foreign matter. Either a steel protective well cover (e.g., stovepipe), or a vault (e.g., roadbox) with a traffic-rated cover will be completed slightly above (approximately 1 inch) the ground surface. Wells will be locked for security and designed to limit surface water infiltration. Protective well casing and vaults shall be sufficiently large for the well cap and lock, and shall be fixed in place using cement, concrete, or a similar material.

In addition to this guidance, the regulatory agencies may have specific documentation requirements for monitoring well installations. These requirements should be known and planned for in advance to ensure timely and effective compliance.

2.6 Development

The well development process involves uses or a combination of mechanical methods to (1) recover fluids introduced into the formation and sand pack during drilling, (2) remove fine-grained materials and sand bridges from the sand pack and adjacent formation, (3) remove the "skin" from the borehole wall, and (4) help repair damage to the formation from drilling.

Monitoring well development shall be performed as soon as practical after well installation, but not sooner than 48 hours following placement of the seal. State or local regulatory agencies may specify the time period, and individuals planning well development activities should be aware of such requirements relative to their specific site(s). Monitoring wells may also be redeveloped after they have not been used for a period of time, show evidence of sediment buildup in the bottom of the well, or start yielding turbid water samples.

Before developing monitoring wells, field personnel should review the well construction details/log, if available, and decontaminate any downhole equipment per SOP-11. The general process for monitoring well development is as follows:

1. Calibrate the water quality meter using the provided calibration solutions according to the instrument manufacturer's specifications (SOP-8).

2. Visually inspect the well head and note any issues (e.g., missing lock, label, or cap and any damage to the surface completion) on the field form and report to the project team.

3. Unlock the well and measure the depth to water level measurement and total depth of the well (SOP-6) and compare that value with that shown on the well completion diagram or form. If observed, record any unusual conditions such as possible obstructions or tight spots as the well tape is lowered or removed from the well. Do not insert bailer, pump, or surge block into well if obstructions or damage to the well are suspected; instead, report the condition to the project team and obtain approval to continue or cease well development activities, as appropriate.

4. Calculate the volume of water in the well (including the filter pack) using the equation included on the Well Development Log (attached).

5. If sand or sediment is present inside the well, it should be removed by bailing accumulated sediment and residual mud from the casing (using a suction bailer), and then by surging the screen below the groundwater with a rubber surge block (at 2- to 3-foot intervals and a rate of approximately 1 minute per vertical foot of screened interval). Surging will be conducted slowly to reduce disruption to the filter pack and potential damage to the screen. The suction bailer will then be reintroduced into the well to remove sediment drawn into the well casing via surging. This process may be repeated if the sediment thickness remaining in the well following surging and bailing is greater than 1% of the screen length. Note that during the initial lowering of the bailer into the well, the bailer should be lowered slowly and not

dropped to the bottom of the well. Failure to do this may cause the bailer to break or dislodge the well bottom cap or sump, which could result in the well needing to be replaced.

6. Periodically measure the depth to water and check to see that the well recovers sufficiently during and after sediment removal.

7. Development will proceed by purging the groundwater (at a high achievable/sustainable flow rate) with an electric submersible pump (or with a suction bailer, if groundwater recovery into the well is slow) lowered into the well casing to a depth near the well bottom.

8. While development progresses, take periodic water level measurements to determine if drawdown is occurring and record the measurements of the appropriate forms.

9. While development progresses, measure the water discharge and calculate the rate at which water is being removed from the well. Record the volume, time and rate on the Well Development Log form (attached).

10. While development progresses, periodically collect water directly from the pump discharge and measure for specified parameters. Field measurements of water quality parameters in accordance with SOP-8 should be regularly collected during development using a calibrated water quality meter. During pumping, groundwater depth, pumping rate, and the cumulative volume of groundwater purged during well development activities should also be monitored. Water shall not be added to the well to aid in development except when clay-dispersing agents and/or hydraulic jetting is required (see Sections 3.3.1 and 3.3.2).

11. Continue well development until a predetermined set of conditions are met. The exact conditions and criteria should be specified in the project work plans. These can include the following:

    - The total volume of water removed from the well equals five times the standing water volume in the well (including the well screen and casing plus saturated annulus, assuming 30% porosity) plus the volume of drilling fluid lost.
    - Water quality parameters stabilize in accordance with SOP-8, and turbidity reading remains at less than 5 NTUs, to the extent achievable or turbidity +/- 10% when turbidity is greater than 10 NTUs
    - The sediment thickness remaining in the well is less than 1% of the screen length.

12. Once development is completed, obtain a final water level and turbidity measurement and record on the Well Development Log (attached).

13. Remove equipment from the well.

14. Manage purge water in accordance with SOP-13.

15. Decontaminated non-dedicated equipment in accordance with SOP-11.

The well screen should be considered to have been adequately developed when the criteria outlined above are satisfied. Modifications to these criteria can be made with approval of the project team. Any deviations should be based on professional judgement discussed with the project team and project manager prior to implementation. Document deviations in the field notes.

2.7 Additional Development Techniques

Should the recharge to the well be so slow that the required volume cannot be removed in 4 to 6 consecutive hours or if the water remains discolored, the project team shall terminate purging and/or discuss other options for improving water quality. The project manager may employ more aggressive well development techniques to improve well capacity and/or to assist in removing fine-grained materials from the well. These more rigorous techniques could include introducing clay-dispersing agents and hydraulic jetting.

2.8 Documentation

Field documentation includes completed boring logs, calibration records, and other field notes deemed relevant. It is essential that field forms be filled out completely and legibly at each location, and that entries are consistent for each location and among different personnel. Field documentation should be completed in accordance with SOP-1.

2.9 Decontamination of Boring Equipment

Drilling equipment should be decontaminated in accordance with SOP-11.

2.10 Investigation-Derived Waste Management

Soil cuttings are to be contained on-site in an appropriate, labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as PPE, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain on-site. Refer to SOP-13.

Attachment 1. Well Development Log

Geosyntec consultants	PROJECT NAME		WELL NO.	DATE INSTALLED
WELL DEVELOPMENT LOG	PROJECT NO.	SITE	PREPARED BY	

METHOD

PUMP ___
BAILER ___
OTHER ___

Water Level/Depth to Bottom (TOC)

Before Development:

After Development:

Remarks/Estimated Recharge Rate:

Fluid Loss During Drilling (if applicable)

WELL CONSTRUCTION DATA (ft)

WELL CASING:

TOP OF CASING HEIGHT/DEPTH (TOC) = _

INSIDE DIAM d_wID = _____

OUTSIDE DIAM d_wOD = _____

HOLE DIAMETER d_h = _____

DEPTH TO:

SCREENED INTERVAL _____ TO _____

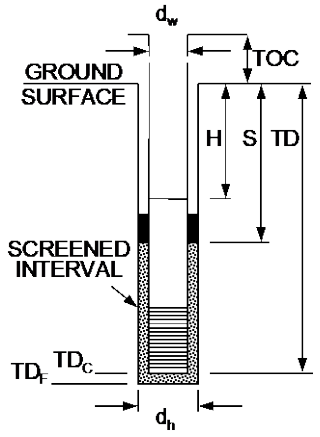
WATER LEVEL H = _____

BASE OF SEAL S = _____

BASE OF CASING TD_C = _____

BASE OF FILTER PACK TD_F = _____

ESTIMATED FILTER PACK POROSITY P = 0.30



WELL VOLUME CALCULATION

CASING VOLUME =

$$V_c = \pi\left(\frac{d_w ID}{2}\right)^2 (TD_C - H) = 3.14\left(\frac{\quad}{2}\right)^2 (\quad - \quad) = \quad ft^3$$

FILTER PACK PORE VOLUME =

$$V_f = \pi\left[\left(\frac{d_h}{2}\right)^2 - \left(\frac{d_w OD}{2}\right)^2\right](TD_F - (S \text{ or } H))(P)$$

$$= 3.14\left[\left(\frac{\quad}{2}\right)^2 - \left(\frac{\quad}{2}\right)^2\right](\quad - \quad)(\quad) = \quad ft^3$$

(if S > H, use S. If S < H, use H)

TOTAL WELL VOLUME =

$$v_T = v_c + v_f = \quad + \quad = \quad ft^3 \times 7.48 = \quad GAL$$

DEVELOPMENT LOG						TOTAL	WATER QUALITY					COMMENTS
DATE	TIME (start)	TIME (stop)	FLOW RATE (gpm)	DEPTH TO WATER (ft-btoc)	WATER REMOVED (gal)	WATER REMOVED (gal)	pH	SPECIFIC CONDUCTIVITY (mS/cm)	TURBIDITY (NTU)	TEMPERATURE (Degrees C)	ORP (mV)	

SOP NO. 6

Measuring Groundwater Levels

SOP No. 6
Measuring Groundwater Levels

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) describes the field procedure typically followed by field personnel when measuring groundwater levels. Groundwater levels in wells should be measured prior to commencing developing, purging, sampling, and pumping tests.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of water level measurements is to gain accurate measurements (to within 0.01 feet) of the depth of groundwater for use during well installation, in the recording of data for the preparation of groundwater elevation contour maps, purge volume calculations during groundwater sampling, slug tests, packer tests, and pump tests. The water levels also used to measure the water/oil interface to confirm NAPL presence and estimate the quantity of NAPL present.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms

- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Sample containers as specified in the SAP/QAPP
- Electronic water level indicator or oil/water interface meter (graduated)
- Well keys
- Previous measurement data (if available)
- Decontamination supplies (e.g., buckets, Alconox, distilled water, squirt bottle)
- Groundwater purge-and-sample form(s) if in conjunction with groundwater sampling
- Tools to open well covers (e.g., socket wrench, spanner wrench)
- Disposable gloves (as a minimum), and other protective clothing (as necessary)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

Wells should be inspected and water levels measured prior to development and sampling. Following the procedures below to conduct water level measuring.

1. If more than one well is to be measured, begin depth measurement in the order of lowest to highest chemical concentrations in the monitoring wells.

2. Remove well caps from all wells to be measured prior to initiation of water level measurement activities. This will allow wells to equilibrate, if necessary

3. Monitoring well inspection will include opening the monitoring well monument and well, a visual inspection of the well casing (where possible). Record the condition of the well (protective casing, concrete collar, lock in place, etc.) and measure the inner well diameter.

4. Check that the water level tape has no obvious kinks or damage.

5. Put on nitrile gloves. Stand upwind of the well, then unlock and open the well. If a non-vented well cap is present, remove the cap and monitor the well mouth immediately. Record any pertinent air monitoring results (sustained, dissipating, background, odor).

6. Identify the previous measuring point marking or notch on the riser or casing (if present). Record this location in the field logbook or on the applicable field form (e.g., water level monitoring form).

7. Using a decontaminated water level indictor (or oil/water interface meter), turn on the meter, check the audible indicator, reel the electronic probe into the well riser (with the increments visible) slowly until the meter sounds, grasp the tape with hand, withdraw the tape, and lower it again slowly until the sound is again audible. Check the depth to water on the tape and make a mental note of the depth to within 0.01 feet. Raise and then lower the probe again slowly and repeat the measurement for accuracy. A 1-foot error is the most common measurement type during water level measurements. Be sure to read the depth on the tape correctly. Repeat measurements a minimum of three times or have field partner confirm measurement.

8. Record the depth to water from the measuring point in the field notebook or on the applicable field form (e.g., water level monitoring form).

9. If NAPL[6] is present, use of the oil/water interface meter according adhere to the manufacturers' specifications. Advance the probe slowly until the audible indicator sound changes. Check the depth to water on the tape and make a mental note of the depth to within 0.01 feet. Raise and then lower the probe again slowly and repeat the measurement for accuracy. A 1-foot error is the most common measurement type during water level measurements. Be sure to read the depth on the tape correctly. Record the depth to NAPL and/or thickness from the measuring point in the field notebook or on the applicable field form.

10. Record the total depth of the well, by lowering the probe until the bottom of the well is felt. Record the total depth from the measuring point in the field notebook or on the applicable field form. Repeat measurements a minimum of three times or have field partner confirm measurement.

11. Repeat as necessary.

12. Decontaminate the probe, meter, and any soiled tape. Refer to SOP-11 for decontamination.

[6] Site-specific conditions may warrant the use of stringent air monitoring and potentially more significant decontamination scenarios.

SOP NO. 7
Groundwater Sampling

SOP No. 7
Groundwater Sampling

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) was prepared to provide instructions to field personnel for groundwater sampling from monitoring or production wells using low stress (low flow) groundwater purging and sampling protocol, or non-purge/passive sampling methods. Groundwater sampling from temporary boreholes (e.g., grab groundwater samples collected from direct push borings) is not addressed by this SOP.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

Low-Flow Sampling

The objective of low flow sampling techniques is to collect a representative groundwater sample from a monitoring well by minimizing stress on the geological formation and minimizing disturbance of sediment that has accumulated in the well. This is accomplished by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well casing.

The three primary benefits of sampling at a prescribed low flow rate are: (1) it minimizes disturbance of sediment in the bottom of the well reducing turbidity and lowering the concentration of suspended particles in the sample; (2) it minimizes aeration of the groundwater during sample collection, which improves the sample quality for analysis of volatile compounds; and (3) it

reduces the volume of groundwater purged from a well and the costs associated with its treatment and disposal.

Non-Purge/Passive Sampling using a Passive Diffusion Bag

Passive diffusion bags (PDBs) are thin polyethylene bags filled with deionized water that are suitable for sampling certain chemicals in groundwater[7]. The PDBs are hung in a groundwater monitoring well below the water table for no less than 2 weeks (14 days). Chemicals compounds may diffuse through the bag, until eventually the concentration of compounds inside the bag are in equilibrium with the concentrations in groundwater outside of the PDB[8]. The PDBs are removed after the equilibration periods and the water inside the bag is sampled and tested. PDBs are a means for measuring the time-averaged concentration of some compounds in groundwater during the equilibration period.

These procedures are appropriate for collecting groundwater samples that should be analyzed for chemicals of potential concern (COPCs) as identified in the RI WP.

1.3 Field Equipment and Supplies

Pump and probe selection may differ depending on the well diameter, groundwater constituents, and depth to groundwater, but sampling will generally require the following equipment:

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Sample containers as specified in the SAP/QAPP
- Well lock keys.

[7] Note: The use of PDBs may not be suitable for the assessment of Tertiary Amyl Methyl Ether, methyl tert-butyl ether, methyl-isobutyl ketone, styrene, and acetone. The effectiveness of the use of a single PDB sampler in a well is dependent on the assumption that there is horizontal flow through the well screen and that the quality of the water in the well screen is representative of the groundwater in the aquifer directly adjacent to the screen. If there are vertical components of intrabore-hole flow, multiple intervals of the formation contributing to flow, or varying concentrations of VOCs vertically within the screened or open interval, then a multiple deployment of PDB samplers within a well may be more appropriate for sampling the well.

[8] Typically, PDB samplers should not be used in wells having screened or open intervals longer than10 feet. If PDB samplers are to be used in wells with screened intervals of greater than 10 feet, then they are generally used in conjunction with borehole flow meters or other techniques to characterize vertical variability in hydraulic conductivity and contaminant distribution or used strictly for qualitative reconnaissance purposes. In larger well screens or in wells that may have vertical flow, the use of baffles should be considered.

- Adjustable rate, positive displacement groundwater sampling pumps (e.g., centrifugal, submersible, or bladder pumps constructed of stainless steel) capable of a flow rate between 50 and 500 milliliters per minute (mL/min) and appropriate power supply (e.g., generator). The pump type/size will primarily depend on the depth to water and well diameter.
- Water and/or multiphase interface monitoring probe (i.e., non-aqueous phase liquid level measuring device) with a minimum 0.01-foot accuracy.
- Flexible discharge tubing [polyethylene (PE), Teflon, or similar], connections, and tools as appropriate, and sufficient tubing to dedicate to each well.
- Purge water collection container (e.g., one or more 5-gallon buckets) and funnel.
- Nitrocellulose filters (if conducting field filtering).
- Flow measurement supplies: graduated cylinder or 1-liter bottle and watch/stopwatch.
- Multi-parameter water quality meters, flow-through cell, and calibration solutions (see SOP-8).
- Photoionization detector (PID).
- PDBs supplied by a distributor or laboratory, pre-filled with deionized water.
- Sample documentation: chain-of-custody, sample labels
- Coolers and sufficient ice to keep samples at a maximum temperature of 4 degrees Celsius (°C).
- Clean plastic sheeting, paper towels, and miscellaneous housekeeping supplies.
- Previous purging and sampling data, including water levels, purging parameters, and laboratory analysis results.
- Monitoring well boring and construction log (including wellhead elevation survey and reference point information).
- Shipping and handling supplies (SOP-10)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-14)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder.
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.).

SECTION 2 PROCEDURES

2.1 Pre-Mobilization Activities

- Obtain the construction, diameter, depth, material, screened interval, and map showing location for each monitoring well to be sampled.
- Obtain a listing of the parameters that should be measured in the field or laboratory as part of this sampling program, including the required analytical method, sample volume, and holding time for each parameter. The low-flow stabilization parameters that should be measured in the field include temperature, pH, specific conductance, ORP, DO, and turbidity. These parameters should be recorded during purging and immediately prior to collection of samples for laboratory analysis.
- Verify that equipment is properly functioning, and sufficient coolers and laboratory supplied sample containers are assembled prior to mobilization.

2.2 Initial Field Procedures

Several initial tasks are required before purging or sampling any wells. These activities ensure that instruments are functioning and properly calibrated, and that the necessary equipment has been supplied for efficient and accurate sampling.

2.2.1 Inventory

Verify that the correct equipment has been received by field personnel and that it is clean (decontaminated). Inventory sample containers to verify that the laboratory has provided the correct number of containers of the proper size and containing the correct preservative, if required. To the extent possible, pre-label/tag and bundle sample containers for each well to avoid confusion or mixing containers during sample collection.

Verify that the appropriate PPE and miscellaneous supplies (e.g., paper towels, decontamination solution) have been received by the field sampling crew. The appropriate protective equipment, as specified in the HASP, should be reviewed during a morning tailgate meeting. Contact the Field Lead or Project Manager immediately if there are any discrepancies.

2.2.2 Calibration

Calibrate the field instruments at the start of each field day (prior to sampling) or at more frequent intervals as specified by the manufacturer. Record the calibration data and time on the field calibration record. Verification of the calibration shall be performed at the end of each field day for equipment used. Instruments should be recalibrated as necessary (e.g., when calibration verification indicates incorrect operation) to ensure accurate measurements, and checks and recalibrations should be recorded on field calibration forms. Calibration will also be checked if any readings during sampling are suspect.

2.2.3 Well Inspection

Inspect the well for the presence of lock and cap, surface seal integrity, obstructions, evidence of tampering, debris, or surface water collecting in the well casing. Note any irregularities in the field logbook and on the monitoring forms.

2.3 Well Purging and Sampling

Well purging and sampling is performed using the step-by-step procedures listed below and should be followed upon arrival at each well. Wells are purged using a low flow/minimum drawdown protocol. Well purging and sampling activities should be performed according to the SAP/QAPP.

2.3.1 Pre-Purging Activities

1. Start at the well known or believed to have the least contaminated groundwater and proceed systematically to the well with the most contaminated groundwater.

2. Lay out a sheet of polyethylene for monitoring and sampling equipment.

3. Remove well cap.

4. If the well casing does not have a reference point (usually a V-cut or indelible mark in the well casing), make one on the northern side of the casing. This will be the measuring point reference.

5. Measure and record the depth to water (to 0.01 foot) in wells to be sampled before any purging begins. Care should be taken to minimize disturbance in the water column and dislodging of any particulate matter attached to the sides or settled at the bottom of the well.

6. If required, measure and record the depth of any non-aqueous phase liquids (NAPLs) using an interface probe. Care should be taken to minimize disturbance of any sediment that has accumulated at the bottom of the well. Record the observations in the field logbook.

2.3.2 Purging and Sampling Activities

7. Install the pump: Slowly lower the pump[9], safety cable, tubing, and electrical lines into the well to a depth midway within the screen interval for that well for fully submerged screens or midway within the submerged portion of the screen for partially submerged screens. The

[9] Use one of the following devices for purging or sampling (pumps or pump intakes should be placed at a depth approximate to the middle or just slightly below the middle of the well screen or water column unless another position is justified based on site-specific conditions): (1) bladder pump, (2) peristaltic pump (if degassing of water is occurring when sampling with a peristaltic pump, alternative types of sampling equipment should be used for volatile organic compound sample collection), (3) inertial pump (some studies suggest that the use of inertial pumps for purging and/or sampling may produce a low bias when collecting samples for VOC analyses. This should be considered along with regulatory requirements when selecting an inertial pump for purging and/or sampling), or (4) submersible pump.

pump intake must be kept at least 2 feet above the bottom of the well to prevent disturbance and resuspension of any sediment or NAPL present in the bottom of the well. Record the depth to which the pump is lowered.

8. Measure the water level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

9. Calculate the volume of water in the well casing: The volume of water in the well casing should be calculated if wetted-casing-volume-based purging is to be used to remove the so-called "stagnant water" from the well prior to sampling. The volume of water in the wetted well casing should be calculated using the formula $V = (\pi r^2) \times L$ where r is one-half of the inner diameter of the well casing/screen and L is the length of wetted casing/screen (calculated by subtracting the depth to water from the total well depth). Total well depth should not be measured at the start of a sampling event (due to the potential to cause turbidity). Measure the total well depth after sample collection. Note that some regulatory agencies require that the calculated "stagnant water" volume include the water contained in the pores space of the wetted portion of the monitoring well filter pack in addition to the casing/screen. If this is a requirement, it should be defined in the project-specific sampling requirements.

10. Purge the well: Start pumping the well with a rate that varies from 200 to 500 milliliters per minute. The water level should be monitored approximately every 3 to 5 minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 feet or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. Care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment. If drawdown of 0.3 feet or less is not feasible, refer to the guidance provided below under "Special Circumstances."

11. Monitor water quality indicator parameters: While purging the well, monitor and record the field parameters (turbidity, temperature, specific conductance, pH, ORP, and DO) approximately every 3 to 5 minutes. *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (USEPA 2001) states that "with respect to groundwater chemistry, an adequate purge is achieved when pH, specific conductance, and temperature of groundwater have stabilized, and the turbidity has either stabilized or is below 10 Nephelometric Turbidity Units (NTUs)" The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:

    - ±0.1 units for pH
    - ±3% for specific conductance
    - ±10 mV for ORP

- ±10% for temperature
- ±10% for turbidity or under 10 NTU
- ±10% for DO or under 0.5 mg/L

DO and turbidity measurements usually require the longest time to achieve stabilization. If turbidity is greater than 50 NTU, redevelopment of the well may be warranted. If well readings fail to stabilize after 4 hours of continuous purging, refer to the guidance provided below under "Special Circumstances."

The pump must not be removed from the well between purging and sampling.

12. Collect samples: Collect samples at flow rates of between 100 and 250 mL/min or such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 feet. Samples should be collected at the same flow rate at which the indicator parameters stabilized.

    a. Sample collection considerations. When multiple analyses shall be performed, collect the samples in order of decreasing sensitivity to volatilization (i.e., VOCs to metals). VOC samples must be collected first, at the lower rate, directly into pre-preserved sample containers. When sampling for VOCs, sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container. When filled and capped, turn the sample container upside down to identify possible headspace. If bubbles are present, top off the sample bottle or resample (do not reuse bottles, especially if they have been pre-preserved by the vendor or laboratory). If possible, the pump should not be moved or turned off between purging and sampling. The ground surface should be protected from incidental splashing, especially if water from the well would be considered a hazardous waste for disposal purposes

    b. Field filtering groundwater samples. Groundwater sample filtering and/or preservation should be performed in accordance with the requirements of the analytical method being specified and any other project-specific requirements. For example, samples collected for dissolved metals are typically filtered using a 0.45 micrometer (µm) filter.

13. Remove pump and tubing: After collecting the samples, the tubing (unless permanently installed) must be properly containerized as investigation-derived waste (IDW) per SOP-13, or dedicated to the well for resampling by hanging the tubing inside the well.

14. Measure and record well depth.

15. Close and lock the well.

2.3.3 Special Circumstances

For wells with insufficient yield/low recharge rate

Care should be taken during purging and sampling activities to avoid loss of pressure in the tubing line, cascading through the sand pack, or pumping the well dry. Purging should be interrupted before the water level in the well drops below the top of the pump. Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples.

For wells with parameters that fail to stabilize

If a key indicator parameter fails to stabilize after 4 hours of continuous purging, one of two options should be considered: (a) continue purging in an attempt to achieve stabilization; or (b) discontinue purging, collect samples, and document attempts to reach stabilization in the field logbook. The key indicator parameter for samples to be analyzed for VOCs is dissolved oxygen. The key indicator parameter for other samples is turbidity.

Light non-aqueous phase liquid (LNAPL) present in a monitoring well.

Wells containing LNAPL are typically not sampled for dissolved phase constituents in groundwater due to the potential for entrainment of LNAPL in the aqueous sample matrix. If such sampling is required, and purging is not required, make sure the pump intake is placed in the upper 2 feet of the water column and collect the samples without purging in a manner that reduces the potential for mixing of the groundwater sample with air or LNAPL. If groundwater sampling is required from wells containing LNAPL for the purposes of characterizing VOCs, and purging is required, purge the well prior to sampling unless, or until, LNAPL becomes entrained in the sampling apparatus. If LNAPL will likely become entrained in the groundwater, the sample should be collected without purging. If LNAPL becomes entrained in the sampling apparatus, then the sampling effort for VOCs should be aborted.

2.3.4 Observations

Field personnel will identify and log any observations that may be considered unusual on the monitoring form for each well. Separate notes may also be taken in the field logbook. These observations include but are not limited to excessive bubbling within the tubing or in the sample containers as they are filled; odors; excessive turbidity, solids, or formation of precipitates in the samples; color changes in the water; and unusual sounds made by the equipment. In addition, sampling personnel will note the condition of the well upon arrival and inspection. If the well casing is damaged, then the casing damage may indicate compromised sample quality.

2.3.5 Sample Storage and Shipping

Samples should be stored, packed, and shipped in accordance with SOP-10.

2.4 Sampling using a Passive Diffusion Bag

2.4.1 Passive Diffusion Bag Sampler Preparation

A passive diffusion bag (PDB) is approximately 2 feet long, 1.5 inches in diameter, and contains about 220 milliliters (ml) of deionized water. The manufacturer will prepare a batch of PDBs and confirm the absence of analytes prior to shipping. Once prepared PDBs have been received from the supplier or laboratory, the following procedures should be followed:

- PDBs should be inspected to verify they are dry, stored in a barrier pouch, and wrapped in clean polyethylene sheeting inside a cooler containing wet ice to preserve the integrity of the deionized water-filled polyethylene bags and minimize the formation of headspace inside the polyethylene bag. PDBs not received in this condition should not be used.
- Field personnel should review well construction details and water levels in each well to be sampled prior to mobilizing. Well-specific PDB tethers should be fabricated before mobilizing to the site. These can also be prepared by the vendor or laboratory if the well and screen dimensions are provided. Snap hooks should be attached to the line at depths where PDBs should be positioned (i.e., sampling depths), which is typically the midpoint of the screened interval. A stainless steel weight should also be secured at the end of the line so that the weight hangs slightly above the bottom of the well when the PDB holder is installed in the well. To minimize the potential for contamination, place each well-specific PDB holder in a labeled zip-top bag once transported to the site. The tethers should be dedicated to a well and may be left in place until their next use.

2.4.2 Passive Diffusion Bag Sampler Installation

PDBs are installed using the following procedures:

- Measure the water level in accordance with SOP-6.
- Measure the depth to the bottom of the well (or top of sediment within the well) to confirm that the correct depth at which the sampler will be suspended. If any differences are noted between measured depths and depths from well construction details, they should be noted on the field data sheets.
- Don clean gloves and remove a PDB from is barrier pouch.
- Inspect the PDB for the presence of air bubbles and leaks. PDBs having either bubbles or leaks shall not be used.
- Attach the PDB to the (well-specific) tether using the stainless steel snap hooks.
- Slowly lower the PDB down the well until the stainless steel weight is slightly above the bottom of the well, indicating that the sampler is properly positioned in the target screened interval.

- Secure the line to the casing of the well or, for a flush mounted well, the locking cap.
- Close and lock the well.
- Record the date, time, and well name in the field records.

2.4.3 Passive Diffusion Bag Sample Collection

Following a 14-day (minimum) sampling/equilibration period, PDBs are retrieved as follows:

- Open the well, then don clean gloves and remove the sample-filled PDB from the well using the attached tether.
- Remove the PDB from the stainless steel snap hooks, and dry and clean the PDB with a clean paper towel.
- Penetrate the PDB with the vendor- or laboratory-supplied straw and drain water from the PDB directly into the sample containers. Sample containers for analysis of volatile organic compounds (VOCs) should be pre-preserved and filled with minimal turbulence and with no headspace remaining in the container. The groundwater samples should be labeled and placed in a sample cooler immediately following collection and stored on ice in accordance with the SOP-10.
- Install a new PDB and return the line to the well for another sampling period, or wrap and store the line in a dedicated bag until the next sampling event.
- Close and lock the well after sampling activities are complete.

2.4.4 Sampling Equipment Decontamination

Prior to assembling the PDB sampler, decontaminate the stainless steel parts in accordance with SOP-11. After decontamination, dry the stainless steel parts with clean paper towels and place in a plastic bag, sealing the bag to ensure that no outside contaminants are introduced before the next sampling.

2.5 Documentation

Field documentation includes completed monitoring forms, calibration records, and other field notes deemed relevant. It is essential that field forms be filled out completely and legibly at each location, and that entries are consistent for each location and among different personnel. Field documentation should be completed in accordance with SOP-1.

2.6 Decontamination of Groundwater Sampling Equipment

Groundwater sampling equipment should be decontaminated in accordance with SOP-11.

2.7 Investigation-Derived Waste Management

Purge water is to be contained on-site in an appropriate, labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as

personal protective equipment, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain onsite. Refer to SOP-13.

SECTION 3 QUALITY CONTROL GUIDANCE

Follow the quality control requirements specified in the SAP/QAPP, RI WP, and/or project-specific regulatory requirements, as applicable. These may include collecting additional samples for field duplicates, equipment-rinsate blanks, field blanks, or matrix spike/matrix spike duplicates. Samples may also need to be shipped with trip and/or temperature blanks.

SOP NO. 8

Measurement of Water Quality Parameters: Specific Conductance, Temperature, pH, Dissolved Oxygen, Oxidation Reduction Potential, and Turbidity

SOP No. 8
Measurement of Water Quality Parameters: Specific Conductance, Temperature, pH, Dissolved Oxygen, Oxidation Reduction Potential, and Turbidity

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) describes the procedures that will typically be followed by field personnel during field measurement of water quality parameters such as specific conductance, temperature, pH. dissolved oxygen (DO), oxidation reduction (redox) potential (eH), and turbidity.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of collecting water quality parameter measurements is to provide evidence that a representative groundwater sample is being collected from a monitoring well, and to record the characteristics of the groundwater.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms

- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)
- Other task-specific equipment and supplies identified below.

SECTION 2 SPECIFIC CONDUCTANCE AND TEMPERATURE

2.1 Field Equipment and Supplies

- Yellow Springs Instruments (YSI) conductivity meter
- Standard conductivity solutions (1,000; 10,000 and 100,000 microsiemens per centimeter [µmho/cm])
- Deionized water in squirt bottle
- Pint plastic jar
- Small brush

2.1.1 Calibration of Conductivity Meter

The probe correction factor should be determined at the beginning and end of each sampling day as follows:

1. Check red line and zero point on meter and adjust if necessary.
2. Rinse probe with deionized water.
3. Calculate probe correction factor for each standard and average the two values. The probe correction factor is the ratio of the computed conductivity to the measured conductivity of the standard solution.

2.1.2 Monthly Calibration Procedure

1. Measure and graph the conductivity meter probe response to known standards throughout the range of response.
2. If a linear response is observed, two calibration standards can be used in the field.

3. If a nonlinear response is observed, more than two field calibration standards will be necessary in the field.

2.1.3 Field Equipment Maintenance

1. Store meter in case during transport. Immerse probe in deionized water for storage.

2. Check batteries before taking meter into the field. Carry spare batteries and deionized water for rinsing probe.

3. If meter readings are erratic, use a bottle brush and mild acid to clean holes in the probe; otherwise, return meter and probe to factory for repair.

2.2 Procedures for Measuring Specific Conductance and Temperature

Field personnel will adhere to the following procedures while conducting field temperature and specific conductance measurements:

1. Check red line and zero point on meter. Adjust meter needle to read zero in the off position using adjustment screw below the needle. Adjust meter to the red line position using the red-line knob. Replace batteries if meter will not adjust to the red line.

2. Rinse sample cup (500 milliliter [mL] plastic) beaker with sample water three times.

3. Fill sample cup with water sample.

4. Rinse conductivity probe with deionized water then with sample water and place probe in sample cup.

5. Submerge conductivity probe in sample so that flow cell holes are immersed. Pump probe up and down a few times to dislodge bubbles. Do not submerge to bottom, for this causes false high readings. Turn instrument on to highest scale multiplier and downscale to appropriate scale for sample reading. Multiply reading on scale by the correct multiplier from the dial and record to the nearest half-increment between marks. Turn function knob to the Temp position. Read sample temperature to the nearest 0.5 degrees °C after temperature has equilibrated (about 1 minute).

6. Remove probe from sample and rinse with deionized water (soak).

7. Report conductivity and temperature so temperature correction can be applied if necessary.

SECTION 3 PH MEASUREMENTS

3.1 Field Equipment and Supplies

- Portable pH meter with potassium chloride (KCl) probe and temperature probe

- Extra KCl filling solution
- 50 mL plastic jar or other suitable container
- Squirt bottle and supply of deionized water
- pH 7, 10, and 4 buffer solutions.

3.1.1 General Procedure for Instrument Calibration

1. Calibrate pH meter in the field at the beginning of each day of fieldwork and when the standard check is out of calibration.

2. Rinse pH and temperature probes in deionized water.

3. Turn on meter and immerse pH and temperature probe in a pH 7 buffer solution. Calibrate meter to pH 7, allowing enough time for meter to stabilize.

4. Rinse pH and temperature probe with deionized water.

5. Immerse pH and temperature probe in either a pH 4 or a pH 10 buffer solution, depending on whether expected pH of samples is above or below pH 7. If expected sample pH is above pH 7, use pH 10 solution for the second calibration. If expected sample pH is below pH 7, use pH 4 for the second calibration. Calibrate meter to second pH solution, allowing enough time for meter to stabilize.

6. Rinse pH and temperature probe with deionized water.

7. Perform occasional rechecking of meter calibration to pH 7 calibration solution during usage. Repeat the calibration process (Steps 2-4) if value for final pH check is more than 0.1 unit from pH 7.

3.1.2 Field Equipment Maintenance

1. Store meter in case with pH electrode immersed in a pH 7 buffer solution.

2. Inspect pH and temperature probes for cracks and scratches.

3. Inspect pH probe for containing adequate amount of KCl solution. If amount is low, refill as needed.

4. Carry spare batteries and screwdriver in the meter case.

5. Carry a copy of the instruction manual with meter.

3.2 Procedures for Measuring pH

1. Calibrate meter according to manufacturer's instructions. Prior to first measurement, check calibration against pH 7 buffer and again periodically over the course of the day, and recalibrate if the reading is more than 0.1 units from pH 7.

2. Use 50-mL plastic jars or other suitable containers for measurement readings. Rinse sample test container with sample water three times prior to measurement.

3. Immerse pH probe and temperature electrode in sample water. Gently stir sample for thorough mixing. Read and record pH to nearest 0.1 unit once pH reading has stabilized. Many pH meters possess an automatic feature which indicates final stabilized measurement.

4. Rinse or bathe pH and temperature probes with deionized water or soak in deionized water between measurements. Changing deionized water bath between measurement stations increases accuracy of measurements.

SECTION 4 DISSOLVED OXYGEN (DO)

4.1 Field Equipment and Supplies

- YSI DO meter
- Spare membranes
- Electrolyte solution
- Deionized water
- Sodium sulfite solution (zero oxygen [O_2] solution)
- DO bottle

4.2 Procedures for Measuring Dissolved Oxygen

1. Inspect DO meter for damage. Inspect probe for sufficient electrolyte and to determine if oxygen sensor membrane is in good condition. Field Services will replace the membrane if torn or wrinkled. Inspect for air bubbles beneath the membrane. If bubbles are present, remove membrane and add electrolyte solution. Replace membrane so no air bubbles are entrapped.

2. Rinse probe with deionized water.

3. Calibrate probe and meter according to manufacturer's instruction.

4. Take a grab sample, using a DO bottle so it is filled without headspace, then flush water by inserting the tube into bottle or fill bottle while submerged. Insert probe into bottle, allow time for stabilization.

5. Read and record DO concentration.

SECTION 5 REDOX POTENTIAL

5.1 Field Equipment and Supplies

- Portable pH meter capable of output in millivolts (mV)
- eH and KCl reference probe
- Quinhydrone
- pH 4, 7, and 10 buffers
- 125-mL plastic jars
- Deionized water

5.2 Procedures for Measuring Redox Potential

1. Calibrate instrument in accordance with manufacturer's recommendations immediately prior to making measurements.
2. Rinse decontaminated glass beaker with approximately 50 mL of sample water three times.
3. Rinse eH electrode with deionized water.
4. Fill beaker with sample water, minimizing aeration.
5. Turn on meter. Immerse electrode in sample and allow several minutes for the probe to equilibrate with the water. Obtain reading to nearest 10 mV. Use a consistent amount of time for reading to stabilize.
6. Record reading on standardized field forms or in the field logbook. Note any problems (e.g., erratic readings).
7. Rinse probe with deionized water and store according to manufacturer's directions.

SECTION 6 TURBIDITY

6.1 Field Equipment and Supplies

- Turbidimeter (Hach 2100 or similar) and calibration standards (if necessary)
- 0 NTU, Suspended Polymer Turbidity Standard
- 50 NTU, Suspended Polymer Turbidity Standard
- Distilled Water
- Spare batteries

- Personal protective equipment (PPE) per HASP

6.2 Procedures for Measuring Turbidity

1. Place the Hach 2100 turbidimeter on a stationary, level surface. Do not hold the instrument while making measurements.

2. Turn on the turbidimeter.

3. Rinse a sample cell three times with the sample deionized water and discard.

4. Fill the rinsed sample cell with approximately 15 mL of sample water. Take care to handle the sample cell by the top and cap the cell.

5. Wipe the cell with a soft, lint-free cloth to remove water spots and fingerprints.

6. Place a bead of silicone oil on the sample cell below the white arrow/orientation mark and wipe gently with the oiling cloth to spread the oil thinly and uniformly. Take care not to touch the glass portion of the sample cell.

7. Invert and insert the sample cell in the instrument cell compartment so the white arrow/orientation mark on the sample cell aligns with the black arrow/orientation mark in front of the cell compartment. Close the cell compartment lid.

8. Push the Read button. The display shows “Stabilizing” and then shows the turbidity reading in NTU.

9. Record turbidity reading in the field logbook or field form.

10. Rinse sample cell with distilled water, dry outside with soft cloth, and store in the turbidimeter carrying case out of direct sunlight.

SOP NO. 9

Collecting Field Duplicates

SOP No. 9
Collecting Field Duplicates

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) presents instructions for field personnel on the collection of field replicate samples ("duplicates") for soil and groundwater. Duplicates should be considered "blind" which is a second sample collected at the same time and location, under the same conditions and submitted in separate containers.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of replicate/duplicate sampling is to assess variability in sampling. Duplicate analysis is a measure of precision for sources of variability in the field and the laboratory.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Sample containers as specified in the SAP/QAPP

- Sample documentation: chain-of-custody, sample labels
- Shipping and handling supplies (SOP-10)
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

Field duplicates and replicates for soil and groundwater should be collected as described in the following sections.

2.1 Collecting Duplicates and Replicates for Soil

Field duplicates/replicates for soil consist of collocated or split samples. Collocated samples will be collected from adjacent locations (e.g., adjacent depth intervals on a core, or similar depth of an adjacent secondary core). Spilt samples will be collected from a single homogenized mix of soil. Field personnel should document in field logbooks and field forms the method in which the soil duplicate, or replicate, is collected and provide explanation on how the duplicates are representative of each other. Soil collected from either collocated or split samples should be placed directly into laboratory supplied containers in accordance with SOP-4, and the following considerations.

- For volatile organic compounds that require a discrete, undisturbed sample be collected for analysis (generally, a 5 gram soil sample), collocated sample should be collected from the soil core or hand augured soil. First, fill one of the primary sample containers, followed by one of the sample containers for the duplicate (and triplicate), then fill the second primary sample container, followed by the second sample container for the duplicate (and triplicate). Repeat filling one container at a time until all sample containers for that analyte are filled.
- For other analytes that can be obtained from a shared sample container (e.g., 8-ounce glass jar), mix/homogenize the soil from a targeted depth interval in a stainless steel bowl using a stainless steel spoon. Remove large rocks or debris that could limit the amount of soil collected in the jar for analysis. Once the sample is thoroughly mixed, place soil in the primary and duplicate sample containers as needed for the analysis.
- Label duplicate samples according to the SAP/QAPP.
- Document the primary and duplicate sample identifications in field notes.

2.2 Collecting Duplicates and Replicates for Groundwater

Field duplicates for groundwater do not need to be mixed/homogenized before analysis and should be collected directly into separate containers according to the analytical method. Field personnel should collect groundwater samples in accordance with SOP-7, with the following considerations.

- Groundwater samples and their duplicates (or triplicates for MS/MSD) should be filled according to one of the two options below, until all containers for the samples are filled.
  - For analytes that require a single container per sample (e.g., metals), fill the primary sample container, followed by the duplicate (and triplicate) sample container, before filling containers for the next analytical method.
  - For analytes that require multiple containers per sample (e.g., volatile organic compounds), fill one of the primary sample containers, followed by one of the sample containers for the duplicate (and triplicate), then fill the second primary sample container, followed by the second sample container for the duplicate (and triplicate). Repeat filling one container at a time until all sample containers for that analyte are filled. Then continue onto the containers for the next analytical method.
- If insufficient groundwater is present in the target well for the collection of a duplicate for the targeted analytical suite, an attempt will be made to collect a duplicate at an alternate well. When recurring sampling provides information about the likely range of results, duplicate samples will be collected from locations where concentrations are likely to be above five times the method detection limit (MDL) for the analyzed compounds to allow relative percent difference (RPD) calculations.
- Label replicate samples according to the SAP/QAPP.
- Document the primary and duplicate sample identifications in field notes.

2.3 Documentation

Field documentation includes complete monitoring forms and other field notes deemed relevant. It is essential that field forms be filled out completely and legibly at each location, and that entries are consistent for each location and among different personnel. Field documentation should be completed in accordance with SOP-1.

2.4 Decontamination of Groundwater Sampling Equipment

Sampling equipment should be decontaminated in accordance with SOP-11.

2.5 Investigation-Derived Waste Management

Purge water is to be contained on-site in an appropriate, labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as personal protective equipment, are to be properly handled and disposed. Preferably, PPE IDW

should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site, should remain on-site. Refer to SOP-13.

SECTION 3 QUALITY CONTROL GUIDANCE

Follow the quality control requirements specified in the SAP/QAPP, RI WP, and/or project-specific regulatory requirements, as applicable. These may include collecting additional samples for field duplicates, equipment-rinsate blanks, field blanks, or matrix spike/matrix spike duplicates. Samples may also need to be shipped with trip and/or temperature blanks.

SOP NO. 10

Sample Packaging and Shipping

SOP No. 10
Sample Packaging and Shipping

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) presents methods for shipping non-hazardous materials, including most environmental samples via United Parcel Service (UPS), FedEx, or courier service.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

This SOP establishes packaging and shipping requirements and guidelines for environmental sample shipping. Proper packaging and shipping is necessary to protect the integrity of environmental samples shipped for analysis.

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Chain-of-custody forms
- Chain-of-custody seals
- Shipping manifests (e.g., UPS or FedEx)
- Sample labels

- Coolers or ice chests
- Cubed ice, block ice, blue gel ice, or dry ice (enough to ensure samples will remained chilled through transit)
- Sorbent material
- Heavy duty plastic overwrap bags (cooler size)
- Zip-top bags of various sizes
- Bubble-wrap
- Zip ties
- Strapping, packing, or duct tape
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

1. If using a new cooler, select a sturdy cooler in good condition. Secure and tape the drain plug (inside and outside) with duct tape. If shipping in an existing cooler, verify the drain plug is sealed, empty any melted ice water, if present, and dry the inside of the cooler with paper towels. Discard paper towels in accordance with SOP-13.

2. Inspect sample containers. Check that caps on bottles and jars are tight (will not leak); check to see that sample labels are legible and match the chain-of-custody, and chain-of-custody records are properly completed. Replace labels, if needed.

3. Place absorbent pads in the bottom of the shipping container to absorb liquids in the event of sample container breakage. Transportation regulations require absorbent capacity of the material to equal the amount of liquid being shipped; each pad absorbs approximately 1 quart of liquid.

4. Place 2 to 4inches of packing peanuts or two layers of large-bubble bubble wrap on the bottom of the cooler.

5. Place a clear, cooler-size overwrap bag in the cooler and directly place one layer of cubed ice and a temperature blank on the bottom of the bag. Alternately, double-bag cubed ice in

large, plastic, zip-top bags and properly seal. Place bagged ice in the overwrap bag. Reusable blue gel ice blocks, block ice, or dry ice may also be suitable for keeping samples chilled. An equal weight of ice substitute should be used to keep the samples below 4 degrees Celsius for the duration of the shipment (up to 48 hours). The method of sample chilling should be chosen with care so that the collected samples are not physically or chemically damaged.

6. Place bottles and jars in separate and appropriately-sized plastic zip-top bags and close the bags. Up to three volatile organic compound (VOC) vials may be packed in one bubble wrap envelope placed inside a zip-top bag; alternatively, nine VOC vials may be packed in a foam cube with vial slots, with the cube packed in a zip-top bag. Glass bottles should be wrapped in bubble wrap before placing in zip-top bags.

7. Place the bottles in the bag with sufficient space to allow for the addition of a second layer of ice bags over the sample containers[10]. It is preferable to place glass sample bottles and jars into the cooler vertically. Due to the strength properties of a glass container, there is much less chance for breakage when the container is packed vertically rather than horizontally.

8. Place the second layer of ice or ice bags on top of the samples. Close and securely fasten the top of the large overwrap bag with tape (preferably a tight zip tie).

9. Place the completed chain-of-custody record for the laboratory into a plastic zip-top bag, tape the bag to the inner side of the cooler's lid, and then close the cooler.

10. Use waterproof pens and labels on sample containers, seals, and paperwork.

11. Wrap packing tape around each end of the cooler two times and affix the completed chain-of-custody seals to the top opposite sides of the cooler half on the tape so that the cooler cannot be opened without breaking the seal. Wrap clear tape over custody seals.

12. Arrow labels, which indicate the proper upward position of the container, should be affixed to the cooler, and shipping containers must be marked with THIS END UP. A label containing the name and address of the shipper shall be placed on the outside of the container. Labels used in the shipment of hazardous materials (such as Cargo Only Air Craft, Flammable Solids, etc.) are not permitted to be on the outside of the container used to transport environmental samples and shall not be used.

[10] Exposure of filled VOC vials to other types of sample containers, by placing them in the same shipping container, is not recommended. Various non-VOC sample containers are solvent-rinsed, which may contaminate the VOC vials before or after sample collection. Therefore, a separate shipping container for VOC vials is recommended.

Samples shipped to each analytical laboratory can be sent by UPS or FedEx on a next-day basis unless other arrangements are made. Ice chests, used to refrigerate perishable items, can be used to convey non-hazardous samples to the analytical laboratory.

Specific requirements for packaging materials may apply if the samples being shipped are known to be hazardous materials (samples are not considered hazardous waste and therefore manifest requirements do not apply). Carriers holds shippers responsible for damage occurring in the event of accidents when a hazardous material is shipped as a non-hazardous material. Samples which obviously are hazardous materials should therefore be shipped as such, and samples which most likely are not hazardous materials should be shipped in coolers.

Guidelines for shipping hazardous materials by carrier can be accessed through their websites or by contacting a local shipping location. Specific labels for shipping of hazardous materials are available.

Chain-of-custody documentation should accompany shipments of samples to the analytical laboratory. Often, the chain-of-custody document contains an analytical request section which may be completed following sample collection. Chronological listing of collected samples is desirable. A copy of the completed chain-of-custody form should be retained in the event that the original form is lost or destroyed.

It should be noted that samples retained by the analytical laboratory that are not chosen for analysis may be subject to a fee for disposal. Often a disposal fee is assigned to a sample, typically soil, that has been retained beyond standard analytical holding periods. Therefore, consultation with project management is recommended to determine which samples may be of interest. Contacting the selected analytical laboratory regarding disposal policies is also recommended. Arrangements may be made with the analytical laboratory for return of the unanalyzed samples for later disposal to the area of origin.

SOP NO. 11

Equipment Decontamination and Rinsate Blanks

SOP No. 11
Equipment Decontamination and Rinsate Blanks

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) was prepared to direct field personnel in the methods for decontamination of field equipment used in the investigation of sites with potentially hazardous or dangerous waste.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objective of equipment decontamination is to remove potential contaminants from a sampling device or item of field equipment prior to, between, and after collection of samples for laboratory analysis and limit personnel exposure to residual contamination that may be present on used field equipment. Proper decontamination procedures also minimize the potential for cross-contamination among sampling points on a single site or between separate sites.

1.3 Field Equipment and Supplies

The following methods may be used to decontaminate equipment. Site-specific conditions may warrant the use or deletion of items from this list.

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms

- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Alconox, Liquinox, or other non-phosphate concentrated laboratory grade detergent.
- Rinse solutions, such as methyl alcohol (methanol), dilute nitric acid (0.1 molar), deionized or distilled water, and/or tap water. Deionized water is preferable to distilled water because the deionization process typically results in greater removal of organic compounds, as discussed below:
- Acid rinse (inorganic desorption) 10% nitric or hydrochloric acid solution reagent grade nitric or hydrochloric acid and deionized water (1% to be used for low carbon steel equipment).
- Solvent rinse (organic desorption isopropanol, acetone, or methanol; pesticide grade).
- Deionized water is preferable to distilled water because the deionization process typically results in greater removal of organic compounds.
- Multi-gallon storage containers filled with potable water to be used for rinsing or washing.
- Distilled/deionized and/or per- and polyfluoroalkyl substances (PFAS)-free water from the analytical laboratory.
- Spray bottles, squirt bottles, pump sprayers, or garden sprayers to apply rinse liquid. A separate bottle should be used for each liquid.
- Steam cleaner with power source and water supply.
- Two or three containers (e.g., 5-gallon buckets, or 5- or 10-gallon plastic tubs) for dip rinsing, washing, and collection of rinse water.
- Two or three utility brushes or test tube brushes for removal of visible contamination. A test tube brush (or similar) can be stapled to the end of a dowel and used to clean the inside of a narrow equipment.
- Paper towels.
- Sample bottles for rinsate blanks.
- Aluminum foil.
- Garbage or other plastic bags to wrap clean sampling equipment after decontamination, to store sampling equipment or/and to dispose of decontamination debris.
- Department of Transportation (DOT)-approved container(s) (e.g., 55-gallon drum) to store contaminated wash and rinse water.
- Polyethylene sheeting.
- Personal protective equipment (PPE) as required by HASP.

- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 PROCEDURES

2.1 General

The following procedures should be used for decontaminating field equipment. Procedures will vary with equipment used and potential contaminants present at the Site.

2.2 Procedure for Soil Sampling Equipment

Soil and sediment sampling equipment, such as trowels, spoons, bowls, and spatulas should be cleaned using the following procedures:

1. Prepare 5-gallon buckets with decontamination solutions at the recommended concentration, at a minimum:

    a. One bucket will contain potable water for the removal of solids from the device.

    b. One bucket will contain a solution of detergent, such as Alconox, and distilled water for decontaminating devices.

2. Physically remove adhered soil or other solids from the device to the extent practical using paper towels, scraping, or potable water.

3. Wash the device in the detergent solution using a brush. The device should be rinsed with distilled water from a pump sprayer. Collect rinsate in a 5-gallon bucket for disposal per SOP-13.

4. If needed, steam clean the sampling equipment. The steam cleaner is effective in removing contamination, especially volatile hydrocarbons. Steam cleaning is highly recommended in most cases and sometimes is the only method for decontaminating equipment that is grossly contaminated with hydrocarbons.

5. Rinse equipment by dipping in rinse solution, spraying, or pouring solution over it. Dip rinsing can introduce contaminants into solution. Spraying might not allow a thorough rinsing of the equipment, but it is a more efficient rinsing method because less rinse solution is used. Appropriate rinsing solutions are specified in the SAP. Some typical solutions are:

    a. Methanol (used to remove organic compounds)

b. Dilute acids (used to remove metals and other cations)

c. Tap water

d. Deionized/distilled water

6. Rinse the sampler with generous amounts of deionized water. Pouring water over the sampler is best, although spraying or using a squirt bottle to apply rinse water might be adequate if trying to minimize waste.

7. Prepare rinsate blanks. To ensure proper decontamination, submit a rinsate blank for analysis. It is best to do this just before sampling. The blank should be analyzed for the same chemicals as the samples and for the chemical used to clean equipment, if appropriate.

8. Wipe sampling equipment with a paper towel or allow it to air dry. Reassemble equipment, if necessary, and wrap completely in clean, unused aluminum foil (shiny side out) for transport or storage in an undisturbed location that is free of contamination. Only immediate reuse of equipment on the same day without wrapping in foil is acceptable.

9. Drum spent cleaning solutions for disposal, along with any other contaminated fluids generated during the field investigation for disposal per SOP-13.

10. Record the decontamination procedure in the field logbook or on appropriate field form.

Note that if temperature or humidity conditions preclude air drying equipment, sufficient spares should be available so that no item of sampling equipment need be used more than once before drying. Alternatively, the inability to air dry equipment completely prior to reuse should be noted in the field logbook or applicable field form. In this case, additional rinses with distilled/deionized water should be used and recorded.

If NAPL cannot be fully removed from equipment, the device should be disposed. A spare should be used to replace the equipment.

2.3 Procedure for Groundwater Sampling Equipment

Groundwater may be collected using disposable equipment (such as bailers and low-density polyethylene [LDPE] tubing) or using submersible pumps placed down the monitoring wells. Peristaltic pumps used with tubing will remain at the surface. Disposable equipment should be used once and disposed of per SOP-13. Submersible pumps should be decontaminated by spraying with a detergent and distilled/deionized water solution, rinsed with clean water, and wiped with a clean paper towel.

Monitoring instruments that come into contact with sampled materials must be cleaned, along with sampling devices. They should be washed or at least rinsed before monitoring other sampling sites.

2.4 Procedure for Oversized Equipment

Because heavy pieces of equipment (e.g., drill rigs and support vehicles) are much larger than sampling equipment and generally come in less direct contact with sampling aliquots, a modified decontamination procedure is appropriate. Dry decontamination, which includes physical removal of solids by brushing, should be performed on large equipment tires or tracks to remove potentially contaminated solids that originate from site surfaces.

Large equipment that comes in contact with potential downhole contamination (e.g., core barrels), both as part of subsurface equipment advancement and aboveground contact with extracted soil or groundwater should be decontaminated prior to and after use. Large equipment should be decontaminated by:

- A high-pressure steam cleaner to clean the inside and outside of drilling equipment. Liquid and solid material produced from this operation should be collected on a decontamination pad and managed as described in the SOP-13.

OR

- Following procedures outlined in Section 2.2 above. If 5-gallon buckets are not adequately sized for the larger equipment, a wash pad should be used. The wash pad may consist of a bermed area lined with plastic sheeting with a sump at one corner. The liquids from the wash pad may be left to evaporate during the field day; however, a sump pump should be used to remove water from the sump and transfer it to a drum at the end of each day, at a minimum. Decontamination water should be collected for disposal per SOP-13.

New, unused core liners should be rinsed with site water at the sample location prior to deployment.

2.5 Collection of Equipment Rinsate Blank

To prepare an equipment rinsate blank, pour laboratory-supplied, analyte-free water through or over the equipment. Collect the rinsate water in a clean, laboratory-supplied container(s). It is advisable to prepare one rinsate blank every day in the field. The blank should be tested for the same analytical suite as the primary samples.

SECTION 3 INVESTIGATION-DERIVED WASTE

Spent decontamination materials are to be contained on-site in an appropriate labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as personal protective equipment, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain on-site. Refer to SOP-13.

SOP NO. 12

Personnel Decontamination

SOP No. 12
Personnel Decontamination

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) describes field procedures typically followed by field personnel for decontamination. Decontamination of personnel is critical to health and safety during and after environmental fieldwork.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

This SOP's objective is to protect personnel from hazardous substances that can contaminate and eventually permeate protective clothing, respiratory equipment, tools, vehicles, and other equipment used on-site. Decontamination reduces exposure of site personnel to such substances by minimizing the transfer of harmful materials into clean areas and preventing the mixing of incompatible chemicals. It also protects the community by preventing uncontrolled transportation of contaminants from the site.

1.3 Field Equipment and Supplies

The materials, equipment, and facilities described in the following list are not required in every case of personnel decontamination; however, they represent the extent that might be required for sites where maximum decontamination procedures are necessary.

- Indelible ink pens

- Field logbook(s), bound
- Task-specific field forms
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Sample containers as specified in the SAP/QAPP
- Drop cloths (plastic or other suitable material) on which heavily contaminated equipment and outer protective clothing can be deposited.
- Collection containers, such as drums or suitably lined trash cans, for storing disposable clothing, heavily contaminated personal protective clothing, or equipment that must be discarded.
- Lined box with absorbent for wiping or rinsing off gross contaminants and liquid contaminants.
- Large tubs to hold wash and rinse solutions. Tubs should be at least large enough to hold a worker's booted foot and allow full access for washing.
- Non-phosphate wash solutions (e.g., Alconox, Liquinox) to wash off debris and chemicals and reduce hazards associated with any contaminants.
- Rinse solutions (e.g., potable or distilled water) to remove contaminants and contaminated wash solutions.
- Long-handled soft-bristled brushes to wash and rinse off contaminants.
- Paper or cloth towels for drying protective clothing and equipment.
- Lockers or containers for storage of cleaned non-disposable clothing (e.g., hard hat, boots) and equipment.
- Department of Transportation (DOT)-approved containers for contaminated wash and rinse solutions.
- Plastic sheeting, sealed pads with drains, or other appropriate means of secondary containment of contaminated wash and rinse solutions that might be spilled during decontamination.
- Shower facilities for full body wash or, at a minimum, wash sinks available to personnel.
- Soap or wash solution, wash cloths, and towels for personnel.
- Lockers or containers for clean clothing and personal item storage.
- Investigation-derived waste (IDW) equipment and supplies (SOP-13)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder

- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

SECTION 2 DECONTAMINATION PROCEDURES

2.1 Level C PPE

At a minimum, the following procedures apply when operating in a Level C exclusion zone:

1. Deposit items used on-site on plastic drop cloth. Segregation at the drop site reduces the probability of cross-contamination.

2. Scrub outer boots, gloves, and splash suit with decontamination solution or detergent water. Rinse items with generous amounts of water. Follow this step scrupulously for protective clothing that is not disposable.

3. Remove outer boots and gloves and deposit or discard them in container with plastic liner.

4. To continue decontaminating outside the exclusion zone, change canister or mask when leaving the zone. Upon re-entering, remember to gear up again.

5. Remove boots, chemical-resistant splash suit, and inner gloves and deposit them in separate containers lined with plastic.

6. Remove the respirator by taking off face piece. Avoid touching the face with the fingers. Deposit the facepiece on a plastic sheet.

7. As a field wash, clean hands and face thoroughly and shower as soon as possible. Wash respirator facepiece with respirator decontamination solution.

8. Ensure that decontamination procedures are in accordance with the project Sampling and Analysis Plan (SAP) and SOPs.

2.2 Level D PPE

If operating in a Level D area, perform the following procedures before leaving the site:

1. Wash and rinse reusable equipment and garments. If gear is to be used elsewhere, wash it with detergent and then rinse with generous amounts of water.

2. If grossly contaminated, discard disposable protective clothing in appropriate container.

3. Wash hands and face thoroughly and shower as soon as possible.

2.3 Emergency Decontamination Procedures

1. If the decontamination procedure is essential to the lifesaving process, decontamination must be performed immediately.

2. If a heat-related illness develops, protective clothing should be removed as soon as possible. Protective clothing and equipment should be washed, rinsed, and/or cut off.

3. If medical treatment is required to save a life, decontamination should be delayed until the victim is stabilized or until decontamination will not interfere with medical treatment.

4. Dispose of contaminated clothing and equipment properly.

5. Alert medical personnel to the emergency.

6. Instruct medical personnel about potential contamination.

7. Instruct medical personnel about specific decontamination procedures.

2.4 Special Notes

When working in an exclusion zone, be sure that the decontamination area is placed in an upwind direction (plus or minus 20 degrees) from the site.

SECTION 3 INVESTIGATION-DERIVED WASTES

Spent decontamination materials are to be contained on-site in an appropriate labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as personal protective equipment, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain on-site. Refer to SOP-13.

SOP NO. 13

Handling and Disposal of Investigation-Derived Waste (IDW)

SOP No. 13
Handling and Disposal of Investigation-Derived Waste (IDW)

SECTION 1 INTRODUCTION

1.1 Overview

This Standard Operating Procedure (SOP) was prepared to provide instructions to field personnel for the management and disposal of investigation-derived waste (IDW).

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

Environmental site investigations usually generate some regulated waste, particularly if the project involves drilling and construction of monitoring wells. Any potentially hazardous or dangerous material that is generated during a site investigation must be handled and disposed of in accordance with applicable regulations (WAC 173-303). This SOP provides a procedure to be used for dealing with IDW that has the potential of being classified as hazardous or dangerous. IDW generated during this RI may include:

- Soil
- Groundwater
- Non-aqueous phase liquid (NAPL)
- Site debris
- Personal protective equipment (PPE)

- Disposable sampling equipment
- Disposable field supplies (i.e., paper towels, plastic sheeting, etc.)
- Spent decontamination liquids

1.3 Field Equipment and Supplies

- Indelible ink pens
- Field logbook(s), bound
- Task-specific field forms
- Personal protective equipment (PPE) and air monitoring equipment (if needed) as specified in the HASP
- Department of Transportation (DOT)-approved packaging
- Funnel
- Bushing wrench
- 15/16-inch socket wrench
- Shovel
- Appropriate markers (spray paint, paint pen)
- Plastic sheeting
- Drip pans
- Pallets
- Plastic trash bags
- Equipment decontamination supplies (SOP-11)
- Personnel decontamination equipment (SOP-12)
- Project documentation (RI WP, HASP, SAP, QAPP) in secure storage, such as a file tote, storage clipboard, or accordion folder
- Project contact information list (site, project team, laboratory, and/or subcontractor contacts, etc.)

IDW should be managed to limit exposure of site personnel to hazardous materials and to prevent introduction of contaminated materials to uncontaminated environmental media at the site. The following SOPs establish protocols for testing, storage, and disposal of these materials.

Disposal of laboratory test equipment and supplies should be handled in accordance with the laboratory QAPP.

SECTION 2 GENERAL

This SOP discusses factors to consider as part of an IDW management program. These factors include protectiveness of human health and the environment, land disposal restrictions, storage requirements, recordkeeping and manifesting, and handling of non-Resource Conservation and Recovery Act (RCRA) hazardous wastes. The IDW management program described in this section incorporates these factors in the program.

IDW identified as potentially contaminated with hazardous materials should be stored in a designated and clearly marked IDW management area at the site. The volume of waste should be minimized, to the extent possible, whenever applicable. Containers used to store IDW should be clean and DOT-approved, such as 55-gallon drums with bolt-secure open-top lids, or other acceptable containers. Containers/drums will also be clearly labeled to indicate the generator name and address, site name and location, material type (e.g., soil, groundwater, NAPL, decontamination liquid), date sealed, location, and origins (e.g., well identification [ID], soil boring location ID). Containers that are used for temporary storage to containerize media overnight should be clearly marked as "Temporary" and include the information listed above.

IDW from multiple locations may be consolidated in the same container provided that consolidated locations are grouped to the extent practicable based on (1) the perceived level of impact, and (2) the area of the site they were generated.

The IDW storage area should be inspected daily and documented on field forms to ensure that storage procedures are adequate to keep the IDW isolated and contained. Storage procedures checked during inspections include but are not limited to the following:

- Labels are properly filled out
- Container covers and bungs are kept closed
- Containers are compatible with contents
- Incompatible waste is separated
- Containers are stored to prevent spills
- No leaks or puddles on drumheads

Any violations of these procedures should be documented and remedied as quickly as possible. The containers or drums should be kept on-site until the IDW has been analyzed for hazardous materials and characterized for waste disposal, then the IDW should be transferred to and disposed of at a permitted landfill.

SECTION 3 MEDIA-SPECIFIC IDW MANAGEMENT

3.1 Soil

Waste soils may be generated from drilling and excess sample material. The required testing and handling of this IDW will depend on its origin and characteristics. Visual observations and photoionization detector (PID) field screening should be used to determine if the soils contain potentially elevated levels of hazardous materials.

3.2 Groundwater

Groundwater waste may be generated as excess sample material and from redeveloping and purging monitoring wells. Groundwater should be temporally stored in 5-gallon buckets with lids, then transferred to 55-gallon bung-type drums in the IDW management area. Field personnel will observe the waters for visible NAPL or sheen.

3.3 NAPL

Free-product of NAPL may be present in some monitoring wells. Extracted NAPL should be containerized separately from groundwater to the extent possible. NAPL should be temporally stored in 5-gallon buckets with lids, then transferred to 55-gallon drums in the IDW management area. NAPL should be stored in separate drums and not mixed with other fluids. Soiled buckets should be disposed of as solid waste as described below.

3.4 Personal Protective Equipment

PPE consists of gloves, protective clothing, and other one-time use equipment used during the field investigation. Used PPE should be containerized in plastic garbage bags and disposed in a municipal landfill.

3.5 Decontamination Liquids

Decontamination liquids containing soap solution should be stored in 5-gallon buckets with lids, then transferred to 55-gallon drums in the IDW management area. Isopropyl alcohol solutions will not be mixed with other decontamination liquids in the drums and should be managed separately to prevent incidental chemical reactions and for ease of disposal. Decontamination liquids should be contained separately from groundwater, and decontamination liquid used for NAPL removal should be stored separately from other decontamination liquid.

3.6 Other Materials

Trash and refuse generated during field activities, such as plastic sheeting, sampling containers, paper towels, plastic bags, tarps covering non-contaminated soils, potable water containers, disposable PPE, and other disposable equipment that is free from hazardous materials should be containerized in plastic garbage bags and stored on-site for subsequent transport to the municipal landfill.

Materials that have visible NAPL, such as soiled buckets and NAPL-contaminated polyvinyl chloride (PVC) sampling sleeves, should be drummed and stored in the IDW management area.

Non-disposable or bulky materials may be decontaminated per SOP-11 and reused or disposed of as solid waste.

SECTION 4 TESTING AND DISPOSAL

Drummed materials should be chemically analyzed to determine the proper disposal method. Composite samples should be collected from each drum for analysis. Composite samples should be collected such that reasonable likelihood exists that the entire volume of material in a drum is represented in the sample.

Composite samples should be tested for the parameters identified in the QAPP. Modifications of this analyte list may be made based on specific knowledge of the origin and likely contaminants in the materials.

Composite sample results should be used to characterize the IDW for disposal. IDW will be shipped to an appropriate licensed disposal facility following further required waste characterization or stabilization. Disposal of IDW should be completed within 90 days of completing waste characterization after the completion of field activities.

SOP NO. 14

Sampling for Per- and Polyfluoroalkyl Substances (PFAS)

SOP No. 14
Sampling for Per- & Polyfluoroalkyl Substances (PFAS)

SECTION 1 INTRODUCTION

1.1 Overview

This SOP outlines general practices and field procedures for collecting samples for per- and polyfluoroalkyl substances (PFAS) analysis via USEPA Method 1633. Please note that PFAS are emerging contaminants; therefore, this SOP is a working document and intended to be modified as new information becomes available.

The SOP should be implemented in accordance with the following governing documents:

- Remedial Investigation Work Plan (RI WP), which provides an overview of the Mill Property background and conceptual site model and describes the overall investigative goals and scope of work.
- Health and Safety Plan (HASP), which identifies physical, chemical, and biological hazards relevant to each field task and provides hazard mitigators to address these hazards.
- Sampling and Analysis Plan (SAP), which provides details for field sampling and procedures and will be most frequently used by field personnel.
- Quality Assurance Project Plan (QAPP), which establishes protocols necessary to generate data of a quality sufficient to ensure that valid conclusions are drawn from the RI.

1.2 Objective

The objectives of this document are to outline and clearly define sampling precautions and procedures specific to PFAS and to list acceptable materials and field equipment as well as those materials and equipment which may contain PFAS and should be avoided and define sample documentation and packaging procedures.

1.3 Field Equipment and Supplies

Equipment required in SOP-3, SOP-4, and SOP-7, the additional provisions for PFAS sampling equipment and supplies are provided below.

SECTION 2 BACKGROUND AND SAMPLING PRECAUTIONS

PFAS are a family of man-made compounds that do not naturally occur in the environment. They have a large number of industrial uses and are found in many commercial products because of their

properties to resist heat, oil, grease, and water. PFAS are potentially present in a variety of equipment, products, and materials that are commonly used in the field during groundwater sampling. Laboratory analytical reporting limits (RLs) are very low (low nanograms per liter concentrations); therefore, conservative precautions should be taken to avoid sample cross-contamination and false positive results.

Sampling equipment used around or during sampling must be identified as PFAS-free prior to using in the field. Pre-wrapped food or snacks should not be present in the sampling and staging areas during sampling due to the potential for PFAS contamination from the packaging. Many personal care products (PCPs), such as cosmetics, shampoo, sunscreens, and dental floss, have also been documented to contain PFAS, and should be avoided prior to and on the day of sampling. However, measures can be taken to avoid cross-contamination from PCPs, like moving away from the sampling area to remove personal protective equipment (PPE) and apply PCPs and washing hands thoroughly after applying or handling PCPs.

The field crew will review a daily checklist (Attachment 1) to remind them of precautions to minimize the risk of cross-contaminating samples before the start of sampling. Field personnel will always wear disposable nitrile gloves during sample collection and handling. Staff will don a new pair of nitrile gloves prior to conducting the following activities:

- Collecting a sample
- Changing sampling locations
- Handling sample bottles, cooler ice, or PFAS-free water
- Handling QA/QC samples, including field blanks and equipment blanks
- Handling sampling equipment

Staff will wash hands thoroughly and don a new pair of nitrile gloves after the following activities:

- Coming in contact with a material potentially containing PFAS
- Entering the project site sampling area

SECTION 3 PROCEDURES

3.1 Sample Collection

Prior to field mobilization, specific sample locations and quantities should be selected. Detailed guidance on groundwater and soil PFAS sampling can be found through Michigan Department of Environment, Great Lakes, and Energy General PFAS Sampling Guidance, which lists acceptable PFAS-free sampling equipment, methods, and procedures for PFAS sampling.

The following sample procedures should be followed for aqueous and solid samples collected for PFAS analysis by USEPA Method 1633:

1. Prepare for sample collection. The sample schedule should be coordinated to collect samples representative of standard operating conditions, if applicable.

2. Obtain sample containers from the specified laboratory performing the analysis and verify they are certified as PFAS-free. Containers must not be opened prior to sample collection and should be kept sealed.

3. Fill out the sample labels, chain-of-custody, and other documentation necessary related to sampling on the day of sample collection and in an area away from the sampling location.

4. Wash hands prior to donning a new, clean pair of nitrile gloves and prior to handling of sample containers or sampling equipment.

5. After donning a new pair of nitrile gloves, collect the sample for PFAS first, prior to collecting samples for other parameters into other containers; this avoids contact with other type of sample container, bottles or packaging materials that may have PFAS-related content.

6. Do not place the sample bottle cap on a surface when collecting the sample and avoid contact with the inside of the sample bottle or its cap.

7. Once the sample is collected, capped, and labeled, place the sample bottle(s) in an individual resealable plastic bag of allowable material (e.g., zip-top) and place in an appropriate cooler packed only with regular ice (preferably from a verifiable PFAS-free source; do not use blue ice packs) double bagged within the cooler.

8. Collect remaining samples as required. This includes remaining quality assurance/quality control (QA/QC) samples, at the frequency described in the SAP/QAPP.

9. Make sure the chain-of-custody is properly filled out [away from the sample location(s)], signed, placed in a polyethylene (or zip-top) bag, and placed inside the cooler. Only wet ice may be used for shipping PFAS samples. Blue or other ice substitutes will not be used.

10. If shipping samples to the laboratory, add custody seals and use clear, plastic tape to close before sending via overnight delivery. Samples must be shipped as soon as possible and within 1 day of collection to ensure samples arrive and are analyzed within the lab specified holding time.

3.2 Well Gauging

Groundwater levels should be measured in accordance with SOP-6.

3.3 Groundwater Purging

Groundwater should be purged in accordance with SOP-7. Additional purging procedures described below should be followed for PFAS sampling of groundwater.

Dedicated silicone, vinyl, or HDPE tubing should be used for the PFAS sampling event. During the PFAS sampling event, tubing will not be decontaminated or reused from one location to another. A PFAS-free bladder pump should be used to collect samples. In general, the following method should be used for purging groundwater monitoring wells prior to sample collection:

1. Assemble the PFAS-free pump and sampling line components in an area free from PFAS. Ensure that the discharge line is affixed so that the initial discharge is captured in a graduated cylinder or purge water collection bucket or drum.

2. Start the pump. Slowly increase the speed of discharge if using a variable speed pump.

3. Maintain laminar flow throughout the sample tubing and flow-through cell; keep all lines and the cell completely filled and air-free during parameter measurement and sampling.

4. Adjust the purge rate to minimize and stabilize drawdown, as measured by the water level probe. Typical low-flow pumping rates are between approximately 100 and 500 milliliters per minute; actual rates should be recorded on field forms (see SOP-7).

5. Once drawdown is stable, start recording water quality parameters (See SOP-8), purge volumes, and well drawdown.

6. Continue to measure and record the groundwater parameters until the parameters stabilize, the well is pumped dry, or three well volumes have been removed. If a dedicated pump or tubing containing PFAS is present in the well, efforts should be made to purge at least three well volumes prior to returning to low flow rates and initiating sampling. Stabilization of water quality indicators is typically defined as follows: pH – three successive readings within ±0.1 pH unit; specific conductance – three successive readings within ±3%; temperature – three successive readings within 0.5 °C; and turbidity – three successive readings within ±10% and less than 10 Nephelometric Turbidity Units (NTUs). Parameter stability is an indication that the well has achieved stable, laminar flow and well water is in equilibrium with the surrounding aquifer.

3.4 Groundwater Sampling

Groundwater samples should be collected in accordance with SOP-7. Additional sampling procedures described below should be followed for PFAS sampling of groundwater. The following sequence should be used to collect groundwater samples:

1. Disconnect the tubing from the analytical field meter.

2. Remove the cap from the sample container.

3. Place the sample container under the water stream. Fill the container to the level specified by the laboratory (samples do not need to be collected headspace free) and then turn off the pump.

4. Close the container by screwing on the cap.

5. Using a paper towel, dry the outside of the sample container if necessary.

6. Label the sample as described in the SAP/QAPP.

7. Decontaminate reusable equipment prior to proceeding to the next groundwater monitoring well location, as described in SOP-11.

Turbid samples will not be field filtered. Samples received by the laboratory that are turbid or contain sediment, despite purging efforts, should be centrifuged prior to supernatant extraction and sample processing. This practice is consistent with the United States Department of Defense*, Data Validation Procedure for Per- and Polyfluoroalkyl Substances*, Quality Systems Manual for Environmental Laboratories Table B-15 (DOD 2020) that states that "samples with >1% solids may require centrifugation prior to [solid phase extraction] SPE extraction." The need to centrifuge a sample should be determined based on laboratory recommendation, in lieu of sample dilution, which would raise RLs.

3.5 Soil Sampling

In addition to procedures outlined in SOP-4, the additional sampling procedures listed below should be followed for PFAS sampling of subsurface soil cores:

1. Prior to collecting the soil sample, insert an acetate or other PFAS-free liner into the barrel of soil coring mechanism.

2. Once the soil core barrel is removed from the ground, remove the liner and soil core and place them on a cutting board. Use a liner cutting device to open the liner. Cut open the core to reveal a "clean" face for sampling. This process avoids the possibility of picking up contaminants that may have gotten smeared onto the soil surface as the soil core entered the liner (EGLE 2024b).

3. Collect the PFAS sample from the clean face using a stainless steel spoon or similar PFAS-free tool and deposit into the sample bottles. Fill the required lab-provided sample bottles, taking care not to overfill sample bottles, or dump soil out of the bottle. Cap the bottle, avoiding contact with the inside of the lid. Collect the duplicate sample immediately following the collection of the parent sample, if appropriate.

3.6 Documentation

Field documentation includes completed monitoring forms, calibration records, and other field notes deemed relevant. It is essential that field forms be filled out completely and legibly at each location, and that entries are consistent for each location and among different personnel. Field documentation should be completed in accordance with SOP-1.

3.7 Decontamination of Sampling Equipment

Sampling equipment should be decontaminated in accordance with SOP-11. Additional decontamination procedures described below should be followed for PFAS sampling. Alconox, Liquinox, Luminox, or Citranox detergents in PFAS-free or potable water are acceptable for decontamination purposes. Decon 90TM should be avoided during decontamination activities.

Non-disposable sampling equipment that is in contact with groundwater (e.g., field probes, depth-to-water meters) must be decontaminated prior to and between uses at each sampling location according to the following procedures:

1. Remove any gross (e.g., soil) contamination from sampling equipment with a brush and/or rag.
2. Wash water-resistant equipment thoroughly and vigorously with PFAS-free or potable water containing detergent (Alconox, Liquinox, and Luminox) using a bristle brush or similar utensil to remove any remaining residual contamination.
3. Rinse equipment thoroughly with PFAS-free or potable water (first rinse).
4. Rinse equipment thoroughly with PFAS-free water (second rinse).
5. Complete a free-standing (i.e., non-bucket) rinse with PFAS-free water (third rinse). This free-standing rinse can be conducted with a spray bottle made from HDPE or by pumping/pouring PFAS-free water over the equipment.
6. Dry the wet equipment with a paper towel or leave the equipment to air dry in a location away from dust or fugitive contaminants.

Cleaning and decontamination of the equipment should be done in stages and in such a way that the contamination does not discharge into the environment. Disposable sample tubing is recommended to minimize the need for decontamination.

3.8 Investigation-Derived Waste Management

Purge water is to be contained on-site in an appropriate labeled container for disposal by the client unless other project-specific procedures are defined. Other investigation-derived wastes, such as personal protective equipment, are to be properly handled and disposed. Preferably, PPE IDW should also be containerized and left on-site for disposal by the client. As a matter of practice, any waste, or potential waste, generated on-site should remain on-site. Refer to SOP-13.

SECTION 4 QUALITY CONTROL GUIDANCE

Follow the quality control requirements specified in the SAP/QAPP, RI WP, and/or project-specific regulatory requirements, as applicable. These may include collecting additional samples for field duplicates, equipment-rinsate blanks, field blanks, or matrix spike/matrix spike duplicates. Samples may also need to be shipped with trip and/or temperature blanks.

SECTION 5 ATTACHMENT 1. DAILY SAMPLING CHECKLIST

Date: _____

Site Name: _____

Weather (temperature/precipitation): _____

Please check all boxes that apply and describe any exceptions in the notes section below along with QA/QC methods used to assess potential sample cross-contamination as a result.

Field clothing and personal protective equipment:

- ☐ No water- or stain-resistant boots or clothing (e.g., GORE-TEX)
- ☐ Boots made of polyurethane, PVC, rubber, or untreated leather
- ☐ Clothing has not been recently laundered with a fabric softener
- ☐ No coated HDPE suits (e.g., coated Tyvek suits)
- ☐ Field crew has not used cosmetics, moisturizers, or other related products today
- ☐ Field crew has not used sunscreen or insect repellants today, other than products approved as PFAS-free

Field equipment:

- ☐ Sample containers are made of HDPE or polypropylene, not LDPE
- ☐ Sample caps are made of HDPE or polypropylene and are not lined with Teflon
- ☐ No materials containing Teflon, Viton, or other fluoropolymers
- ☐ No materials containing LDPE in direct contact with the sample (e.g., LDPE tubing)
- ☐ Equipment in direct contact with the sample is made from stainless steel, HDPE, acetate, silicon, or polypropylene
- ☐ No plastic clipboards, binders, or spiral hard cover logbooks
- ☐ No waterproof field books
- ☐ No waterproof or felt pens or markers (e.g., certain Sharpie products)

- ☐ No chemical (blue) ice, unless it is contained in a sealed bag
- ☐ No aluminum foil
- ☐ No sticky notes (e.g., certain Post-It products)

Decontamination:

- ☐ Reusable sampling equipment decontaminated before and after each sample location
- ☐ "PFAS-free" water is on site for decontamination of sample equipment
- ☐ Alconox, Liquinox, Luminox or Citranox® used as decontamination detergent

Food and drink:

- ☐ No food or drink on-site, except within staging area
- ☐ Food in staging area is contained in HDPE or stainless-steel container (continued)

Wet weather (as applicable):

- ☐ Field staff rain gear is made of polyurethane, PVC, vinyl, wax-coated or rubber

Notes:

_____

_____

_____

_____

_____

Field Team Leader Name (Print): _____

Field Team Leader Signature: _____

Date/Time: _____

Geosyntec consultants

APPENDIX B
Previous Investigation Environmental Data Tables

Table B1: Data Summary Table - Groundwater

										TPH			Total Metals										
OA	Sample ID	Sample Date	pH	Temperature	Turbidity	Conductivity	Total Dissolved Solids	Total Organic Carbon	Oil & Grease	GRO	DRO	ORO	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc	Ammonia
	Units			°F	NTU	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
2004 Oil Spill at Woodmill Demolition Site (a)																								
A1	Woodmill Creek	2/10/2004	7.4	NA	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	7.7	NA	4	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	7.2	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	7	NA	9	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	6.8	NA	11	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	7.4	NA	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	7.5	NA	13	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	7.4	NA	4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	7.3	NA	4	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	7.2	NA	4	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	7.2	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	7.1	NA	16	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	7	NA	23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	7	NA	23	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	8.5	NA	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	8.6	NA	3	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	8	NA	7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																								
B1	B-1	5/22/2012	DRY	NA	NA	DRY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	8.77	NA	NA	1110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	8.15	NA	NA	650	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																								
B1	B-1	5/22/2012	8.16	46	NA	1270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	8.41	49	NA	1930	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	8.28	46	NA	1230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																								
A1	B1	10/8/2015	NA	NA	NA	NA	NA	NA	NA	**0.07**	**1.2**	**3.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	10/8/2015	NA	NA	NA	NA	NA	NA	NA	<0.05	**0.58**	**0.93**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	10/8/2015	NA	NA	NA	NA	NA	NA	NA	<0.05 / <0.05	**0.34 / 0.35**	**0.3 / 0.28**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B4	10/8/2015	NA	NA	NA	NA	NA	NA	NA	<0.05	**0.48**	**0.53**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	**0.063**	**0.27**	<0.28	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																								
C3	Telpole-20181026	10/26/2018		NA	NA	NA	NA	NA	NA	< 0.25	**2.5**	**2.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1996 Lady Island Seep Analysis																								
D1	Acid Ditch	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**388**	< 50	**22**	**33**	< 50	NA	< 20	< 10	NA	**470**	NA
D1	Acid Ditch	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**380**	< 50	**8**	**15**	< 50	NA	< 20	< 10	NA	**109**	NA
D1	Clarifier Outlet	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**24**	< 50	< 5	**13**	< 50	NA	< 20	< 10	NA	**25**	NA
D1	Clarifier Outlet	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**39**	< 50	< 5	< 10	< 50	NA	< 20	< 10	NA	**22**	NA
D1	East Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**354**	< 50	< 5	< 10	< 50	NA	< 20	< 10	NA	< 10	NA
D1	West Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**701**	< 50	< 5	< 10	< 50	NA	< 20	< 10	NA	< 20	NA

Table B1: Data Summary Table - Groundwater

													VOCs								
OA	Sample ID	Sample Date	Boron	Calcium	Chloride	Iron	Magnesium	Manganese	Nitrate	Potassium	Sodium	Sulfate	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
		Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2004 Oil Spill at Woodmill Demolition Site (a)																						
A1	Woodmill Creek	2/10/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																						
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																						
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																						
A1	B1	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B4	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																						
C3	Telpole-20181026	10/26/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1996 Lady Island Seep Analysis																						
D1	Acid Ditch	8/15/1996	NA	**211**	NA	**3.4**	**64**	**2.91**	NA	NA	**626**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Acid Ditch	9/30/1996	NA	**215**	NA	**1.79**	**104**	**1.37**	NA	NA	**550**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	8/15/1996	NA	**214**	NA	**0.2**	**6**	**0.06**	NA	NA	**184**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	9/30/1996	NA	**36.7**	NA	**0.38**	**7.55**	**0.08**	NA	NA	**85.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	East Seep	9/30/1996	NA	**198**	NA	**70.5**	**65.1**	**8.67**	NA	NA	**83.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	West Seep	9/30/1996	NA	**297**	NA	**118**	**148**	**3.08**	NA	NA	**52.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chlorotoluene	2-Hexanone	4-isopropyltoluene	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2004 Oil Spill at Woodmill Demolition Site (a)																							
A1	Woodmill Creek	2/10/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																							
A1	B1	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B4	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																							
C3	Telpole-20181026	10/26/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.0	NA	NA	NA
1996 Lady Island Seep Analysis																							
D1	Acid Ditch	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Acid Ditch	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	East Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	West Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	Bromoform	Bromomethane	Carbon Disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethylbenzene	Hexachlorobutadiene	Isopropylbenzene	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2004 Oil Spill at Woodmill Demolition Site (a)																							
A1	Woodmill Creek	2/10/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																							
A1	B1	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B4	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																							
C3	Telpole-20181026	10/26/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.0	NA	NA	NA	NA	<4.0	NA	NA
1996 Lady Island Seep Analysis																							
D1	Acid Ditch	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Acid Ditch	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	East Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	West Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs													PAHs							
OA	Sample ID	Sample Date	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Trichlorotrifluoroethane	m-Xylene & p-Xylene	o-Xylene	Styrene	Vinyl chloride	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)Pyrene	Benzo(b)Fluoranthene	Benzo(a,h,i)perylene	Benzo(k)Fluoranthene
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
2004 Oil Spill at Woodmill Demolition Site (a)																							
A1	Woodmill Creek	2/10/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																							
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																							
A1	B1	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.044**	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
A1	B2	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
A1	B3	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021
A1	B4	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
A1	B5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.069**	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																							
C3	Telpole-20181026	10/26/2018	NA	NA	NA	<2.0	NA	NA	NA	NA	NA	< 3.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1996 Lady Island Seep Analysis																							
D1	Acid Ditch	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Acid Ditch	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	East Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	West Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			PAHs											PCBs			
OA	Sample ID	Sample Date	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Total Naphthalene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaohthalene	PCBs	Bicarbonate (as CaCO3) (mg/L)	Biochemical Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
2004 Oil Spill at Woodmill Demolition Site (a)																	
A1	Woodmill Creek	2/10/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/11/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/12/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/13/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/16/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/17/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/18/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/19/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/20/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/23/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/24/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/25/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/26/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	2/27/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/1/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/2/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	Woodmill Creek	4/22/2004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2012 Black Liquor Release from No. 4 Swing Tank																	
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Black Liquor Basement Release																	
B1	B-1	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-2	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1	B-3	5/22/2012	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																	
A1	B1	10/8/2015	<0.021	<0.021	<0.021	**0.08**	<0.021	**1.463**	**0.028**	**0.041**	<0.021	**1.4**	**0.035**	NA	NA	NA	NA
A1	B2	10/8/2015	<0.020	<0.020	<0.020	<0.020	<0.020	**0.042**	**0.022**	<0.020	<0.020	<0.020	<0.020	NA	NA	NA	NA
A1	B3	10/8/2015	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.021	**0.063 / 0.102**	**0.043 / 0.078**	**0.021 / 0.029**	<0.020 / <0.021	<0.020 / <0.021	<0.020 / <0.027	NA	NA	NA	NA
A1	B4	10/8/2015	<0.021	<0.021	<0.021	<0.021	<0.021	**0.035**	<0.021	<0.021	<0.021	<0.021	<0.028	NA	NA	NA	NA
A1	B5	10/8/2015	<0.021	<0.021	<0.021	**0.07**	<0.021	**0.805**	**0.035**	**0.024**	<0.021	**0.49**	**0.28**	NA	NA	NA	NA
2018 Utility Pole Installation Petroleum Hydrocarbon Discovery																	
C3	Telpole-20181026	10/26/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1996 Lady Island Seep Analysis																	
D1	Acid Ditch	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Acid Ditch	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	8/15/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Clarifier Outlet	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	East Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	West Seep	9/30/1996	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

										TPH			Total Metals										
OA	Sample ID	Sample Date	pH	Temperature	Turbidity	Conductivity	Total Dissolved Solids	Total Organic Carbon	Oil & Grease	GRO	DRO	ORO	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc	Ammonia
	Units			°F	NTU	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
CBC Area Groundwater Data																								
F1	MW-1	8/25/2000	NA	NA	NA	NA	NA	NA	NA	<0.250	<0.630	<0.630	<1	**3.62**	<1	<1	NA	<1	<1.25	NA	<1	<1	NA	NA
F1	MW-1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-1	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	NA	NA	NA	NA	NA	**0.732**	<0.630	<0.630	**2.68**	**62.5**	<1	**3.44**	NA	**3.67**	<1.25	NA	<1	**1.33**	NA	NA
F1	MW-2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	NA	NA	NA	NA	NA	<0.250	<0.630	<0.630	<1	**7.77**	<1	<1	NA	<1	<1.25	NA	<1	<1	NA	NA
F1	MW-3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(GW)	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lady Island Landfill Permit Monitoring (b)																								
D1	NW 102	3/26/2020	6.69	55	NA	589	381	9.51	NA	NA	NA	NA	NA	**56.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.312**
D1	NW 102	5/26/2020	7.02	58	NA	592	1310	9.86	NA	NA	NA	NA	NA	**91.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.722**
D1	NW 102	7/28/2020	6.87	61	NA	815	419	9.09	NA	NA	NA	NA	NA	**76.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.587**
D1	NW 102	11/10/2020	6.74	57	NA	809	486	8.81	NA	NA	NA	NA	NA	**68.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.964**
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/17/2021	6.7	56	NA	365	340	9.96	NA	NA	NA	NA	NA	**69.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.536**
D1	NW 102	6/9/2021	8.52	61	NA	761	298	6.9	NA	NA	NA	NA	NA	**86.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.587**
D1	NW 102	9/14/2021	7.82	57	NA	653	1020	6.7	NA	NA	NA	NA	NA	**110**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.56**
D1	NW 102	12/8/2021	7.53	54	NA	404	294	6.5	NA	NA	NA	NA	NA	**69.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.442**
D1	NW 102	3/22/2022	7.47	59	NA	475	300	8.1	NA	NA	NA	NA	NA	**49.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.332**
D1	NW 102	6/15/2022	7.53	60	NA	808	322	9.2	NA	NA	NA	NA	NA	**28.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.562**
D1	NW 102	9/8/2022	7.78	66	NA	849	390	8.8	NA	NA	NA	NA	NA	**44.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.17**
D1	NW 102	11/28/2022	6.93	55	NA	720	326	8.40 J+	NA	NA	NA	NA	NA	**55.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.612**
D1	SW 107	3/26/2020	6.56	57	NA	1729	1110	17.3	NA	NA	NA	NA	NA	**260**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.34**
D1	SW 107	5/26/2020	6.65	57	NA	1641	397	16.4	NA	NA	NA	NA	NA	**28.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.29**
D1	SW 107	7/28/2020	6.55	63	NA	1964	1190	16.6	NA	NA	NA	NA	NA	**257**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.14**
D1	SW 107	11/10/2020	6.56	57	NA	1837	1180	15.5	NA	NA	NA	NA	NA	**250**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.51**
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/17/2021	6.63	63	NA	951	1080	16	NA	NA	NA	NA	NA	**328**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.39**
D1	SW 107	6/9/2021	7.31	61	NA	1883	1080	14.9	NA	NA	NA	NA	NA	**262**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.54**
D1	SW 107	9/14/2021	8.18	64	NA	1739	1130	14.2	NA	NA	NA	NA	NA	**273**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.95**
D1	SW 107	12/8/2021	7.03	53	NA	1329	1130	15.1	NA	NA	NA	NA	NA	**253**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.82**
D1	SW 107	3/22/2022	7.67	55	NA	1728	1100	15.7	NA	NA	NA	NA	NA	**321**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.72**
D1	SW 107	6/15/2022	7.56	60	NA	2013	1130	14.5	NA	NA	NA	NA	NA	**299**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.07**
D1	SW 107	9/8/2022	7.83	64	NA	2266	1140	14.8	NA	NA	NA	NA	NA	**282**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.1**
D1	SW 107	11/28/2022	6.83	55	NA	2176	1110	15	NA	NA	NA	NA	NA	**268**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.99**
D1	NE 201	3/26/2020	6.58	56	NA	989	975	22	NA	NA	NA	NA	NA	**80.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.84**
D1	NE 201	5/26/2020	6.83	58	NA	1006	900	18.8	NA	NA	NA	NA	NA	**34.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.13**
D1	NE 201	7/28/2020	6.64	60	NA	1340	946	20.1	NA	NA	NA	NA	NA	**71.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.35**
D1	NE 201	11/10/2020	6.64	56	NA	1219	998	21.7	NA	NA	NA	NA	NA	**63.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2**
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/17/2021	6.7	55	NA	545	1040	21.1	NA	NA	NA	NA	NA	**78**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.83**

Table B1: Data Summary Table - Groundwater

													VOCs									
OA	Sample ID	Sample Date	Boron	Calcium	Chloride	Iron	Magnesium	Manganese	Nitrate	Potassium	Sodium	Sulfate	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
		Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CBC Area Groundwater Data																						
F1	MW-1	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	<1.00	NA	NA	NA	NA
F1	MW-1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	**8.32**	<1.00	<1.00	<1.00	**4.54**	<1.00	<1.00	<1.00	<1.00
F1	MW-1	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.71**	NA	NA	NA	<1.00	NA	NA	NA	NA
F1	MW-2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
F1	MW-2	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	NA	NA	NA	<1.00	NA	NA	NA	NA
F1	MW-3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	<1.00	<1.00	<1.00	<1.00	**1.19**	<1.00	<1.00	<1.00	<1.00
F1	MW-3	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	**1.2**	NA	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.0	NA	NA	NA	<1.0	NA	NA	NA	NA
F1	MW-4	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
F1	MW-4	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	<1.00	NA	NA	NA	NA
F1	MW-5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
F1	MW-5	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA
F1	B-6(GW)	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
Lady Island Landfill Permit Monitoring (b)																						
D1	NW 102	3/26/2020	**0.035**	**55.2**	**13.8**	**15**	**30.5**	**4.17**	**0.1**	**2.01**	**20**	**1.98**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	5/26/2020	<0.021	**216**	**84.5**	<0.021	**123**	**9.25**	<0.1	**3.85**	**54**	**0.64**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	7/28/2020	**0.028**	**69**	**17.2**	**32.9**	**35.1**	**4.42**	**0.38**	**2.19**	**20.3**	**0.53**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/10/2020	**0.027**	**69**	**19.4**	**23**	**35.6**	**4.3**	<0.1	**2.15**	**20.3**	<0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/17/2021	**0.059**	**54.6**	**12.2**	**20**	**27.4**	**5.83**	<0.1	**2.26**	**17**	**1.47**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/9/2021	**0.06**	NA	**10.8**	**1.4**	**24.7**	**3.19**	<0.1	**2.37**	**15.6**	**2.29**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/14/2021	<0.021	NA	**21**	**34.2**	**38.5**	**4.16**	<0.1	**1.97**	**19.1**	**1.27**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/8/2021	**0.058**	NA	**12.1**	<0.021	**24.9**	**3.37**	<0.1	**2.23**	**17.5**	**1.54**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/22/2022	**0.0537**	**44.6**	**10.6**	**5.44**	**24.6**	**5.95**	<0.050	**1.82**	**17.4**	**3.01**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/15/2022	**0.0393**	**59.2**	**12.8**	**44.7**	**29.9**	**4.34**	<0.10	**1.91**	**20.2**	**2.66**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/8/2022	**0.0291 J**	**68.9**	**17**	**30.9**	**32.4**	**4.12**	<0.10	**1.77**	**18.6**	**0.22**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/28/2022	**0.0518**	**49.3**	**11.1**	**22.3**	**27.5**	**4.06**	<0.10	**1.86**	**17**	**4.26**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/26/2020	<0.021	**211**	**86.3**	**44**	**124**	**10.4**	<0.1	**4.12**	**57.5**	**0.51**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	5/26/2020	<0.021	**61.4**	**15.5**	<0.021	**32.5**	**4.21**	<0.1	**1.95**	**19.4**	**0.87**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	7/28/2020	<0.021	**221**	**83.6**	**41.4**	**116**	**10.1**	**1.04**	**4.1**	**53.1**	<0.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/10/2020	**0.024**	**219**	**86.4**	**42.4**	**113**	**9.58**	<0.1	**3.89**	**52.7**	**0.61**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/17/2021	<0.021	**203**	**80.6**	**27.1**	**106**	**8.49**	<0.1	**4.76**	**54.3**	**0.77**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/9/2021	<0.021	NA	**86.5**	**2.79**	**111**	**7.34**	<0.1	**4.61**	**45.9**	**1.44**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/14/2021	**0.163**	NA	**86.4**	**16**	**107**	**7.8**	<0.1	**4.15**	**40.4**	**4.12**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/8/2021	<0.021	NA	**86.8**	<0.021	**124**	**9.85**	<0.1	**4.21**	**40.3**	**2.09**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/22/2022	**0.0163**	**204**	**88.9**	**39.9**	**112**	**9.34**	<0.10	**3.61**	**35**	**0.48**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/15/2022	**0.0145 J+**	**187**	**94.5**	**1.54**	**105**	**7.01**	<0.10	**4.67**	**41.7**	**1.81**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/8/2022	**0.0165**	**220**	**88.5**	**3.69**	**106**	**6.92**	<0.10	**3.99**	**39.2**	**1.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/28/2022	**0.0301**	**200**	**81.3**	**39.2**	**110**	**8.83**	<0.10	**5**	**33.9**	**0.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/26/2020	<0.021	**128**	**7.28**	**70.4**	**55.6**	**5.28**	<0.1	**2.47**	**52.2**	**392**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	5/26/2020	<0.021	**127**	**7.28**	**3.06**	**53.3**	**4.77**	<0.1	**2.27**	**49.4**	**330**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	7/28/2020	**0.031**	**131**	**7.47**	**103**	**58.5**	**5.42**	**0.24**	**2.8**	**55.4**	**352**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/10/2020	**0.026**	**121**	**7.12**	**91.5**	**50**	**5.28**	<0.1	**2.74**	**50.5**	**403**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/17/2021	**0.022**	**131**	**7.26**	**91.6**	**53.1**	**5.76**	<0.1	**2.85**	**48.1**	**442**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chlorotoluene	2-Hexanone	4-isopropyltoluene	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CBC Area Groundwater Data																							
F1	MW-1	8/25/2000	NA	NA	**76.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA
F1	MW-1	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	<0.300	<1.00	<1.00	<1.00
F1	MW-1	3/18/2021	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA
F1	MW-2	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	<0.300	<1.00	<1.00	<1.00
F1	MW-2	3/18/2021	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA
F1	MW-3	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	<0.300	<1.00	<1.00	<1.00
F1	MW-3	3/18/2021	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	**8.46**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA
F1	MW-4	7/19/2016	<1.00	<1.00	**1.85**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	<0.300	<1.00	<1.00	<1.00
F1	MW-4	3/18/2021	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.00	NA	NA	NA
F1	MW-5	7/20/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	<0.300	<1.00	<1.00	<1.00
F1	MW-5	3/18/2021	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.50	NA	NA	NA
F1	B-6(GW)	7/20/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<10.0	<1.00	<10.0	<1.00	<1.00	<20.0	<50.0	<5.00	**0.4**	<1.00	<1.00	<1.00
Lady Island Landfill Permit Monitoring (b)																							
D1	NW 102	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	Bromoform	Bromomethane	Carbon Disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethylbenzene	Hexachlorobutadiene	Isopropylbenzene	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene
		Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CBC Area Groundwater Data																							
F1	MW-1	8/25/2000	NA	NA	NA	NA	**11.1**	NA	NA	NA	**2.39**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-1	7/19/2016	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<20.0	<1.00	<1.00	<1.00
F1	MW-1	3/18/2021	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	NA	NA	<1.0	NA	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	7/19/2016	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00
F1	MW-2	3/18/2021	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	NA	NA	<1.0	NA	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	7/19/2016	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<20.0	<1.00	<1.00	<1.00
F1	MW-3	3/18/2021	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	NA	NA	**3.36**	NA	NA	NA	<1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	7/19/2016	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<20.0	<1.00	<1.00	<1.00
F1	MW-4	3/18/2021	NA	NA	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	NA	NA	<1.00	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	7/20/2016	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<20.0	<1.00	<1.00	<1.00
F1	MW-5	3/18/2021	NA	NA	NA	NA	<0.50	NA	NA	NA	**0.51**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(GW)	7/20/2016	<1.00	<1.00	<2.00	<1.00	**3.84**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<20.0	<1.00	<1.00	<1.00
Lady Island Landfill Permit Monitoring (b)																							
D1	NW 102	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs													PAHs							
OA	Sample ID	Sample Date	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Trichlorotrifluoroethane	m-Xylene & p-Xylene	o-Xylene	Styrene	Vinyl chloride	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)Pyrene	Benzo(b)Fluoranthene	Benzo(a,h,i)perylene	Benzo(k)Fluoranthene
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
CBC Area Groundwater Data																							
F1	MW-1	8/25/2000	NA	NA	**23.6**	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-1	7/19/2016	<1.00	<1.00	**2**	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-1	3/18/2021	NA	NA	**0.94**	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	**2.32**	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	3/18/2021	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	<1.0	NA	NA	NA	**17.5**	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**6.23**	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	3/18/2021	NA	NA	<0.50	NA	NA	NA	**8.2**	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	<1.0	NA	NA	NA	<1.0	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	3/18/2021	NA	NA	<0.50	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	<1.00	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	7/20/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	**1.25**	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	3/18/2021	NA	NA	<0.50	NA	NA	NA	**1.2**	NA	NA	NA	NA	NA	<0.50	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(GW)	7/20/2016	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	<1.00	NA	NA	NA	NA	NA	NA	NA	NA
Lady Island Landfill Permit Monitoring (b)																							
D1	NW 102	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NW 102	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SW 107	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			PAHs											PCBs			
OA	Sample ID	Sample Date	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Total Naphthalene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaohthalene	PCBs	Bicarbonate (as CaCO3) (mg/L)	Biochemical Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
CBC Area Groundwater Data																	
F1	MW-1	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	NA	NA	NA
F1	MW-1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-1	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	NA	NA	NA
F1	MW-2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-2	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	8/25/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	NA	NA	NA
F1	MW-3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-3	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-4	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	11/10/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	MW-5	3/18/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(GW)	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lady Island Landfill Permit Monitoring (b)																	
D1	NW 102	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**279**	<4	**27**
D1	NW 102	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**298**	<4	**28**
D1	NW 102	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**318**	<4	**24**
D1	NW 102	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**363**	NA	**24**
D1	NW 102	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	NA
D1	NW 102	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**275**	<30	**28**
D1	NW 102	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**250**	NA	NA
D1	NW 102	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**403**	NA	NA
D1	NW 102	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**254**	NA	NA
D1	NW 102	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**241**	NA	NA
D1	NW 102	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**246**	NA	NA
D1	NW 102	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**472 J**	NA	NA
D1	NW 102	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**264**	NA	NA
D1	SW 107	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1040**	<4	**48**
D1	SW 107	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1040**	<4	**44**
D1	SW 107	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1060**	<4	**43**
D1	SW 107	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1040**	NA	**46**
D1	SW 107	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	NA
D1	SW 107	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1010**	<30	**41**
D1	SW 107	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**990**	NA	NA
D1	SW 107	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1000**	NA	NA
D1	SW 107	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1050**	NA	NA
D1	SW 107	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1020**	NA	NA
D1	SW 107	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**918**	NA	NA
D1	SW 107	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**988**	NA	NA
D1	SW 107	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**983**	NA	NA
D1	NE 201	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**259**	**5.2**	**60**
D1	NE 201	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**272**	<4	**48**
D1	NE 201	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**249**	**4.3**	**62**
D1	NE 201	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**228**	NA	**65**
D1	NE 201	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**6.6**	NA
D1	NE 201	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**216**	<30	**63**

Table B1: Data Summary Table - Groundwater

										TPH			Total Metals										
OA	Sample ID	Sample Date	pH	Temperature	Turbidity	Conductivity	Total Dissolved Solids	Total Organic Carbon	Oil & Grease	GRO	DRO	ORO	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc	Ammonia
	Units			°F	NTU	umhos/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
Lady Island Landfill Permit Monitoring (b)																								
D1	NE 201	6/9/2021	8.01	60	NA	1377	793	18	NA	NA	NA	NA	NA	**45.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.56**
D1	NE 201	9/14/2021	7.28	58	NA	1009	1030	19.2	NA	NA	NA	NA	NA	**66.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.14**
D1	NE 201	12/8/2021	7.56	52	NA	914	802	19.8	NA	NA	NA	NA	NA	**37.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.17**
D1	NE 201	3/22/2022	7.42	59	NA	1179	926	20.2	NA	NA	NA	NA	NA	**109**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.2**
D1	NE 201	6/15/2022	7.1	55	NA	945	3810	13.6	NA	NA	NA	NA	NA	**105**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**5.64**
D1	NE 201	9/8/2022	7.27	66	NA	923	931	20.4	NA	NA	NA	NA	NA	**61.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.38**
D1	NE 201	11/28/2022	6.85	53	NA	1330	787	20	NA	NA	NA	NA	NA	**61.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.09**
D1	E 202	3/26/2020	6.75	56	NA	650	494	16.5	NA	NA	NA	NA	NA	**104**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.62**
D1	E 202	5/26/2020	6.7	59	NA	697	574	19.7	NA	NA	NA	NA	NA	**24.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.81**
D1	E 202	7/28/2020	6.71	64	NA	960	586	19.4	NA	NA	NA	NA	NA	**101**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.63**
D1	E 202	11/10/2020	6.67	59	NA	898	608	24	NA	NA	NA	NA	NA	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.2**
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/16/2021	6.79	56	NA	523	549	19.4	NA	NA	NA	NA	NA	**91.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.05**
D1	E 202	6/9/2021	8.01	61	NA	963	636	17.7	NA	NA	NA	NA	NA	**108**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.37**
D1	E 202	9/14/2021	7.18	64	NA	719	632	16.7	NA	NA	NA	NA	NA	**118**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.34**
D1	E 202	12/8/2021	8.59	55	NA	615	587	21.8	NA	NA	NA	NA	NA	**77**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.44**
D1	E 202	3/22/2022	7.41	53	NA	860	633	14.6	NA	NA	NA	NA	NA	**135**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.4**
D1	E 202	6/15/2022	7.53	60	NA	1223	760	11.7	NA	NA	NA	NA	NA	**172**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.66**
D1	E 202	9/8/2022	7.78	63	NA	1141	686	12.1	NA	NA	NA	NA	NA	**150**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.59**
D1	E 202	11/28/2022	6.95	58	NA	1069	671	12.3	NA	NA	NA	NA	NA	**159**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.64**
D1	SE 203	3/26/2020	6.74	53	NA	980	901	74	NA	NA	NA	NA	NA	**98.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	5/26/2020	6.81	56	NA	688	595	2.1	NA	NA	NA	NA	NA	**57.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	7/28/2020	6.67	58	NA	952	731	41.6	NA	NA	NA	NA	NA	**76.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	11/10/2020	6.62	62	NA	498	316	7.75	NA	NA	NA	NA	NA	**41.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/17/2021	6.43	52	NA	462	694	45.3	NA	NA	NA	NA	NA	**68.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	6/9/2021	8.02	60	NA	973	663	53.5	NA	NA	NA	NA	NA	**58.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	9/14/2021	7.5	61	NA	491	632	34	NA	NA	NA	NA	NA	**53**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.06**
D1	SE 203	12/8/2021	8.18	53	NA	926	1010	30.5	NA	NA	NA	NA	NA	**116**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
D1	SE 203	3/22/2022	6.74	53	NA	866	1490	59.6	NA	NA	NA	NA	NA	**204**	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.050
D1	SE 203	6/15/2022	7.85	58	NA	1914	1120	40.5	NA	NA	NA	NA	NA	**199**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.077**
D1	SE 203	9/8/2022	7.64	60	NA	1789	1100	44	NA	NA	NA	NA	NA	**148**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.058**
D1	SE 203	11/28/2022	6.98	54	NA	948	602	32.6	NA	NA	NA	NA	NA	**106**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.072**

Notes:

(a) Woodmill Creek is an uncontrolled stream with intermittent flow that contains urban stormwater and groundwater from the south side of Tidland Heights (estimated drainage area 14.5 acres).

(b) The most recent three years of monitoring data for the existing Lady Island Landfill (LILF) monitoring wells are provided in this table. Additional data is available in the LILF Groundwater Monitoring Reports.

Table B1: Data Summary Table - Groundwater

													VOCs									
OA	Sample ID	Sample Date	Boron	Calcium	Chloride	Iron	Magnesium	Manganese	Nitrate	Potassium	Sodium	Sulfate	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene
	Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lady Island Landfill Permit Monitoring (b)																						
D1	NE 201	6/9/2021	<0.021	NA	**7.2**	**41.6**	**50.3**	**4.98**	**1.71**	**2.62**	**46.2**	**316**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/14/2021	<0.021	NA	**6.49**	**118**	**53**	**5.97**	<0.1	**2.74**	**48**	**389**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/8/2021	<0.021	NA	**5.95**	**0.026**	**47.8**	**4.84**	<0.1	**2.6**	**48.4**	**318**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/22/2022	**0.022**	**121**	**7.11**	**100**	**50.2**	**5.53**	<0.10	**2.51**	**44.6**	**463**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	6/15/2022	**0.0381**	**230**	**6.67**	**553**	**105**	**16.1**	<0.10	**6.27**	**68.5**	**2240**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/8/2022	**0.0236**	**132**	**6.59**	**86.6**	**48.4**	**4.89**	<0.10	**2.39**	**44.5**	**370**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/28/2022	**0.0187**	**109**	**5.8**	**80.4**	**48.5**	**4.75**	<0.10	**2.35**	**42.8**	**303**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/26/2020	**0.061**	**81.7**	**4.85**	**17.2**	**23.2**	**3.68**	<0.1	**2.47**	**37.6**	**33.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	5/26/2020	**0.06**	**90.5**	**5.02**	**2.57**	**24.5**	**3.84**	**0.12**	**2.09**	**35.7**	**53.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	7/28/2020	**0.073**	**97.7**	**5.93**	**27.5**	**27.4**	**4.24**	**0.3**	**2.55**	**40.9**	**50.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/10/2020	**0.079**	**100**	**6.42**	**29.3**	**26.4**	**4.57**	<0.1	**2.54**	**40.5**	**35.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/16/2021	**0.08**	**101**	**5.54**	**27.3**	**26.5**	**4.61**	<0.1	**2.65**	**34.5**	**54.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/9/2021	**0.061**	NA	**6.5**	**26.2**	**29.3**	**4.86**	**0.17**	**2.44**	**34.7**	**79.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/14/2021	**0.068**	NA	**6.95**	**26.8**	**30.3**	**5.08**	**0.15**	**2.76**	**38.4**	**71.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/8/2021	**0.08**	NA	**6.91**	**9.88**	**29.5**	**4.98**	**0.17**	**2.8**	**40**	**23.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/22/2022	**0.0617**	**109**	**6.52**	**25.7**	**29.5**	**5.28**	<0.10	**2.52**	**38.1**	**118**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/15/2022	**0.0951**	**128**	**8.28**	**7.46**	**36**	**5.22**	<0.10	**4.11**	**44.7**	**195**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/8/2022	**0.0727**	**133**	**6.85**	**1.69**	**31.6**	**4.69**	<0.10	**2.76**	**44.6**	**152**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/28/2022	**0.0668**	**120**	**6.7**	**23.4**	**35.7**	**5.56**	**1.1**	**2.79**	**45.2**	**146**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/26/2020	**0.156**	**158**	**48.8**	**0.041**	**50.3**	**0.521**	**3.19**	**14.7**	**24.6**	**149**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	5/26/2020	**0.126**	**110**	**32.8**	<0.021	**32.8**	**0.0589**	**2.62**	**12.4**	**15.7**	**69.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	7/28/2020	**0.146**	**136**	**32.4**	**0.05**	**42.4**	**0.488**	**0.4**	**14.5**	**27.2**	**77.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/10/2020	**0.089**	**59.7**	**4.37**	<0.021	**17.5**	**0.0084**	**4.6**	**11.8**	**10.4**	**14**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/17/2021	**0.112**	**114**	**34.3**	**0.032**	**33.1**	**0.191**	**6.5**	**13.9**	**17.1**	**116**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/9/2021	**0.15**	NA	**37.3**	**0.03**	**32.4**	**0.0734**	**0.19**	**14.1**	**15.6**	**120**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/14/2021	**0.128**	NA	**30.8**	**0.062**	**33.7**	**0.176**	<0.1	**12**	**20**	**85.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/8/2021	**0.174**	NA	**69**	<0.021	**50.7**	**0.0671**	**21.7**	**19.1**	**19.3**	**226**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/22/2022	**1.11**	**301**	**70.5**	**2.84 J**	**74.5**	**1.49 J**	**2.1**	**27.2**	**65.7**	**43**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/15/2022	**0.644**	**217**	**43.7**	**0.163**	**68.5**	**3.2**	<0.10	**21.6**	**56.5**	**20.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/8/2022	**0.775**	**232**	**42.4**	**0.0377 J+**	**59.9**	**4.09**	<0.10	**19.2**	**56.4**	**42.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/28/2022	**0.17**	**112**	**24.2**	**1.69**	**29.8**	**0.747**	**5.7**	**17.1**	**18.9**	**95.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone	2-Chlorotoluene	2-Hexanone	4-isopropyltoluene	4-Chlorotoluene	4-Methyl-2-pentanone	Acetone	Acrylonitrile	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lady Island Landfill Permit Monitoring (b)																							
D1	NE 201	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/16/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs																			
OA	Sample ID	Sample Date	Bromoform	Bromomethane	Carbon Disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethylbenzene	Hexachlorobutadiene	Isopropylbenzene	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lady Island Landfill Permit Monitoring (b)																							
D1	NE 201	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/16/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			VOCs													PAHs							
OA	Sample ID	Sample Date	sec-Butylbenzene	tert-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Trichlorotrifluoroethane	m-Xylene & p-Xylene	o-Xylene	Styrene	Vinyl chloride	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)Pyrene	Benzo(b)Fluoranthene	Benzo(a,h,i)perylene	Benzo(k)Fluoranthene
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Lady Island Landfill Permit Monitoring (b)																							
D1	NE 201	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NE 201	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/16/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	E 202	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SE 203	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B1: Data Summary Table - Groundwater

			PAHs											PCBs			
OA	Sample ID	Sample Date	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Total Naphthalene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaohthalene	PCBs	Bicarbonate (as CaCO3) (mg/L)	Biochemical Oxygen Demand (mg/L)	Chemical Oxygen Demand (mg/L)
	Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L
Lady Island Landfill Permit Monitoring (b)																	
D1	NE 201	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**251**	NA	NA
D1	NE 201	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**236**	NA	NA
D1	NE 201	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**300**	NA	NA
D1	NE 201	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**276**	NA	NA
D1	NE 201	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**84.3**	NA	NA
D1	NE 201	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**245**	NA	NA
D1	NE 201	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**253**	NA	NA
D1	E 202	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**348**	<4	**51**
D1	E 202	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**355**	<4	**59**
D1	E 202	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**376**	<4	**57**
D1	E 202	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**405**	NA	**69**
D1	E 202	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**10.4**	NA
D1	E 202	3/16/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**405**	<30	**53**
D1	E 202	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**402**	NA	NA
D1	E 202	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**418**	NA	NA
D1	E 202	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**455**	NA	NA
D1	E 202	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**409**	NA	NA
D1	E 202	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**379**	NA	NA
D1	E 202	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**370**	NA	NA
D1	E 202	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**395**	NA	NA
D1	SE 203	3/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**392**	<4	**209**
D1	SE 203	5/26/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**299**	<4	**110**
D1	SE 203	7/28/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**398**	<4	**99**
D1	SE 203	11/10/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**214**	NA	**22**
D1	SE 203	12/17/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4	NA
D1	SE 203	3/17/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**262**	<30	**46**
D1	SE 203	6/9/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**278**	NA	NA
D1	SE 203	9/14/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**338**	NA	NA
D1	SE 203	12/8/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**264**	NA	NA
D1	SE 203	3/22/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1210**	NA	NA
D1	SE 203	6/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**902**	NA	NA
D1	SE 203	9/8/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**848**	NA	NA
D1	SE 203	11/28/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**306**	NA	NA

Table B2: Data Summary Table - Soil

								TPH			Extractable Petroleum Hydrocarbons (EPH) by Method NWTPH/EPH							
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Total Solids	Percent Solids	Percent Moisture	GRO	DRO	ORO	C10-C12 Aromatics	C12-C16 Aromatics	C16-C21 Aromatics	C21-C34 Aromatics	C10-C12 Aliphatics	C12-C16 Aliphatics	C16-C21 Aliphatics	C21-C34 Aliphatics
			ft bgs	Units	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																		
E1	service station soil (sidewall)	grab	NA	8/14/1992	82.90	NA	NA	< 5	**16**	**126**	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	< 5	< 25	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																		
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	6.8	**46**	**110**	**25 H**	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	NA	NA	18	**420**	**2500**	**19**	<60	<60	<60	**120**	<60	<60	**96**	**610**
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	4.5	<26	<51	<8	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	16	**130**	**740**	<7.8	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	16	**0.35**	**0.25**	<0.050	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																		
F1	GP1	soil boring	2.5	8/1/2000	NA	83	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP2B	soil boring	7.5	8/2/2000	NA	87.9	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP3	soil boring	14	8/1/2000	NA	77.4	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP4	soil boring	19	8/1/2000	NA	75.6	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP5	soil boring	4.5	8/1/2000	NA	87.1	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	73.9	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	89.8	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	75.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	NA	74.8	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	27.5	8/1/2000	NA	83	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP10	soil boring	21.5	8/1/2000	NA	65.6	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP11	soil boring	10.5	8/1/2000	NA	82.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	NA	77.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	NA	88.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP14	soil boring	8	8/2/2000	NA	81.9	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP15	soil boring	7.5	8/2/2000	NA	80.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP16	soil boring	2.7	8/3/2000	NA	87.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP17	soil boring	6	8/2/2000	NA	70.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP17C	soil boring	11.5	8/2/2000	NA	79.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP18	soil boring	1.5	8/3/2000	NA	84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP19	soil boring	1.5	8/3/2000	NA	87.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP20	soil boring	5.5	8/3/2000	NA	77.5	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					Volatile Petroleum Hydrocarbons (VPH) by Method NWTPH/VPH							Total Metals										
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	C10-C12 Aliphatics	C5-C6 Aliphatics	C6-C8 Aliphatics	C8-C10 Aliphatics	Total VPH	C10-C12 Aromatics	C8-C10 Aromatics	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																						
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																						
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	<24	<24	<24	<24	<170	<24	<24	NA	NA	NA	NA	NA	**12**	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																						
F1	GP1	soil boring	2.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**5.2**	**145**	**0.542**	**20.7**	NA	<10.0	<0.1	NA	<1	**0.988**	NA
F1	GP2B	soil boring	7.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	**1.29**	**143**	<0.5	**23**	NA	<10	<0.1	NA	<1	**0.637**	NA
F1	GP3	soil boring	14	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**6.46**	**114**	<0.5	**24.8**	NA	**14.5**	<0.1	NA	<1	**0.588**	NA
F1	GP4	soil boring	19	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**5.76**	**155**	<0.5	**48.3**	NA	**17.7**	<0.1	NA	<1	**0.939**	NA
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**1.32**	**91.9**	<0.5	**4.54**	NA	<10	<0.1	NA	<1	**1.37**	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**5.46**	**126**	<0.5	**29.4**	NA	**12.5**	<0.1	NA	<1	**0.921**	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**0.629**	**53**	<0.5	**3.01**	NA	<10.0	**0.442**	NA	<1	**0.824**	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**1.3**	**104**	<0.5	**88.3**	NA	**10.4**	<0.1	NA	<1	**0.769**	NA
F1	GP9	soil boring	27.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	**0.687**	**74.1**	<0.5	**59**	NA	**11.9**	<0.1	NA	<1	**0.874**	NA
F1	GP10	soil boring	21.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	<0.5	**120**	<0.5	**116**	NA	<10.0	<0.1	NA	<1	**1.06**	NA
F1	GP11	soil boring	10.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP14	soil boring	8	8/2/2000	NA	NA	NA	NA	NA	NA	NA	<0.5	**41.8**	<0.5	**1.4**	NA	<10.0	<0.1	NA	<1	<0.5	NA
F1	GP15	soil boring	7.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP16	soil boring	2.7	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP17	soil boring	6	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP17C	soil boring	11.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP18	soil boring	1.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	**4.04**	**499**	**1.73**	**19.3**	NA	**25.6**	**0.676**	NA	<1	**0.56**	NA
F1	GP19	soil boring	1.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	**4.41**	**99.5**	**1.54**	**23.6**	NA	**29.6**	**0.194**	NA	<1	**0.737**	NA
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					VOCs																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																					
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																					
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	<0.001 H	<0.0021 H	<0.0041 H	<0.0021 H	<0.001 H	<0.0052 H	<0.0021 H	<0.0031 H	<0.0021 H	<0.0021 H	<0.0021 H	<0.01 H	<0.001 H	<0.0021 H	<0.001 H	<0.0021 H	<0.0052 H	<0.0021 H
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																					
F1	GP1	soil boring	2.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP2B	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP3	soil boring	14	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP4	soil boring	19	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP9	soil boring	27.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP10	soil boring	21.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP11	soil boring	10.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP12	soil boring	14.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP13	soil boring	6.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP14	soil boring	8	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP15	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP16	soil boring	2.7	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP17	soil boring	6	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	**50.1**	<0.1	<0.1	<0.1	<0.1
F1	GP17C	soil boring	11.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	**0.382**	<0.1	<0.1	<0.1	<0.1
F1	GP18	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP19	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114
F1	B-1(13')	soil boring	13	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128
F1	B-1(26')	soil boring	26	7/19/2016	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164
F1	B-1B(28')	soil boring	28	7/20/2016	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147
F1	B-2(2')	soil boring	2	7/19/2016	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139
F1	B-2(40')	soil boring	40	7/19/2016	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103
F1	B-3(1')	soil boring	1	7/19/2016	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168
F1	B-3B(10')	soil boring	10	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134
F1	B-4(2')	soil boring	2	7/19/2016	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125
F1	B-4(12')	soil boring	12	7/19/2016	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129
F1	B-4(37')	soil boring	37	7/19/2016	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140
F1	B-5(3')	soil boring	3	7/19/2016	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130
F1	B-5(10')	soil boring	10	7/19/2016	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333
F1	B-5B(1')	soil boring	1	7/20/2016	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169
F1	B-5B(6')	soil boring	6	7/20/2016	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135
F1	B-6(31')	soil boring	31	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134
F1	B-7A(1')	soil boring	1	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128
F1	B-7A(5')	soil boring	5	7/19/2016	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271

Table B2: Data Summary Table - Soil

					VOCs																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Isopropyltoluene	4-Methyl-2-pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	2-Butanone	n-Butylbenzene	Carbon disulfide
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																						
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																						
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	<0.0021 H	<0.001 H	<0.0052 H	<0.0021 H	NA	<0.0021 H	<0.0021 H	NA	NA	<0.0021 H	<0.01 H	<0.0021 H	<0.001 H	<0.0021 H	<0.001 H	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																						
F1	GP1	soil boring	2.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP2B	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP3	soil boring	14	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP4	soil boring	19	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP9	soil boring	27.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP10	soil boring	21.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP11	soil boring	10.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP12	soil boring	14.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP13	soil boring	6.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP14	soil boring	8	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP15	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP16	soil boring	2.7	8/3/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP17	soil boring	6	8/2/2000	<0.1	**1.1**	<0.1	<0.1	<1.0	<0.1	NA	<0.5	**5.13**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP17C	soil boring	11.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP18	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP19	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<1.0	<0.1	NA	<0.5	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<1.0	<0.5	<1.0
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA		NA	NA		NA	NA	NA	NA	NA	NA	NA			
F1	B-1(1')	soil boring	1	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0228	<0.0114	<0.0114	<0.0456	<0.114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0456	<0.0114	<0.0114
F1	B-1(13')	soil boring	13	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0256	<0.0128	<0.0128	<0.0511	<0.128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0511	<0.0128	<0.0128
F1	B-1(26')	soil boring	26	7/19/2016	<0.0164	<0.0164	<0.0164	<0.0164	<0.0327	<0.0164	<0.0164	<0.0655	<0.164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0655	<0.0164	<0.0164
F1	B-1B(28')	soil boring	28	7/20/2016	<0.0147	<0.0147	<0.0147	<0.0147	<0.0294	<0.0147	<0.0147	<0.0588	<0.147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0588	<0.0147	<0.0147
F1	B-2(2')	soil boring	2	7/19/2016	<0.0139	<0.0139	<0.0139	<0.0139	<0.0278	<0.0139	<0.0139	<0.0557	<0.139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0557	<0.0139	<0.0139
F1	B-2(40')	soil boring	40	7/19/2016	<0.0103	<0.0103	<0.0103	<0.0103	<0.0207	<0.0103	<0.0103	<0.0414	<0.103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0414	<0.0103	<0.0103
F1	B-3(1')	soil boring	1	7/19/2016	<0.0168	<0.0168	<0.0168	<0.0168	<0.0336	<0.0168	<0.0168	<0.0673	<0.168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0673	<0.0168	<0.0168
F1	B-3B(10')	soil boring	10	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0268	<0.0134	<0.0134	<0.0536	<0.134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0536	<0.0134	<0.0134
F1	B-4(2')	soil boring	2	7/19/2016	<0.0125	<0.0125	<0.0125	<0.0125	<0.0251	<0.0125	<0.0125	<0.0502	<0.125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0502	<0.0125	<0.0125
F1	B-4(12')	soil boring	12	7/19/2016	<0.0129	<0.0129	<0.0129	<0.0129	<0.0259	<0.0129	<0.0129	<0.0517	<0.129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0517	<0.0129	<0.0129
F1	B-4(37')	soil boring	37	7/19/2016	<0.0140	<0.0140	<0.0140	<0.0140	<0.0279	<0.0140	<0.0140	<0.0559	<0.140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0559	<0.0140	<0.0140
F1	B-5(3')	soil boring	3	7/19/2016	<0.0130	<0.0130	<0.0130	<0.0130	<0.026	<0.0130	<0.0130	<0.0519	<0.130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0519	<0.0130	<0.0130
F1	B-5(10')	soil boring	10	7/19/2016	<0.0333	<0.0333	<0.0333	<0.0333	<0.0665	<0.0333	<0.0333	<0.133	<0.333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.133	<0.0333	<0.0333
F1	B-5B(1')	soil boring	1	7/20/2016	<0.0169	<0.0169	<0.0169	<0.0169	<0.0338	<0.0169	<0.0169	<0.0677	<0.169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0677	<0.0169	<0.0169
F1	B-5B(6')	soil boring	6	7/20/2016	<0.0135	<0.0135	<0.0135	<0.0135	<0.0269	<0.0135	<0.0135	<0.0539	<0.135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0539	<0.0135	<0.0135
F1	B-6(31')	soil boring	31	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0267	<0.0134	<0.0134	<0.0534	<0.134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134
F1	B-7A(1')	soil boring	1	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0255	<0.0128	<0.0128	<0.051	<0.128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.051	<0.0128	<0.0128
F1	B-7A(5')	soil boring	5	7/19/2016	<0.0271	<0.0271	<0.0271	<0.0271	<0.0543	<0.0271	<0.0271	<0.109	<0.271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.109	<0.0271	<0.0271

Table B2: Data Summary Table - Soil

					VOCs																	
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethyl benzene	Hexachlorobutadiene	Isopropyl benzene	Methyl tert-butyl	Methylene Chloride	m-Xylene & P-Xylene	Naphthalene	n-Butylbenzene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																						
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	<0.1	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																						
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	<0.0021 H	<0.0021 H	<0.0021 H	<0.0021 H	<0.001 H	<0.0021 H	<0.001 H	<0.0021 H	<0.001 H	<0.0021 H	<0.0021 H	<0.0031 H	<0.0021 H	<0.0021 H	<0.016 H	<0.0021 H	<0.01 H	<0.0021 H
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																						
F1	GP1	soil boring	2.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP2B	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP3	soil boring	14	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP4	soil boring	19	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP9	soil boring	27.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP10	soil boring	21.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP11	soil boring	10.5	8/1/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP12	soil boring	14.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP13	soil boring	6.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP14	soil boring	8	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP15	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP16	soil boring	2.7	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP17	soil boring	6	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	**0.75**	<0.2	<0.2	NA
F1	GP17C	soil boring	11.5	8/2/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP18	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP19	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	<0.2	<0.2	<0.1	<0.5	<0.2	<0.2	NA
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0569	<0.0228	<0.0114	<0.0114
F1	B-1(13')	soil boring	13	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0639	<0.0256	<0.0128	<0.0128
F1	B-1(26')	soil boring	26	7/19/2016	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0818	<0.0327	<0.0164	<0.0164
F1	B-1B(28')	soil boring	28	7/20/2016	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0734	<0.0294	<0.0147	<0.0147
F1	B-2(2')	soil boring	2	7/19/2016	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0696	<0.0278	<0.0139	<0.0139
F1	B-2(40')	soil boring	40	7/19/2016	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0517	<0.0207	<0.0103	<0.0103
F1	B-3(1')	soil boring	1	7/19/2016	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0841	<0.0336	<0.0168	<0.0168
F1	B-3B(10')	soil boring	10	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0670	<0.0268	<0.0134	<0.0134
F1	B-4(2')	soil boring	2	7/19/2016	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0627	<0.0251	<0.0125	<0.0125
F1	B-4(12')	soil boring	12	7/19/2016	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0646	<0.0259	<0.0129	<0.0129
F1	B-4(37')	soil boring	37	7/19/2016	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0699	<0.0279	<0.0140	<0.0140
F1	B-5(3')	soil boring	3	7/19/2016	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0649	<0.026	<0.0130	<0.0130
F1	B-5(10')	soil boring	10	7/19/2016	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0649	<0.0665	<0.0333	<0.0333
F1	B-5B(1')	soil boring	1	7/20/2016	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0846	<0.0338	<0.0169	<0.0169
F1	B-5B(6')	soil boring	6	7/20/2016	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0673	<0.0269	<0.0135	<0.0135
F1	B-6(31')	soil boring	31	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0668	<0.0267	<0.0134	<0.0134
F1	B-7A(1')	soil boring	1	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0638	<0.0255	<0.0128	<0.0128
F1	B-7A(5')	soil boring	5	7/19/2016	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.136	<0.0543	<0.0271	<0.0271

Table B2: Data Summary Table - Soil

					VOCs													SVOCs				
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	N-Propyl benzene	o-Xylene	p-Isopropyl benzene	sec-Butylbenzene	Styrene	t-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Acenaphthene	Acenaphthylene	Aniline	Anthracene	Benzo(a)anthracene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																						
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	<0.1	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																						
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	<0.0021 H	<0.0021 H	NA	<0.0021 H	<0.0021 H	<0.0021 H	<0.0021 H	<0.0021 H	<0.0021 H	<0.01 H	<0.0021 H	<0.0021 H	<0.0021 H	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																						
F1	GP1	soil boring	2.5	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP2B	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP3	soil boring	14	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP4	soil boring	19	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.65	<1.65	NA	<1.65	<1.65
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	**2.95**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP9	soil boring	27.5	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP10	soil boring	21.5	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	**0.25**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP11	soil boring	10.5	8/1/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	NA
F1	GP14	soil boring	8	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	NA	NA	NA	NA
F1	GP15	soil boring	7.5	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP16	soil boring	2.7	8/3/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA	NA	NA	NA	NA
F1	GP17	soil boring	6	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<13.2	<13.2	NA	<13.2	<13.2
F1	GP17C	soil boring	11.5	8/2/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP18	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.33	<0.33	NA	<0.33	<0.33
F1	GP19	soil boring	1.5	8/3/2000	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.65	<1.65	NA	<1.65	<1.65
F1	GP20	soil boring	5.5	8/3/2000	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	<0.0164	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	<0.0147	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	<0.0139	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	<0.0103	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	<0.0168	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	<0.0125	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	<0.0129	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	<0.0140	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	<0.0130	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	<0.0333	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	<0.0169	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	<0.0135	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	<0.0134	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	<0.0128	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	<0.0271	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzoic Acid	Benzyl Alcohol	4-Bromophenyl phenyl ether	Butyl benzyl phthalate	4-Chloro-3-methylphenol	4-Chloroaniline	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl) ether	2-Chloronaphthalene	2-Chlorophenol	4-Chlorophenyl phenyl ether	Chrysene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																					
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																					
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																					
F1	GP1	soil boring	2.5	8/1/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP2B	soil boring	7.5	8/2/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP3	soil boring	14	8/1/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP4	soil boring	19	8/1/2000	<1.65	<1.65	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65	<1.65	<10.0	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	NA	NA	NA	NA	<0.33	NA	NA
F1	GP9	soil boring	12	8/1/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP9	soil boring	27.5	8/1/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP10	soil boring	21.5	8/1/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP11	soil boring	10.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	NA	NA	NA	NA	NA	<0.66	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	NA	NA	NA	NA	<0.33	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	NA	NA	NA	NA	NA	<0.66	NA	NA
F1	GP14	soil boring	8	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	NA	NA	NA	NA	<0.33	NA	NA
F1	GP15	soil boring	7.5	8/2/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP16	soil boring	2.7	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	NA	NA	NA	NA	<0.33	NA	NA
F1	GP17	soil boring	6	8/2/2000	<13.2	<13.2	<13.2	<13.2	<40.0	<13.2	<13.2	<13.2	<13.2	<80.0	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2
F1	GP17C	soil boring	11.5	8/2/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP18	soil boring	1.5	8/3/2000	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<2.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
F1	GP19	soil boring	1.5	8/3/2000	<1.65	<1.65	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65	<1.65	<10.0	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenz(a,h)anthracene	Dibenzofuran	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	3,3-Dichlorobenzidine	2,4-Dichlorophenol	Diethyl phthalate	2,4-Dimethylphenol	Dimethyl phthalate	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	Bis(2-ethylhexyl) phthalate
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																					
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																					
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																					
F1	GP1	soil boring	2.5	8/1/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP2B	soil boring	7.5	8/2/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP3	soil boring	14	8/1/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP4	soil boring	19	8/1/2000	<5.00	<1.65	<1.65	<1.65	<5.00	<5.00	<5.00	<5.00	<1.65	<1.65	<5.00	<1.65	<5.00	<10.0	<2.50	<2.50	<10.0
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	<1.00	NA	<1.00	<2.00	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP9	soil boring	27.5	8/1/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP10	soil boring	21.5	8/1/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP11	soil boring	10.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	NA	<2.00	NA	<2.00	<4.00	NA	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	<1.00	NA	<1.00	<2.00	NA	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	NA	<2.00	NA	<2.00	<4.00	NA	NA	NA
F1	GP14	soil boring	8	8/2/2000	NA	NA	NA	NA	NA	NA	<1.00	NA	<0.33	NA	<1.00	NA	<1.00	<2.00	<0.50	NA	NA
F1	GP15	soil boring	7.5	8/2/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP16	soil boring	2.7	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	NA	<1.00	NA	<1.00	<2.00	NA	NA	NA
F1	GP17	soil boring	6	8/2/2000	<40.0	<13.2	<13.2	<13.2	**946**	<40.0	<40.0	<40.0	<13.2	<13.2	<40.0	<13.2	<40.0	<80.0	<20.0	<20.0	<80.0
F1	GP17C	soil boring	11.5	8/2/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP18	soil boring	1.5	8/3/2000	<1.00	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<1.00	<0.33	<0.33	<1.00	<0.33	<1.00	<2.00	<0.50	<0.50	<2.00
F1	GP19	soil boring	1.5	8/3/2000	<5.00	<1.65	<1.65	<1.65	<5.00	<5.00	<5.00	<5.00	<1.65	<1.65	<5.00	<1.65	<5.00	<10.0	<2.50	<2.50	<10.0
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.037
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0399
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0454
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0435
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0371
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0401
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0415
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0412
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0437
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0422
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	2-Methylnaphthalene	2-Methylphenol	3-,4-Methylphenol	Naphthalene	2-Nitroaniline	3-Nitroaniline	4-Nitroaniline	Nitrobenzene	2-Nitrophenol
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																					
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																					
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																					
F1	GP1	soil boring	2.5	8/1/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP2B	soil boring	7.5	8/2/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP3	soil boring	14	8/1/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP4	soil boring	19	8/1/2000	<1.65	<1.65	<1.65	<5.00	<5.00	<5.00	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	<1.00
F1	GP9	soil boring	12	8/1/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP9	soil boring	27.5	8/1/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP10	soil boring	21.5	8/1/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP11	soil boring	10.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	<0.66	NA	NA	NA	NA	NA	<0.66
F1	GP12	soil boring	14.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	<1.00
F1	GP13	soil boring	6.5	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.66	<0.66	NA	NA	NA	NA	NA	<0.66
F1	GP14	soil boring	8	8/2/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	<0.33
F1	GP15	soil boring	7.5	8/2/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP16	soil boring	2.7	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	<0.33
F1	GP17	soil boring	6	8/2/2000	<13.2	<13.2	<13.2	<40.0	<40.0	<40.0	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2	<40.0	<13.2	<13.2	<13.2
F1	GP17C	soil boring	11.5	8/2/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP18	soil boring	1.5	8/3/2000	<0.33	<0.33	<0.33	<1.00	<1.00	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33
F1	GP19	soil boring	1.5	8/3/2000	<1.65	<1.65	<1.65	<5.00	<5.00	<5.00	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs										PCBs						
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	4-Nitrophenol	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	Pentachlorophenol	phenanthrene	Phenol	Pyrene	1,2,4-Trichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1991 Gas Station UST Removal																					
E1	service station soil (sidewall)	grab	NA	8/14/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1	service station (bottom of excavation)	grab	NA	3/10/1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2015 Woodmill Hydrocarbon Investigation by Arcadis																					
A1	B1	soil boring	3.0 - 3.5	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B2	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B3	soil boring	4.5 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	B5	soil boring	2.0 - 5.0	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1	BD-1	duplicate (B5)	--	10/8/2015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2000, 2002, and 2016 CBC Sampling																					
F1	GP1	soil boring	2.5	8/1/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP2B	soil boring	7.5	8/2/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP3	soil boring	14	8/1/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP4	soil boring	19	8/1/2000	<5.00	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	NA	NA	NA	NA	NA	NA	NA
F1	GP5	soil boring	4.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP6	soil boring	17.5	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP7C	soil boring	6	8/1/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	GP8	soil boring	31.5	8/1/2000	<1.00	NA	NA	NA	NA	<0.33	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	12	8/1/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP9	soil boring	27.5	8/1/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP10	soil boring	21.5	8/1/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP11	soil boring	10.5	8/1/2000	<2.00	NA	NA	<2.00	NA	<0.66	NA	NA	<0.66	<0.66	NA	NA	NA	NA	NA	NA	NA
F1	GP12	soil boring	14.5	8/2/2000	<1.00	NA	NA	NA	NA	<0.33	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP13	soil boring	6.5	8/2/2000	<2.00	NA	NA	<2.00	NA	<0.66	NA	NA	<0.66	<0.66	NA	NA	NA	NA	NA	NA	NA
F1	GP14	soil boring	8	8/2/2000	<1.00	<0.33	NA	<1.00	NA	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP15	soil boring	7.5	8/2/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP16	soil boring	2.7	8/3/2000	<1.00	NA	NA	<1.00	NA	<0.33	NA	NA	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP17	soil boring	6	8/2/2000	<40.0	<13.2	<13.2	<40.0	<13.2	<13.2	<13.2	<13.2	<13.2	<13.2	<0.067	<0.134	<0.067	<0.067	**0.289**	<0.067	<0.067
F1	GP17C	soil boring	11.5	8/2/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.067	<0.134	<0.067	<0.067	<0.067	<0.067	<0.067
F1	GP18	soil boring	1.5	8/3/2000	<1.00	<0.33	<0.33	<1.00	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	NA	NA	NA	NA	NA	NA	NA
F1	GP19	soil boring	1.5	8/3/2000	<5.00	<1.65	<1.65	<5.00	<1.65	<1.65	<1.65	<1.65	<1.65	<1.65	NA	NA	NA	NA	NA	NA	NA
F1	GP20	soil boring	5.5	8/3/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(13')	soil boring	13	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1(26')	soil boring	26	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-1B(28')	soil boring	28	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-2(40')	soil boring	40	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-3B(10')	soil boring	10	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(2')	soil boring	2	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-4(37')	soil boring	37	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5(10')	soil boring	10	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-5B(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-6(31')	soil boring	31	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7A(5')	soil boring	5	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

								TPH			Extractable Petroleum Hydrocarbons (EPH) by Method NWTPH/EPH							
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Total Solids	Percent Solids	Percent Moisture	GRO	DRO	ORO	C10-C12 Aromatics	C12-C16 Aromatics	C16-C21 Aromatics	C21-C34 Aromatics	C10-C12 Aliphatics	C12-C16 Aliphatics	C16-C21 Aliphatics	C21-C34 Aliphatics
			ft bgs	Units	%	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																		
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	<24.7	<61.7	<123	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	<24.3	<60.7	<121	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	88.4	NA	NA	<20	**140**	**170**	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	78.5	NA	NA	<20	<50	<100	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	82.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-2	test pit	3.2	8/15/2002	76.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP3-1	test pit	1.2	8/15/2002	91.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP3-2	test pit	3.8	8/15/2002	79.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-1	test pit	1.5	8/15/2002	79.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	77.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	86.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	86.2	NA	NA	<20	<50	**150**	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																		
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	**360**	ND	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	**1800**	**150**	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	**1600**	**310**	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	**550**	ND	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	**1500**	**340**	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	**1300**	**280**	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																		
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	< 56	< 56	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	< 55	**99**	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	25.2	NA	< 63	< 63	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	18.5	NA	< 58 J	**190 J-**	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	**470 J-**	**1200 J-**	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	**190 J+**	**620 J-**	**1100 J-**	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	10.7	NA	**82**	**310**	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	7.3	NA	< 52	< 52	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					Volatile Petroleum Hydrocarbons (VPH) by Method NWTPH/VPH							Total Metals										
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	C10-C12 Aliphatics	C5-C6 Aliphatics	C6-C8 Aliphatics	C8-C10 Aliphatics	Total VPH	C10-C12 Aromatics	C8-C10 Aromatics	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																						
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-2	test pit	3.2	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP3-1	test pit	1.2	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP3-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**345**	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**27.7**	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																						
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																						
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	< 2.5	**66**	< 0.85	**11**	**48**	**33**	**0.21**	**18**	< 2.1	< 4.2	**70**
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					VOCs																	
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																						
F1	B-7B(3')	soil boring	3	7/19/2016	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326
F1	B-7C(1')	soil boring	1	7/20/2016	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211
F1	B-7C(6')	soil boring	6	7/20/2016	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153
F1	B-7D(5')	soil boring	5	7/20/2016	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105
F1	B-8B(3')	soil boring	3	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114
F1	B-8B(6')	soil boring	6	7/19/2016	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144
F1	B-8C(9')	soil boring	9	7/19/2016	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126
F1	B-9(6')	soil boring	6	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117
F1	B-9(12')	soil boring	12	7/20/2016	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136
F1	B-10(8')	soil boring	8	7/20/2016	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133
F1	B-10(15')	soil boring	15	7/20/2016	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145
F1	B-11(1')	soil boring	1	7/19/2016	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945
F1	B-11(12')	soil boring	12	7/19/2016	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112
F1	B-11B(8')	soil boring	8	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117
F1	B-11B(18')	soil boring	18	7/20/2016	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.025	<0.0061	<0.025	<0.025	<0.025	<0.025	<0.0061	<0.0061	<0.0061	<0.025	<0.0061
F1	TP2-2	test pit	3.2	8/15/2002	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.026	<0.0064	<0.026	<0.026	<0.026	<0.026	<0.0064	<0.0064	<0.0064	<0.026	<0.0064
F1	TP3-1	test pit	1.2	8/15/2002	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.022	<0.0054	<0.022	<0.022	<0.022	<0.022	<0.0054	<0.0054	<0.0054	<0.022	<0.0054
F1	TP3-2	test pit	3.8	8/15/2002	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.026	<0.0063	<0.026	<0.026	<0.026	<0.026	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063
F1	TP4-1	test pit	1.5	8/15/2002	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.025	<0.0062	<0.025	<0.025	<0.025	<0.025	**29**	<0.0062	<0.0062	<0.0062	**0.033**
F1	TP4-2	test pit	3.8	8/15/2002	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.025	<0.0063	<0.025	<0.025	<0.025	<0.025	**14**	<0.0063	<0.0063	<0.0063	**0.017**
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	<0.0058	<0.023	<0.023	<0.023	<0.023	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	<0.0058	<0.023	<0.023	<0.023	<0.023	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																						
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																						
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					VOCs																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Isopropyltoluene	4-Methyl-2-pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	2-Butanone	n-Butylbenzene	Carbon disulfide
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																						
F1	B-7B(3')	soil boring	3	7/19/2016	<0.0326	<0.0326	<0.0326	<0.0326	<0.0651	<0.0326	<0.0326	<0.130	<0.326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.130	<0.0326	<0.0326
F1	B-7C(1')	soil boring	1	7/20/2016	<0.0211	<0.0211	<0.0211	<0.0211	<0.422	<0.0211	<0.0211	<0.0844	<0.211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0844	<0.0211	<0.0211
F1	B-7C(6')	soil boring	6	7/20/2016	<0.0153	<0.0153	<0.0153	<0.0153	<0.0307	<0.0153	<0.0153	<0.0614	<0.153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0614	<0.0153	<0.0153
F1	B-7D(5')	soil boring	5	7/20/2016	<0.0105	<0.0105	<0.0105	<0.0105	<0.021	<0.0105	<0.0105	<0.0421	<0.105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0421	<0.0105	<0.0105
F1	B-8B(3')	soil boring	3	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0228	<0.0114	<0.0114	<0.0457	<0.114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0457	<0.0114	<0.0114
F1	B-8B(6')	soil boring	6	7/19/2016	<0.0144	<0.0144	<0.0144	<0.0144	<0.0288	<0.0144	<0.0144	<0.0575	<0.144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0575	<0.0144	<0.0144
F1	B-8C(9')	soil boring	9	7/19/2016	<0.0126	<0.0126	<0.0126	<0.0126	<0.0251	<0.0126	<0.0126	<0.0503	<0.144	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0503	<0.0126	<0.0126
F1	B-9(6')	soil boring	6	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0235	<0.0117	<0.0117	<0.047	<0.117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.047	<0.0117	<0.0117
F1	B-9(12')	soil boring	12	7/20/2016	<0.0136	<0.0136	<0.0136	<0.0136	<0.0273	<0.0136	<0.0136	<0.0546	<0.136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0546	<0.0136	<0.0136
F1	B-10(8')	soil boring	8	7/20/2016	<0.0133	<0.0133	<0.0133	<0.0133	<0.0266	<0.0133	<0.0133	<0.0532	<0.133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0532	<0.0133	<0.0133
F1	B-10(15')	soil boring	15	7/20/2016	<0.0145	<0.0145	<0.0145	<0.0145	<0.0289	<0.0145	<0.0145	<0.0579	<0.145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0579	<0.0145	<0.0145
F1	B-11(1')	soil boring	1	7/19/2016	<0.00945	<0.00945	<0.00945	<0.00945	<0.0189	<0.00945	<0.00945	<0.0378	<0.0945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.0378	<0.00945	<0.00945
F1	B-11(12')	soil boring	12	7/19/2016	<0.0112	<0.0112	<0.0112	<0.0112	<0.0225	<0.0112	<0.0112	<0.0449	<0.112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0449	<0.0112	<0.0112
F1	B-11B(8')	soil boring	8	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0234	<0.0117	<0.0117	<0.0467	<0.117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0467	<0.0117	<0.0117
F1	B-11B(18')	soil boring	18	7/20/2016	<0.0123	<0.0123	<0.0123	<0.0123	<0.0246	<0.0123	<0.0123	<0.0492	<0.123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0492	<0.0123	<0.0123
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.0061	<0.0061	<0.0061	<0.025	<0.025	<0.025	<0.025	<0.025	<0.061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.025	<0.025	<0.0061
F1	TP2-2	test pit	3.2	8/15/2002	<0.0064	<0.0064	<0.0064	<0.026	<0.026	<0.026	<0.022	<0.026	<0.064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.026	<0.026	<0.0064
F1	TP3-1	test pit	1.2	8/15/2002	<0.0054	<0.0054	<0.0054	<0.022	<0.022	<0.022	<0.022	<0.022	<0.054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.022	<0.022	<0.0054
F1	TP3-2	test pit	3.8	8/15/2002	<0.0063	<0.0063	<0.0063	<0.026	<0.026	<0.026	<0.026	<0.026	<0.063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.026	<0.026	<0.0063
F1	TP4-1	test pit	1.5	8/15/2002	<0.0062	**0.13**	<0.0062	<0.025	<0.025	<0.025	<0.025	<0.025	<0.062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.025	<0.025	<0.0062
F1	TP4-2	test pit	3.8	8/15/2002	<0.0063	**0.1**	<0.0063	<0.025	<0.025	<0.025	<0.025	<0.025	<0.063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.025	<0.025	<0.0063
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.023	<0.023	<0.023	<0.023	<0.023	<0.058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	<0.023	<0.0058
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.023	<0.023	<0.023	<0.023	<0.023	<0.058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	<0.023	<0.0058
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																						
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																						
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 27	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					VOCs																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Ethyl benzene	Hexachlorobutadiene	Isopropyl benzene	Methyl tert-butyl	Methylene Chloride	m-Xylene & P-Xylene	Naphthalene	n-Butylbenzene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																					
F1	B-7B(3')	soil boring	3	7/19/2016	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.163	<0.0651	<0.0326	<0.0326
F1	B-7C(1')	soil boring	1	7/20/2016	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.105	<0.0442	<0.0211	<0.0211
F1	B-7C(6')	soil boring	6	7/20/2016	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0676	<0.0307	<0.0153	<0.0153
F1	B-7D(5')	soil boring	5	7/20/2016	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.526	<0.021	<0.0105	<0.0105
F1	B-8B(3')	soil boring	3	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0571	<0.0228	<0.0114	<0.0114
F1	B-8B(6')	soil boring	6	7/19/2016	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0719	<0.0288	<0.0144	<0.0144
F1	B-8C(9')	soil boring	9	7/19/2016	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0628	<0.0251	<0.0126	<0.0126
F1	B-9(6')	soil boring	6	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0587	<0.0235	<0.0117	<0.0117
F1	B-9(12')	soil boring	12	7/20/2016	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0682	<0.0273	<0.0136	<0.0136
F1	B-10(8')	soil boring	8	7/20/2016	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0665	<0.0266	<0.0133	<0.0133
F1	B-10(15')	soil boring	15	7/20/2016	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0723	<0.0289	<0.0145	<0.0145
F1	B-11(1')	soil boring	1	7/19/2016	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.0473	<0.0189	<0.00945	<0.00945
F1	B-11(12')	soil boring	12	7/19/2016	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0562	<0.0225	<0.0112	<0.0112
F1	B-11B(8')	soil boring	8	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0584	<0.0234	<0.0117	<0.0117
F1	B-11B(18')	soil boring	18	7/20/2016	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0615	<0.0246	<0.0123	<0.0123
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.025	<0.025	NA	<0.013	<0.0061	<0.025	<0.025
F1	TP2-2	test pit	3.2	8/15/2002	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.026	<0.026	NA	<0.013	<0.0064	<0.026	<0.026
F1	TP3-1	test pit	1.2	8/15/2002	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.022	<0.022	NA	<0.011	<0.0054	<0.022	<0.022
F1	TP3-2	test pit	3.8	8/15/2002	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.026	<0.026	NA	<0.013	<0.0063	<0.026	<0.026
F1	TP4-1	test pit	1.5	8/15/2002	<0.0062	**0.054**	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.025	NA	<0.013	<0.0062	<0.025	<0.025
F1	TP4-2	test pit	3.8	8/15/2002	<0.0063	**0.022**	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.025	NA	<0.013	<0.0063	<0.025	<0.025
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	NA	<0.012	<0.0058	<0.023	<0.023
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.023	NA	<0.012	<0.0058	<0.023	<0.023
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																					
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																					
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 54	NA	NA	NA	NA	< 270	< 81	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					VOCs													SVOCs				
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	N-Propylbenzene	o-Xylene	p-Isopropylbenzene	sec-Butylbenzene	Styrene	t-Butylbenzene	Tetrachloroethene	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene	Trichloroethene	Trichlorofluoromethane	Vinyl chloride	Acenaphthene	Acenaphthylene	Aniline	Anthracene	Benzo(a)anthracene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																						
F1	B-7B(3')	soil boring	3	7/19/2016	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	<0.0326	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	<0.0211	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	<0.0153	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	<0.0105	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	<0.0114	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	<0.0144	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	<0.0126	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	<0.0136	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	<0.0133	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	<0.0145	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	<0.00945	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	<0.0112	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	<0.0117	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	<0.0123	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.025	<0.0061	NA	<0.025	<0.0061	<0.025	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.0061	<0.41	<0.41	<1.3	<0.41	<0.41
F1	TP2-2	test pit	3.2	8/15/2002	<0.026	<0.0064	NA	<0.026	<0.0064	<0.026	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.0064	<0.43	<0.43	<1.4	<0.43	<0.43
F1	TP3-1	test pit	1.2	8/15/2002	<0.022	<0.0054	NA	<0.022	<0.0054	<0.022	**0.05**	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.0054	<0.37	<0.37	<1.1	<0.37	<0.37
F1	TP3-2	test pit	3.8	8/15/2002	<0.026	<0.0063	NA	<0.026	<0.0063	<0.026	**0.013**	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.42	<0.42	<1.3	<0.42	<0.42
F1	TP4-1	test pit	1.5	8/15/2002	<0.025	<0.0062	NA	<0.025	<0.0062	<0.025	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	<0.0062	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	<0.025	<0.0063	NA	<0.025	<0.0063	<0.025	**0.0094**	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	<0.0063	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.023	<0.0058	NA	<0.023	<0.0058	<0.023	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.38	<0.38	<1.2	<0.38	<0.38
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.023	<0.0058	NA	<0.023	<0.0058	<0.023	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.39	<0.39	<1.2	<0.39	<0.39
F1	LS-1	surface sample	1	7/19/2016	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																						
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																						
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	< 54	NA	NA	NA	NA	NA	< 200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzoic Acid	Benzyl Alcohol	4-Bromophenyl phenyl ether	Butyl benzyl phthalate	4-Chloro-3-methylphenol	4-Chloroaniline	Bis(2-chloroethoxy)methane	Bis(2-chloroethyl)ether	Bis(2-chloroisopropyl) ether	2-Chloronaphthalene	2-Chlorophenol	4-Chlorophenyl phenyl ether	Chrysene
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																					
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.41	<0.41	<0.41	<0.41	<2.5	**2.8**	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41
F1	TP2-2	test pit	3.2	8/15/2002	<0.43	<0.43	<0.43	<0.43	<2.7	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43
F1	TP3-1	test pit	1.2	8/15/2002	<0.37	<0.37	<0.37	<0.37	<2.2	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37
F1	TP3-2	test pit	3.8	8/15/2002	<0.42	<0.42	<0.42	<0.42	<2.6	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42
F1	TP4-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.38	<0.38	<0.38	<0.38	<2.4	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.39	<0.39	<0.39	<0.39	<2.4	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																					
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																					
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Di-n-butyl phthalate	Di-n-octyl phthalate	Dibenz(a,h)anthracene	Dibenzofuran	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	3,3-Dichlorobenzidine	2,4-Dichlorophenol	Diethyl phthalate	2,4-Dimethylphenol	Dimethyl phthalate	4,6-Dinitro-2-methylphenol	2,4-Dinitrophenol	2,4-Dinitrotoluene	2,6-Dinitrotoluene	Bis(2-ethylhexyl) phthalate
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																					
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0390
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0414
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0411
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0404
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0373
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0370
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.0415
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<2.5	<0.41	<0.41	<0.41	<0.41	<2.5	<2.5	<0.41	<0.41	<0.41
F1	TP2-2	test pit	3.2	8/15/2002	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<2.7	<0.43	<0.43	<0.43	<0.43	<2.7	<2.7	<0.43	<0.43	<0.43
F1	TP3-1	test pit	1.2	8/15/2002	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<2.2	<0.37	<0.37	<0.37	<0.37	<2.2	<2.2	<0.37	<0.37	<0.37
F1	TP3-2	test pit	3.8	8/15/2002	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<2.6	<0.42	<0.42	<0.42	<0.42	<2.6	<2.6	<0.42	<0.42	<0.42
F1	TP4-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<2.4	<0.38	<0.38	<0.38	<0.38	<2.4	<2.4	<0.38	<0.38	<0.38
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<2.4	<0.39	<0.39	<0.39	<0.39	<2.4	<2.4	<0.39	<0.39	<0.39
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																					
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																					
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs															
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Fluoranthene	Fluorene	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Indeno(1,2,3-cd)pyrene	Isophorone	2-Methylnaphthalene	2-Methylphenol	3-,4-Methylphenol	Naphthalene	2-Nitroaniline	3-Nitroaniline	4-Nitroaniline	Nitrobenzene	2-Nitrophenol
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																					
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	<2.5	<2.5	<2.5	<0.41	<0.41
F1	TP2-2	test pit	3.2	8/15/2002	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	<2.7	<2.7	<2.7	<0.43	<0.43
F1	TP3-1	test pit	1.2	8/15/2002	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	<2.2	<2.2	<2.2	<0.37	<0.37
F1	TP3-2	test pit	3.8	8/15/2002	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<2.6	<2.6	<2.6	<0.42	<0.42
F1	TP4-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP4-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	<2.4	<2.4	<2.4	<0.38	<0.38
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<2.4	<2.4	<2.4	<0.39	<0.39
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																					
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																					
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B2: Data Summary Table - Soil

					SVOCs										PCBs						
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	4-Nitrophenol	N-Nitrosodi-n-propylamine	N-Nitrosodiphenylamine	Pentachlorophenol	phenanthrene	Phenol	Pyrene	1,2,4-Trichlorobenzene	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
			ft bgs	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
2000, 2002, and 2016 CBC Sampling (continued)																					
F1	B-7B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(1')	soil boring	1	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7C(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-7D(5')	soil boring	5	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(3')	soil boring	3	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8B(6')	soil boring	6	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-8C(9')	soil boring	9	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(6')	soil boring	6	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-9(12')	soil boring	12	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-10(15')	soil boring	15	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(1')	soil boring	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11(12')	soil boring	12	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(8')	soil boring	8	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	B-11B(18')	soil boring	18	7/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-1	test pit	1.3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP 1-2	test pit	3	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	TP2-1	test pit	1.5	8/15/2002	<2.5	<0.41	<2.5	<2.5	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	NA	NA	NA	NA	NA	NA	NA
F1	TP2-2	test pit	3.2	8/15/2002	<2.7	<0.43	<2.7	<2.7	<0.43	<0.43	<0.43	<0.43	<0.43	<0.43	NA	NA	NA	NA	NA	NA	NA
F1	TP3-1	test pit	1.2	8/15/2002	<2.2	<0.37	<2.2	<2.2	<0.37	<0.37	<0.37	<0.37	<0.37	<0.37	NA	NA	NA	NA	NA	NA	NA
F1	TP3-2	test pit	3.8	8/15/2002	<2.6	<0.42	<2.6	<2.6	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	NA	NA	NA	NA	NA	NA	NA
F1	TP4-1	test pit	1.5	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.13	<0.25	<0.13	<0.13	<0.13	<0.13	<0.13
F1	TP4-2	test pit	3.8	8/15/2002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.13	<0.26	<0.13	<0.13	<0.13	<0.13	<0.13
F1	TP 5-1 (bkgd)	test pit	1.5	8/15/2002	<2.4	<0.38	<2.4	<2.4	<0.38	<0.38	<0.38	<0.38	<0.38	<0.38	NA	NA	NA	NA	NA	NA	NA
F1	TP 5-2 (bkgd)	test pit	3.5	8/15/2002	<2.4	<0.39	<2.4	<2.4	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.12	<0.24	<0.12	<0.12	<0.12	<0.12	<0.12
F1	LS-1	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
F1	LS-2	surface sample	1	7/19/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2017 Diesel Release Update Confirmation Sampling																					
C4	Sample #1	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #2	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #3	soil sample	confirmation bottom	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #4	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #5	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C4	Sample #6	soil sample	confirmation sidewall	8/7/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2018 March Fuel Oil Day Tank																					
B4	CAMAS TANK-ACROSS ROAD-4.5	soil sample	4.5	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-ACROSS ROAD-6.0	soil sample	6.0	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-NW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SE-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SOIL PILE	soil sample	0.1	3/19/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-3.0	soil sample	3.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B4	CAMAS TANK-SW-2.0	soil sample	2.0	3/14/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

											TPH		Dioxins and Furans					
Sample ID	Sediment Sample Depth	Sample Date	Total Solids	Total Fixed Solids	Bulk Density	pH	Total Organic Carbon	Total Organic Carbon	Total Sulfides	Total Ammonia	DRO	ORO	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD
Units	ft bss		%	%	g/cm3	s.u.	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg
NPDES Permit Monitoring																		
OF1-1	0 - 0.28	9/13/2017	71.0	NA	NA	NA	310 JH	NA	<13	<63	< 63	**16 J**	NA	NA	NA	NA	NA	NA
OF1-2	0 - 0.23	9/13/2017	71.0	NA	NA	NA	280 JH	NA	<13	<47	< 61	**17 J**	NA	NA	NA	NA	NA	NA
OF1-3	0 - 0.16	9/13/2017	69.0	NA	NA	NA	320 JH	NA	<13	<62	< 63	**12 J**	NA	NA	NA	NA	NA	NA
OF1-4	0 - 0.18	9/14/2017	73.0	NA	NA	NA	250 JH	NA	<13	<61	< 65	<65	NA	NA	NA	NA	NA	NA
OF2-1	0 - 0.23	9/12/2017	64.0	NA	NA	NA	3500 H	NA	<15	<72	<71	**70 J**	<0.0742	<0.0957	<0.0112	**0.207 J**	**0.241 J**	**2.41**
OF2-2	0 - 0.28	9/12/2017	68.0	NA	NA	NA	2100 H	NA	<14	<46	<66	**60 J**	<0.0904	<0.115	**0.144 J**	**0.121 J**	<0.201	**1.17**
OF2-3	0 - 0.28	9/12/2017	65.0	NA	NA	NA	1500 JH	NA	<13	<51	<62	**30 J**	<0.0915	<0.106	<0.0914	<0.0937	**0.107 J**	**1.11**
OF2-4	0 - 0.28	9/14/2017	73.0	NA	NA	NA	1200 JH	NA	<13	<63	<64	**23 J**	NA	NA	NA	NA	NA	NA
OF2-5	0 - 0.26	9/14/2017	67.0	NA	NA	NA	1600 JH	NA	<15	<60	<69	**23 J**	NA	NA	NA	NA	NA	NA
OF2-5D	0 - 0.26	9/14/2017	67.0	NA	NA	NA	1700 JH	NA	NA	<72	<70	**38 J**	NA	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																		
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	83.0 / 80.5	94.8	1.33	5.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #2 (mid)	NA	3/5/2020	81.4 / 82.2	95.4	1.27	5.38	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #3 (east)	NA	3/5/2020	79.7 / 82.1	95.1	1.25	5.43	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009 Camas Slough Sediment Cores																		
B13	0 - 1	8/10/2009	54.1	NA	NA	NA	NA	2.37	**76.7**	**16.1**	NA	NA	<0.248	**0.311**	**0.569**	**1.77**	**1.49**	**28.4**
B13	2 - 3	8/10/2009	54.5	NA	NA	NA	NA	2.9	**217**	**4.4**	NA	NA	**0.27**	<0.36	**0.55**	**1.88**	**1.7**	**29.9**
B13	4 - 5	8/10/2009	64.5	NA	NA	NA	NA	2.61	**211**	**1.5 J**	NA	NA	<0.829	<0.463	<0.654	**3.59**	**2.76**	**40.3**
B14	0 - 1	8/10/2009	58.3	NA	NA	NA	NA	2.3	**121**	**12.6**	NA	NA	<0.406	**0.504**	**0.622**	**2.5**	<2.20	**44.9**
B14	2 - 3	8/10/2009	60.4	NA	NA	NA	NA	2.56	**268**	**2**	NA	NA	<1.05	**1.02**	**1.05**	**20.1**	**9.9**	**236**
B14	4 - 5	8/10/2009	57.9	NA	NA	NA	NA	2.76	**327**	**2.6**	NA	NA	**1.77**	**0.774**	**1.25**	**23.7**	**8.46**	**500**
B15	0 - 1	8/10/2009	57.2	NA	NA	NA	NA	3.3	**103**	**2.3**	NA	NA	<0.215	<0.266	<0.417	**2.32**	**1.61**	**35.3**
B15	2 - 3	8/10/2009	61.7	NA	NA	NA	NA	1.68	**87.9**	**5.4**	NA	NA	<0.268	<0.205	<0.325	**1.5**	**1.12**	**18.8**
B15	4 - 5	8/10/2009	62.7	NA	NA	NA	NA	1.65	**143**	**10.6**	NA	NA	<0.294	<0.316	**0.366**	**3.09**	**1.83**	**27.9**
Z sample 2006	3 - 4	8/10/2009	56.8	NA	NA	NA	NA	1.98	**309**	**50.7**	NA	NA	**1.61**	**0.716**	**1.06**	**17**	**6.12**	**417**

Table B3: Data Summary Table - Sediment

			Dioxins and Furans												Metals			
Sample ID	Sediment Sample Depth	Sample Date	OCDD	2,3,7,8-TCDF	1,2,3,7,8-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF	TEQ (ND=0)	TEQ (ND=1/2 DL)	Aluminum	Antimony	Arsenic	Barium
Units	ft bss		ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	mg/kg	mg/kg	mg/kg	mg/kg
NPDES Permit Monitoring																			
OF1-1	0 - 0.28	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.325**	NA	NA	NA	**1.7**	NA
OF1-2	0 - 0.23	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.332**	NA	NA	NA	**1.8**	NA
OF1-3	0 - 0.16	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.344**	NA	NA	NA	**1.8**	NA
OF1-4	0 - 0.18	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.351**	NA	NA	NA	**2.1**	NA
OF2-1	0 - 0.23	9/12/2017	**15.3**	<0.0795	<0.104	<0.101	**0.104 J**	**0.127 J**	**0.145 J**	**0.108 J**	**0.388 J**	**0.138 J**	**0.900 J**	**0.35**	NA	NA	NA	**7.7**	NA
OF2-2	0 - 0.28	9/12/2017	**6.08**	<0.0744	<0.108	<0.105	<0.0897	<0.0912	**0.0948 J**	<0.0849	<0.0230	<0.0703	**0.444 J**	**0.347**	NA	NA	NA	**7.2**	NA
OF2-3	0 - 0.28	9/12/2017	**6.86**	<0.0923	<0.0915	<0.0888	<0.0819	<0.0833	<0.0828	<0.0775	<0.143	<0.101	**0.394 J**	**0.314**	NA	NA	NA	**6.5**	NA
OF2-4	0 - 0.28	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.376**	NA	NA	NA	**7.7**	NA
OF2-5	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.412**	NA	NA	NA	**8.9**	NA
OF2-5D	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**7.9**	NA
2016 & 2020 Dredged Materials Sampling																			
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**11800**	<7.9	<3.9	**106**
Sample #2 (mid)	NA	3/5/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**11400**	<5.1	<2.5	**109**
Sample #3 (east)	NA	3/5/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**14200**	<8.5	**4.4**	**126**
2009 Camas Slough Sediment Cores																			
B13	0 - 1	8/10/2009	**238**	**0.426**	<0.138	<0.292	**0.579**	**0.301**	<0.052 J	<0.274	**4.01**	**0.35**	**8.94**	**1.23**	**1.41**	NA	**0.195**	**4.59**	NA
B13	2 - 3	8/10/2009	**255**	**0.69**	<0.230	<0.33	**0.7**	<0.41	<0.06 J	<0.300	**5.04**	<0.45	**16.1**	**1.25**	**1.53**	NA	**0.29**	**4.81**	NA
B13	4 - 5	8/10/2009	**423**	**1.3**	**0.33**	**0.521**	<0.89	<0.817	<0.153	<0.450	**5.69**	**0.586**	**14.2**	**1.53**	**2.32**	NA	**0.23**	**5.57**	NA
B14	0 - 1	8/10/2009	**665**	**0.615**	**0.19**	<0.277	**0.569**	**0.336**	<0.0666	<0.266	**6.42**	**0.469**	**20.2**	**1.7**	**2.06**	NA	**0.19**	**5.06**	NA
B14	2 - 3	8/10/2009	**4120**	**3.49**	<0.516	**0.782**	**1.75**	**1.37**	**0.235 J**	<0.878	**34.7**	**2.73**	**120**	**9.05**	**9.63**	NA	**0.304**	**5**	NA
B14	4 - 5	8/10/2009	**12900**	**5.17**	**0.623**	**0.744**	**1.78**	**0.918**	**0.155 J**	<0.713	**60.9**	**3.83**	**276**	**16.53**	**16.56**	NA	**0.453**	**6.08**	NA
B15	0 - 1	8/10/2009	**486**	**1.21**	**0.213**	<0.216	**0.532**	<0.335	<0.125 J	<0.250	**4.49**	**0.322**	**15.5**	**1.13**	**1.45**	NA	**0.184**	**4.25**	NA
B15	2 - 3	8/10/2009	**166**	**1.94**	<0.223	<0.240	**0.343**	**0.338**	<0.091 J	<0.186	**3.39**	**0.284**	**11.8**	**0.8**	**1.11**	NA	**0.206**	**4.19**	NA
B15	4 - 5	8/10/2009	**258**	**1.04**	<.201	**0.291**	**0.474**	**0.445**	<0.0592 J	<0.239	**4.99**	**0.344**	**13.6**	**1.23**	**1.55**	NA	**0.265**	**5.1**	NA
Z sample 2006	3 - 4	8/10/2009	**7310**	**3.91**	**0.596**	**0.929**	**1.64**	**1.01**	**0.089 J**	**0.742**	**53.5**	**3.28**	**181**	**12.76**	**12.76**	NA	<5.9	<7	NA

Table B3: Data Summary Table - Sediment

			Metals																	
Sample ID	Sediment Sample Depth	Sample Date	Beryllium	Boron	Cadmium	Cerium	Chromium, total	Chromium, Hexavalent	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	Thallium
Units	ft bss		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NPDES Permit Monitoring																				
OF1-1	0 - 0.28	9/13/2017	NA	NA	**0.096**	NA	**8.6**	NA	NA	**5.4**	NA	**2.8**	NA	< 0.030 F1	NA	**9.5**	**0.57**	**0.01 J**	NA	NA
OF1-2	0 - 0.23	9/13/2017	NA	NA	**0.095**	NA	**8.5**	NA	NA	**5.5**	NA	**3.1**	NA	< 0.032	NA	**11**	**1.48**	< 0.059	NA	NA
OF1-3	0 - 0.16	9/13/2017	NA	NA	**0.11**	NA	**9.7**	NA	NA	**6**	NA	**3.6**	NA	< 0.036	NA	**11**	**0.54**	**0.011 J**	NA	NA
OF1-4	0 - 0.18	9/14/2017	NA	NA	**0.12**	NA	**12 B**	NA	NA	**6.6**	NA	**3.6**	NA	< 0.040	NA	**13**	**0.49**	**0.015 J**	NA	NA
OF2-1	0 - 0.23	9/12/2017	NA	NA	**0.26**	NA	**16**	NA	NA	**29**	NA	**9.8**	NA	**0.026 J**	NA	**0.15**	**0.66**	**0.035 J**	NA	NA
OF2-2	0 - 0.28	9/12/2017	NA	NA	**0.16**	NA	**17**	NA	NA	**39**	NA	**9**	NA	**0.021 J**	NA	**16**	**0.62**	**0.024 J**	NA	NA
OF2-3	0 - 0.28	9/12/2017	NA	NA	**0.16**	NA	**16**	NA	NA	**37**	NA	**7.7**	NA	**0.042**	NA	**16**	**0.52**	**0.021 J**	NA	NA
OF2-4	0 - 0.28	9/14/2017	NA	NA	**0.12**	NA	**17 B F1**	NA	NA	**40 F1**	NA	**5.7**	NA	**0.011 J**	NA	**16**	**0.86**	**0.015 J**	NA	NA
OF2-5	0 - 0.26	9/14/2017	NA	NA	**0.2**	NA	**19 B**	NA	NA	**47**	NA	**12**	NA	**0.024 J**	NA	**17**	**0.97**	**0.024 J**	NA	NA
OF2-5D	0 - 0.26	9/14/2017	NA	NA	**0.17**	NA	**18 B**	NA	NA	**43**	NA	**9.1**	NA	**0.026 J**	NA	**15**	**0.95**	**0.031 J**	NA	NA
2016 & 2020 Dredged Materials Sampling																				
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	**0.43**	<3.9	<0.2	**18.2**	**12.7**	<0.54	**7.93**	**24**	**20100**	**8**	**250**	**0.047**	**1.11**	**13.9**	<7.9	<0.79	**37.9**	<3.9
Sample #2 (mid)	NA	3/5/2020	**0.46**	<2.5	<0.13	**19.9**	**12.6**	<0.60	**7.71**	**23.9**	**18500**	**8.3**	**239**	**0.04**	<0.51	**12.7**	<5.1	<0.51	**36.8**	<2.5
Sample #3 (east)	NA	3/5/2020	**0.51**	<4.3	<0.21	**19.8**	**14.7**	<0.60	**8.92**	**26.9**	**23600**	**9.7**	**286**	**0.04**	<0.85	**14.6**	<8.5	<0.85	**44.8**	<4.3
2009 Camas Slough Sediment Cores																				
B13	0 - 1	8/10/2009	NA	NA	**0.506**	NA	**13.6**	NA	NA	**31.5**	NA	**12.7**	NA	**0.076**	NA	**13.5**	NA	**0.166**	NA	NA
B13	2 - 3	8/10/2009	NA	NA	**0.51**	NA	**14**	NA	NA	**33.8**	NA	**14.2**	NA	**0.05**	NA	**13.7**	NA	**0.18**	NA	NA
B13	4 - 5	8/10/2009	NA	NA	**0.69**	NA	**15.6**	NA	NA	**34.6**	NA	**21.8**	NA	**0.06**	NA	**15.2**	NA	**0.1**	NA	NA
B14	0 - 1	8/10/2009	NA	NA	**0.523**	NA	**13.9**	NA	NA	**32.5**	NA	**14.6**	NA	**0.07**	NA	**14.1**	NA	**0.089**	NA	NA
B14	2 - 3	8/10/2009	NA	NA	**1.25**	NA	**18.6**	NA	NA	**31.8**	NA	**24.7**	NA	**0.145**	NA	**15.1**	NA	**0.116**	NA	NA
B14	4 - 5	8/10/2009	NA	NA	**2.47**	NA	**22.6**	NA	NA	**43.2**	NA	**32.4**	NA	**0.225**	NA	**16.1**	NA	**0.149**	NA	NA
B15	0 - 1	8/10/2009	NA	NA	**0.64**	NA	**13.2**	NA	NA	**27.8**	NA	**13.1**	NA	**0.062**	NA	**13.6**	NA	**0.079**	NA	NA
B15	2 - 3	8/10/2009	NA	NA	**0.693**	NA	**13.2**	NA	NA	**24.5**	NA	**13.9**	NA	**0.049**	NA	**14.2**	NA	**0.101**	NA	NA
B15	4 - 5	8/10/2009	NA	NA	**0.885**	NA	**15.4**	NA	NA	**29.2**	NA	**17**	NA	**0.067**	NA	**16**	NA	**0.098**	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	**2.1**	NA	**27.1**	NA	NA	**46.8**	NA	**29.5**	NA	**0.183**	NA	**17.3**	NA	<0.7	NA	NA

Table B3: Data Summary Table - Sediment

			Metals			TCLP Metals								TCLP VOCs							
Sample ID	Sediment Sample Depth	Sample Date	Tin	Vanadium	Zinc	Arsenic	Barium	Cadmium	Chromium, total	Lead	Mercury	Selenium	Silver	1,1-Dichloroethene	1,2-Dichloroethane	1,4-Dichlorobenzene	2-Butanone	Benzene	Carbon tetrachloride	Chlorobenzene	Chloroform	Tetrachloroethene	Trichloroethene
Units	ft bss		mg/kg	mg/kg	mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NPDES Permit Monitoring																							
OF1-1	0 - 0.28	9/13/2017	NA	NA	**39**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-2	0 - 0.23	9/13/2017	NA	NA	**41**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-3	0 - 0.16	9/13/2017	NA	NA	**48**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-4	0 - 0.18	9/14/2017	NA	NA	**49**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-1	0 - 0.23	9/12/2017	NA	NA	**85**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-2	0 - 0.28	9/12/2017	NA	NA	**75**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-3	0 - 0.28	9/12/2017	NA	NA	**65**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-4	0 - 0.28	9/14/2017	NA	NA	**73**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-5	0 - 0.26	9/14/2017	NA	NA	**94**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-5D	0 - 0.26	9/14/2017	NA	NA	**88**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																							
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	<0.05	<1	<0.05	<0.05	<0.05	<0.001	<0.1	<0.05	<0.2	<0.2	<0.2	<8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sample #1 (west)	NA	3/5/2020	<3.9	**51.9**	**69.4**	<0.1	<2	<0.05	<0.05	<0.05	<0.001	<0.1	<0.05	<0.2	<0.2	<0.2	<8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sample #2 (mid)	NA	3/5/2020	<2.5	**50.6**	**71.5**	<0.1	<2	<0.05	<0.05	<0.05	<0.001	<0.1	<0.05	<0.2	<0.2	<0.2	<8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sample #3 (east)	NA	3/5/2020	<4.3	**61.2**	**82.4**	<0.1	<2	<0.05	<0.05	<0.05	<0.001	<0.1	<0.05	<0.2	<0.2	<0.2	<8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2009 Camas Slough Sediment Cores																							
B13	0 - 1	8/10/2009	NA	NA	**87**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	**91.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	**121**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	**94**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	**157**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	**225**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	**105**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	**173**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	**153**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	**207**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

			TLCP VOCs	Organics (SVOCs, Pesticides, Herbicides, Insecticides, PAHs, PCBs)																	
Sample ID	Sediment Sample Depth	Sample Date	Vinyl chloride	4-Methyl phenol	Benzoic Acid	Beta-Hexachlorocyclohexane	Bis(2-ethylhexyl) phthalate	Carbazole	Dibenzofuran	Dibutyltin	Dieldrin	Di-n-butyl phthalate	Di-n-octyl phthalate	Endrin Ketone	Monobutyltin	Pentachlorophenol	Phenol	Tetrabutyltin	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene
Units	ft bss		mg/L	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NPDES Permit Monitoring																							
OF1-1	0 - 0.28	9/13/2017	NA	<52	<650	<0.13 F1	<160	<39	<39	<16 H	<0.26 F1	<130	<26 H F2	**0.019 J p**	<9.9 H	<100	<39	<49 H	NA	NA	NA	NA	NA
OF1-2	0 - 0.23	9/13/2017	NA	<52	<650	<0.12	<160	<39	<39	<16 H	<0.25	<130	<26 H	<0.25	<9.7 H	<100	<39	<49 H	NA	NA	NA	NA	NA
OF1-3	0 - 0.16	9/13/2017	NA	<50	<630	**0.07 J**	<150	<38	<38	<16 H	<0.25 p	<130	<25 H	<0.25	<9.6 H	<100	<38	<48 H	NA	NA	NA	NA	NA
OF1-4	0 - 0.18	9/14/2017	NA	<26 H	<330 H	<0.13	<79 H	<200	<200	<17 H	<0.26	<66 H	<26 H	<0.26	<11 H	<530	<20 H	<54 H	NA	NA	NA	NA	NA
OF2-1	0 - 0.23	9/12/2017	NA	<150	<1900	<0.72	<450	<110	<110	<19 H	<1.4	<370	<30 H	<1.4	<12 H	<300	<110	<59 H	NA	NA	NA	NA	NA
OF2-2	0 - 0.28	9/12/2017	NA	<130	<1600	<0.69	<380	<95	<95	<17 H	<1.4	<320	<25 H	<1.4	<11 H	<250	<95	<53 H	NA	NA	NA	NA	NA
OF2-3	0 - 0.28	9/12/2017	NA	<120	<1500	<0.65	<360	<91	<91	<17 H	<1.3	<300	<24 H	<1.3	<10 H	<240	<91	<51 H	NA	NA	NA	NA	NA
OF2-4	0 - 0.28	9/14/2017	NA	<250	<320 H	<0.64	**20 J H F2**	<190	<190	<16 H	<1.3	<65 H	<26 H	<1.3	<10 H F2	<500	<19 H	<50 H F2	NA	NA	NA	NA	NA
OF2-5	0 - 0.26	9/14/2017	NA	<29 H	<360 H	<0.74	<86 H	<220	<22 H	<19 H	<1.5	<72 H	<29 H	<1.5	<11 H	<590	<22 H	<57 H	NA	NA	NA	NA	NA
OF2-5D	0 - 0.26	9/14/2017	NA	<29 H	<360 H	<0.71	<86 H	<210	<22 H	<18 H	<1.4	<72 H	<29 H	<1.4	<11 H	<560	<22 H	<56 H	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																							
12202016.1 - Camas Slough	NA	12/20/2016	<0.08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	<0.08	NA	NA	NA	NA	NA	< 390	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.39	<0.39	<0.39	<0.39	<0.39
Sample #2 (mid)	NA	3/5/2020	<0.08	NA	NA	NA	NA	NA	< 400	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.40	<0.40	<0.40	<0.40	<0.40
Sample #3 (east)	NA	3/5/2020	<0.08	NA	NA	NA	NA	NA	< 400	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.40	<0.40	<0.40	<0.40	<0.40
2009 Camas Slough Sediment Cores																							
B13	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

			Organics (SVOCs, Pesticides, Herbicides, Insecticides, PAHs, PCBs)																		
Sample ID	Sediment Sample Depth	Sample Date	Benzo(a)pyrene	Benzo(b)fluoroanthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	2,4,5-Trichlorophenol, TCLP	2,4,6-Trichlorophenol, TCLP	2,4-Dinitrotoluene, TCLP	2-Methylphenol, TCLP	4-Methlylphenol, TCLP	Hexachlorobenzene, TCLP	Hexachlorobutadiene, TCLP	Hexachloroethane, TCLP	Nitrobenzene, TCLP
Units	ft bss		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NPDES Permit Monitoring																							
OF1-1	0 - 0.28	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-2	0 - 0.23	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-3	0 - 0.16	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF1-4	0 - 0.18	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-1	0 - 0.23	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-2	0 - 0.28	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-3	0 - 0.28	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-4	0 - 0.28	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-5	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OF2-5D	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																							
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sample #1 (west)	NA	3/5/2020	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.39	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sample #2 (mid)	NA	3/5/2020	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sample #3 (east)	NA	3/5/2020	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
2009 Camas Slough Sediment Cores																							
B13	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

			Organics (SVOCs, Pesticides, Herbicides, Insecticides, PAHs, PCBs)															
Sample ID	Sediment Sample Depth	Sample Date	Pentachlorophenol, TCLP	Pyridine, TCLP	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB Aroclors	TCLP PCBs	Chlordane	Endrin	Heptachlor	Heptachlor Epoxide	Methoxychlor	Toxaphene
Units	ft bss		mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/kg	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NPDES Permit Monitoring																			
OF1-1	0 - 0.28	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.4	NA	NA	NA	NA	NA	NA	NA
OF1-2	0 - 0.23	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.4	NA	NA	NA	NA	NA	NA	NA
OF1-3	0 - 0.16	9/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.4	NA	NA	NA	NA	NA	NA	NA
OF1-4	0 - 0.18	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
OF2-1	0 - 0.23	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.6	NA	NA	NA	NA	NA	NA	NA
OF2-2	0 - 0.28	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.5	NA	NA	NA	NA	NA	NA	NA
OF2-3	0 - 0.28	9/12/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.3	NA	NA	NA	NA	NA	NA	NA
OF2-4	0 - 0.28	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.4	NA	NA	NA	NA	NA	NA	NA
OF2-5	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.7	NA	NA	NA	NA	NA	NA	NA
OF2-5D	0 - 0.26	9/14/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1.6	NA	NA	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																			
12202016.1 - Camas Slough	NA	12/20/2016	<0.25	<0.50	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	< 2.0	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	<0.25	<0.50	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	NA	< 0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0020
Sample #2 (mid)	NA	3/5/2020	<0.25	<0.50	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	NA	< 0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0020
Sample #3 (east)	NA	3/5/2020	<0.25	<0.50	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	NA	< 0.50	<0.0010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0020
2009 Camas Slough Sediment Cores																			
B13	0 - 1	8/10/2009	NA	NA	<10	<20	<10	<10	<10	<10	<10	<20	NA	NA	NA	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	<10	<20	<10	<10	<10	<10	<10	<20	NA	NA	NA	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	<10	<60	<10	<10	<10	<13	<10	<60	NA	NA	NA	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	<10	<20	<10	<10	<10	<10	<10	<20	NA	NA	NA	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	<10	<20	<10	<10	<10	**92**	<10	**92**	NA	NA	NA	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	<9.9	<20	<9.9	<9.9	<9.9	**44**	<9.9	**44**	NA	NA	NA	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	<9.9	<20	<9.9	<9.9	<9.9	<9.9	<9.9	<20	NA	NA	NA	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	<9.9	<20	<9.9	<9.9	<9.9	<9.9	<9.9	<20	NA	NA	NA	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	<10	<20	<10	<10	<10	<10	<10	<20	NA	NA	NA	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

			Organics							Grain Size					Sediment Biological				
Sample ID	Sediment Sample Depth	Sample Date	2,4-D [(e)]	2,4,5-TP	Total DDDs	Total DDEs	Total DDTs	Total PAHs	Tributyltin	Clay	Sand	Silt	Gravel	Cobble	Hyallela (10-day) Percent Mortality (Mean ± SD)	Hyallela (10-day) Significantly Higher than Control	Hyallela (10-day) Percent Higher Than Control	Chironomus (20-day) Percent Mortality (Mean ± SD)	Chironomus (20-day) Significantly Higher than Control
Units	ft bss		µg/L	µg/L	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	%	%	%	%	%					
NPDES Permit Monitoring																			
OF1-1	0 - 0.28	9/13/2017	NA	NA	<0.26 p	**0.021 J p**	<0.26	<200.5	<8.6 H	**0.1**	**100**	**0.3**	**0.1**	**0**	**1.3 ± 3.5**	No	0	**15.0 ± 14.1**	Yes
OF1-2	0 - 0.23	9/13/2017	NA	NA	<0.25	**0.022 J p**	<0.25	<200.5	<8.5 H	**0.1**	**99**	**0.7**	**0.1**	**0**	**0.0 ± 0.0**	No	-1.3	**11.3 ± 14.6**	No
OF1-3	0 - 0.16	9/13/2017	NA	NA	<0.25	**0.019 J p**	<0.25	<193.1 F1 F2	<8.4 H	**0.2**	**99**	**0.5**	**0**	**0**	**2.5 ± 7.1**	No	1.2	**5.0 ± 7.6**	No
OF1-4	0 - 0.18	9/14/2017	NA	NA	<0.26	<0.26	<0.26	<1016	<9.4 H	**0.1**	**99**	**0.4**	**0.1**	**0**	**3.8 ± 7.4**	No	2.5	**12.5 ± 11.6**	Yes
OF2-1	0 - 0.23	9/12/2017	NA	NA	<1.4	<1.4	<1.4	<572	<10 H	**1**	**87**	**9.5**	**2.6**	**0**	**3.8 ± 7.4**	No	2.5	**13.8 ± 13.0**	Yes
OF2-2	0 - 0.28	9/12/2017	NA	NA	<1.4	<1.4	<1.4	**45.4 J ***	<9.2 H	**0.5**	**91**	**4.6**	**4.1**	**0**	**0.0 ± 0.0**	No	-1.3	**8.8 ± 8.3**	No
OF2-3	0 - 0.28	9/12/2017	NA	NA	<1.3	<1.3	<1.3	<460	<9.0 H	**0.5**	**91**	**4.6**	**4.1**	**0**	**1.3 ± 3.5**	No	0	**7.1 ± 7.6**	No
OF2-4	0 - 0.28	9/14/2017	NA	NA	<1.3	<1.3	<1.3	<958 F2	<8.8 H	**0.2**	**70**	**1.3**	**29**	**0**	**0.0 ± 0.0**	No	-1.3	**8.8 ± 6.4**	Yes
OF2-5	0 - 0.26	9/14/2017	NA	NA	<1.5	<1.5	<1.5	<1124	<10 H	**0.5**	**95**	**3.4**	**0.8**	**0**	**1.3 ± 3.5**	No	0	**12.56 ± 12.8**	Yes
OF2-5D	0 - 0.26	9/14/2017	NA	NA	<1.4	<1.4	<1.4	<1076	<9.7 H	**0.5**	**95**	**3.4**	**0.9**	**0**	NA	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling																			
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	<100	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #2 (mid)	NA	3/5/2020	<100	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sample #3 (east)	NA	3/5/2020	<100	<20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2009 Camas Slough Sediment Cores																			
B13	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B3: Data Summary Table - Sediment

			Sediment Biological			
Sample ID	Sediment Sample Depth	Sample Date	Chironomus (20-day) Percent Higher Than Control	Chironomus (20-day) Avg. Ash-free Dry Wt/Midge (mg) (Mean ± SD)	Chironomus (20-day) Significantly Lower than Control	Chironomus (20-day) Percent Lower Than Control
Units	ft bss					
NPDES Permit Monitoring						
OF1-1	0 - 0.28	9/13/2017	12.5	**1.35 ± 0.14**	Yes	17.5
OF1-2	0 - 0.23	9/13/2017	8.8	**1.24 ± 0.16**	Yes	23.9
OF1-3	0 - 0.16	9/13/2017	2.5	**1.17 ± 0.12**	Yes	28.9
OF1-4	0 - 0.18	9/14/2017	10	**1.32 ± 0.20**	Yes	19.1
OF2-1	0 - 0.23	9/12/2017	11.3	**1.51 ± 0.28**	No	7.5
OF2-2	0 - 0.28	9/12/2017	6.3	**1.35 ± 0.16**	Yes	17.5
OF2-3	0 - 0.28	9/12/2017	4.6	**1.32 ± 0.11**	Yes	19.3
OF2-4	0 - 0.28	9/14/2017	6.3	**1.49 ± 0.14**	Yes	9
OF2-5	0 - 0.26	9/14/2017	10	**1.43 ± 0.20**	Yes	12.4
OF2-5D	0 - 0.26	9/14/2017	NA	NA	NA	NA
2016 & 2020 Dredged Materials Sampling						
12202016.1 - Camas Slough	NA	12/20/2016	NA	NA	NA	NA
Sample #1 (west)	NA	3/5/2020	NA	NA	NA	NA
Sample #2 (mid)	NA	3/5/2020	NA	NA	NA	NA
Sample #3 (east)	NA	3/5/2020	NA	NA	NA	NA
2009 Camas Slough Sediment Cores						
B13	0 - 1	8/10/2009	NA	NA	NA	NA
B13	2 - 3	8/10/2009	NA	NA	NA	NA
B13	4 - 5	8/10/2009	NA	NA	NA	NA
B14	0 - 1	8/10/2009	NA	NA	NA	NA
B14	2 - 3	8/10/2009	NA	NA	NA	NA
B14	4 - 5	8/10/2009	NA	NA	NA	NA
B15	0 - 1	8/10/2009	NA	NA	NA	NA
B15	2 - 3	8/10/2009	NA	NA	NA	NA
B15	4 - 5	8/10/2009	NA	NA	NA	NA
Z sample 2006	3 - 4	8/10/2009	NA	NA	NA	NA

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					Total Metals																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium, total	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Mercury	Nickel	Phosphorus
			ft bss	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Primary Solids																						
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																						
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	**11600**	< 10	**2**	**199**	< 1.0	**5.1**	**57000**	**44**	**3.2**	**295**	**5920**	< 20	**3370**	**1180**	**23**	< 0.2	**27**	**3530**
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: Secondary sludge samples collected by GP in 2003 and 2006 were analyzed by the (now discontinued) EPA SW-846 Method for reactive sulfides and reactive cyanides.

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					Total Metals									TCLP Metals								
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Potassium	Selenium	Silver	Sodium	Strontium	Tin	Titanium	Vanadium	Zinc	Arsenic	Barium	Cadmium	Chromium, total	Lead	Mercury	Selenium	Silver	Zinc
			ft bss	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Primary Solids																						
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																						
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**1.3**	< 0.01	< 0.01	< 0.05	< 0.001	<0.1	< 0.1	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	< 400	< 1.0	**3.1**	**2450**	**143**	**13**	**299**	**26**	**629**	< 0.1	< 1.0	< 0.01	< 0.01	< 0.05	< 0.001	NA	< 0.1	< 0.02
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 1.0	< 0.01	< 0.01	< 0.05	< 0.001	NA	< 0.1	< 0.02
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 1.0	< 0.01	< 0.01	< 0.05	< 0.02	NA	< 0.1	< 0.02
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 1.0	< 0.01	< 0.01	< 0.05	< 0.001	NA	< 0.1	< 0.02
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 1.0	< 0.01	< 0.01	< 0.05	< 0.001	NA	< 0.1	< 0.02
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.969**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.872**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.76**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**1.04**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.982**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.327**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.571**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.564**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.498**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.342**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.213**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.264**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.201**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	**0.199**	< 0.1	< 0.1	< 0.1	< 0.01	< 0.1	< 0.1	NA

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					TCLP VOCs										SVOCs								
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,1-Dichloroethene	1,2-Dichloroethane	Benzene	Carbon Tetrachloride	Chlorobenzene	Chloroform	Methyl ethyl ketone (2-Butanone)	Tetrachloroethene (PCE)	Trichloroethene (TCE)	Vinyl Chloride	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzoic Acid
			ft bss	Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Primary Solids																							
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																							
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.5	< 3.5	< 3.5	< 35	< 35	< 35	< 35	< 35	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 50.0	< 50.0	< 50.0	< 50.0	< 50.0	< 250	< 500	< 50.0	< 50.0	< 50.0	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					SVOCs										TCLP SVOCs								
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Chrysene	Dibenzo(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	phenanthrene	Pyrene	Pyridine	1,4-Dichlorobenzene	2-Methylphenol	Hexachloroethane	4-Methylphenolt	Nitrobenzene	Hexachlorobutadiene	2,4,6-Trichlorophenol	2,4,5-Trichlorophenol
			ft bss	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Primary Solids																							
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																							
D1	secondary solids	Secondary Solids	--	8/12/2003	< 35	< 35	< 3.5	< 3.5	< 3.5	< 35	< 3.5	< 3.5	**4.4**	< 35	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.5	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.5	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					TCLP SVOCs			Organochlorine Pesticides							TCLP Chlorinated Herbicides		Dioxins/Furans				
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	2,4-Dinitrotoluene	Hexachlorobenzene	Pentachlorophenol	Chlordane	Endrin	Gamma-BHC (Lindane)	Heptachlor	Methoxychlor	Toxaphene	Extractable Organic Halides	2,4-D	2,4,5-TP	Total Tetrachlorodibenzo-p-dioxin (TCDD)	Total Tetrachlorodibenzofuran (TCDF)	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,6,7,8-Heptachlorodibenzo-p-Dioxin	1,2,3,4,7,8,9-Heptachlorodibenzofuran
			ft bss	Units	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg
Primary Solids																					
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12	<0.15	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.099	**0.237**	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.0347	**0.562**	NA	NA	NA
Secondary Solids																					
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	**>10**	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	**165**	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	< 0.1	< 0.1	< 0.25	NA	NA	NA	NA	NA	NA	**37**	< 100	< 20	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/21/2008	< 0.1	< 0.1	< 0.25	NA	NA	NA	NA	NA	NA	**210**	< 100	< 20	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	**229**	NA	NA	**156**	**964**	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1050**	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 1290	< 20.0	< 20.0	**2.4**	**7.1**	**9.7**	**82**	**1.0 J**
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 1850	< 20.0	< 20.0	**11**	**12**	**6.1**	**57**	< 0.69 U
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 267	< 20.0	< 20.0	**16**	**5.4**	**2.5 J**	**18**	< 0.58 U
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 754	< 20.0	< 20.0	**14**	**13**	**3.3 J**	**57 J**	< 0.30 U
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 378	< 20.0	< 20.0	**33**	**14**	**2.7 J**	**46**	< 0.58 U
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 1700	< 20.0	< 20.0	**7.9**	**5.7**	**1.5 J**	**23**	< 0.61 U
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 447	< 20.0	< 20.0	**130 J**	**41**	**9.8**	**140**	**1.3 J**
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 503	< 20.0	< 20.0	**48 J**	**42**	**10**	**130**	**1.2 J**
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 2890	< 20.0	< 20.0	**23 D**	**12 D**	**5.0 J**	**96 D**	< 2.1 DU
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 447	< 20.0	< 20.0	**980 J**	**170**	**16**	**600**	**2.0 J**
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 489	< 20.0	< 20.0	**740**	**170**	**62**	**1300**	< 3.9 U
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 417	< 20.0	< 20.0	**1700**	**330**	**79**	**2200**	< 9.6 U
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 486	< 20.0	< 20.0	**270**	**62**	**9.6 J**	**250**	< 4.4 U
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.1	< 0.1	< 0.1	< 5.00	< 5.00	< 5.00	< 4.00	< 5.00	< 10.0	< 2140	< 20.0	< 20.0	**250**	**67**	**26 J**	**390**	< 5.6 U

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					Dioxins/Furans																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,4,7,8-Hexachlorodibenzo-p-Dioxin	1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-Hexachlorodibenzo-p-Dioxin	1,2,3,7,8,9-Hexachlorodibenzofuran	1,2,3,7,8,9-Hexachlorodibenzo-p-Dioxin	1,2,3,7,8-Pentachlorodibenzofuran	1,2,3,7,8-Pentachlorodibenzo-p-Dioxin	2,3,4,6,7,8-Hexachlorodibenzofuran	2,3,4,7,8-Pentachlorodibenzofuran	2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD)	Octachlorodibenzofuran (OCDF)	Octachlorodibenzo-p-Dioxin (OCDD)	Total Heptachlorodibenzofuran (HpCDF)	Total Heptachlorodibenzo-p-dioxin (HpCDD)	Total Hexachlorodibenzofuran (HxCDF)	Total Hexachlorodibenzo-p-dioxin (HxCDD)
			ft bss	Units	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg	ng/kg
Primary Solids																					
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																					
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	**1.2 J**	**2.3 J**	**0.73 J**	**12**	< 0.68 U	**8.0**	**1.5 J**	**3.1 J**	**1.3 J**	**1.2 J**	**2.7 J**	< 0.43 U	**17**	**630**	**11**	**170**	**1.3 J**	**97**
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	**0.99 J**	**2.0 J**	**1.1 J**	**9.1**	**0.90 J**	**5.5**	**0.84 J**	**1.5 J**	**1.6 J**	**1.4 J**	**1.7**	**0.35 J**	**11**	**360**	**6.1**	**120**	**7.8**	**79**
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	**0.47 J**	< 0.61 U	< 0.36 U	**6.2**	**0.50 J**	**3.3 J**	**0.35 J**	**0.59 J**	**0.43 J**	**0.40 J**	**3.3**	**1.6**	**11**	**110 J**	**6.4**	**28**	**3.9 J**	**46**
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	**0.71 J**	**1.6 J**	**0.66 J**	**14**	**0.44 J**	**8.6**	**0.92 J**	**1.7 J**	**1.1 J**	**0.85 J**	**2.8 J**	**0.60 J**	**7.2 J**	**260 J**	**3.3 J**	**120**	**5.1**	**110**
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	**1.1 J**	**0.86 J**	**0.42 J**	**15**	**0.58 J**	**7.6**	**0.80 J**	**1.7 J**	**0.51 J**	**0.64 J**	**20**	**9.1**	**7.5 J**	**220**	**6.4**	**66**	**8.4**	**110**
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	**0.44 J**	**0.91 J**	< 0.33 U	**7.8**	**0.45 J**	**3.5 J**	**0.41 J**	**0.95 J**	< 0.44 U	**0.56 J**	**2.1**	**0.98 J**	**3.8 J**	**130**	**3.5 J**	**38**	**0.65 J**	**52**
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	**2.8 J**	**2.2 J**	**1.4 J**	**43**	**1.2 J**	**24**	**1.8 J**	**4.7 J**	**1.9 J**	**3.0 J**	**33 J**	**14**	**30**	**770**	**22 J**	**230**	**15 J**	**340**
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	**2.6 J**	**2.6 J**	**1.5 J**	**46**	**0.84 J**	**25**	**3.5 J**	**5.1**	**1.7 J**	**3.1 J**	**23 J**	**13**	**34**	**760**	**10 J**	**230**	**5.8 J**	**340**
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	**1.3 J**	**2.3 J**	**1.0 J**	**30 D**	< 1.4 DU	**15 J**	< 1.2 DU	**5.1 JD**	< 0.99 DU	< 1.1 DU	**7.4 D**	**1.9 JD**	**11 J**	**460 D**	**8.6 J**	**190 D**	< 0.91 DU	**210 D**
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	**3.2 J**	< 0.66 U	**2.4 J**	**1000**	**2.1 J**	**470**	**19**	**54**	**2.9 J**	**24**	**540 J**	**100**	**74**	**1800**	**16**	**1100**	**36**	**7400 J**
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	**9.2 J**	< 2.3 U	**12**	**2500**	< 2.7 U	**1100**	**11**	**91**	**6.3 J**	**12**	**350**	**76**	**300**	**4400**	**62**	**2200**	**66**	**18000 J**
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	**12 J**	< 2.9 U	**10 J**	**5500**	< 4.1 U	**2600**	**50 J**	**220**	**14**	**34**	**790**	**160**	**360**	**4000**	**210**	**4000**	**190**	**40000 J**
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	**2.5 J**	< 2.0 U	< 2.0 U	**470**	**2.1 J**	**220**	**4.4 J**	**22 J**	**2.0 J**	**4.6 J**	**92**	**23**	**34 J**	**680**	**24**	**410**	**22 J**	**3100**
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	**3.0 J**	< 5.3 U	< 2.9 U	**610**	< 1.9 U	**280**	**4.1 J**	**24 J**	< 3.5 U	**4.7 J**	**89**	**24**	**77 J**	**1200 J**	**74**	**650**	**18 J**	**4000**

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					Dioxins/Furans		PCBs							TCLP PCBs							PAHs	
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Total Pentachlorodibenzofuran (PeCDF)	Total Pentachlorodibenzo-p-dioxin (PeCDD)	PCB-1016 (Aroclor 1016)	PCB-1221 (Aroclor 1221)	PCB-1232 (Aroclor 1232)	PCB-1242 (Aroclor 1242)	PCB-1248 (Aroclor 1248)	PCB-1254 (Aroclor 1254)	PCB-1260 (Aroclor 1260)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Naphthalene	1-Methylnaphthalene
			ft bss	Units	ng/kg	ng/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/kg	mg/kg
Primary Solids																						
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5.0	<10.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																						
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.3	< 17	< 4.2	< 7.9	< 4.4	< 8.8	< 5.4	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.5	< 1.0	< 0.5	< 0.5	< 0.5	< 0.60	< 0.61	**69**	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 4.0	< 2.1	< 2.0	< 2.0	< 2.0	< 2.0	**63**	NA
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**37**	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	**5.3**	**4.1 J**	< 0.437	< 0.437	< 0.437	< 0.437	< 0.219	< 0.219	< 0.219	NA	NA	NA	NA	NA	NA	NA	< 0.257	< 0.257
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	**12**	**27**	< 0.628	< 0.628	< 0.628	< 0.628	< 0.314	< 0.314	< 0.314	NA	NA	NA	NA	NA	NA	NA	< 0.369	< 0.369
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	**7.9**	**6.8**	< 0.0906	< 0.0906	< 0.0906	< 0.0906	< 0.0453	< 0.0453	< 0.0453	NA	NA	NA	NA	NA	NA	NA	< 0.0533	< 0.0533
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	**13**	**28**	< 0.256	< 0.256	< 0.256	< 0.256	< 0.128	< 0.128	< 0.128	NA	NA	NA	NA	NA	NA	NA	< 0.151	< 0.151
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	**19**	**18**	< 0.129	< 0.129	< 0.129	< 0.129	< 0.0643	< 0.0643	< 0.0643	NA	NA	NA	NA	NA	NA	NA	< 0.0756	< 0.0756
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	**4.6 J**	**13**	< 0.578 J	< 0.578 J	< 0.578 J	< 0.578 J	< 0.289 J	< 0.289 J	< 0.289 J	NA	NA	NA	NA	NA	NA	NA	**0.0932 J**	< 0.340
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	**65**	**62**	< 0.171	< 0.171	< 0.171	< 0.171	< 0.0856	< 0.0856	< 0.0856	NA	NA	NA	NA	NA	NA	NA	**0.0364 J**	< 0.0895
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	**51**	**85**	< 0.152	< 0.152	< 0.152	< 0.152	< 0.0761	< 0.0761	< 0.0761	NA	NA	NA	NA	NA	NA	NA	< 0.101	< 0.101
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 1.2 DU	**37 D**	< 0.984	< 0.984	< 0.984	< 0.984	< 0.492	< 0.492	< 0.492	NA	NA	NA	NA	NA	NA	NA	< 0.579	< 0.579
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	**280**	**460**	< 0.152	< 0.152	< 0.152	< 0.152	< 0.0759	< 0.0759	< 0.0759	NA	NA	NA	NA	NA	NA	NA	< 0.0893	< 0.0893
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	**340**	**1200**	< 0.166	< 0.166	< 0.166	< 0.166	< 0.0832	< 0.0832	< 0.0832	NA	NA	NA	NA	NA	NA	NA	< 0.0978	< 0.0978
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	**670**	**2200**	< 0.142	< 0.142	< 0.142	< 0.142	< 0.0709	< 0.0709	< 0.0709	NA	NA	NA	NA	NA	NA	NA	< 0.0835	< 0.0835
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	**91**	**220**	< 0.165	< 0.165	< 0.165	< 0.165	< 0.0825	< 0.0825	< 0.0825	NA	NA	NA	NA	NA	NA	NA	< 0.0971	**0.0240 J**
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	**100**	**270**	< 0.729	< 0.729	< 0.729	< 0.729	< 0.364	< 0.364	< 0.364	NA	NA	NA	NA	NA	NA	NA	< 0.429	< 0.429

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

					PAHs																
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	2-Chloronaphthalene	2-Methylnaphthalene	Acenaphthylene	Acenaphthene	Fluorene	Dibenzofuran	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Indeno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene	Benzo(g,h,i)perylene
			ft bss	Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Primary Solids																						
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																						
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	**0.025**	< 0.0094	**0.013**	**0.11**	< 0.0094	**0.26**	**21**	< 0.0094	**0.11**	**0.028**	< 0.0094	**0.015**	**0.056**	**0.017**	< 0.0094	< 0.0094	**0.017**
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	**0.24**	< 0.016	**0.021**	**0.16**	< 0.096	**0.46**	**0.22**	< 0.096	< 0.096	**0.021**	< 0.0096	< 0.096	**0.12**	**0.012**	< 0.0096	< 0.0096	**0.015**
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	**0.062**	< 0.019	**0.05**	**0.1**	< 0.036	**1.4**	< 0.25	**1.1**	**1.5**	**0.14**	**0.03**	**0.3**	**0.65**	**0.075**	**0.036**	**0.018**	**0.057**
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.257	**0.0588 J**	< 0.0772	< 0.0772	< 0.0772	NA	< 0.0772	**0.0471 J**	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772	< 0.0772
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	< 0.369	< 0.369	< 0.111	< 0.111	< 0.111	NA	< 0.111	**0.510**	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111	< 0.111
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	< 0.0533	< 0.0533	< 0.0160	< 0.0160	< 0.0160	NA	< 0.0160	**22.8**	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160	< 0.0160
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	< 0.151	< 0.151	< 0.0452	< 0.0452	< 0.0452	NA	< 0.0452	**3.85**	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452	< 0.0452
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	< 0.0756	< 0.0756	< 0.0227	< 0.0227	< 0.0227	NA	< 0.0227	**0.405**	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227	< 0.0227
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.340	**0.0861 J**	< 0.102	< 0.102	< 0.102	NA	< 0.102	**2.02**	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102	< 0.102
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	< 0.0895	< 0.0895	< 0.0268	< 0.0268	**0.0272**	NA	< 0.0268	**6.35 J**	**0.0225 J**	**0.0162 J**	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	< 0.101	< 0.101	< 0.0302	< 0.0302	**0.0128 J**	NA	< 0.0302	**1.56 J**	**0.0120 J**	**0.0119 J**	< 0.0302	< 0.0302	< 0.0302	< 0.0302	< 0.0302	< 0.0302	< 0.0302	< 0.0302
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	< 0.579	< 0.579	< 0.174	< 0.174	< 0.174	NA	< 0.174	**1.89**	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174	< 0.174
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	< 0.0893	< 0.0893	< 0.0268	< 0.0268	**0.0158 J**	NA	**0.0661**	**0.426**	**0.0126 J**	**0.0221 J**	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268	< 0.0268
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.0978	< 0.0978	< 0.0294	< 0.0294	**0.0183 J**	NA	**0.0656**	**1.68**	**0.0234 J**	**0.0215 J**	< 0.0294	< 0.0294	< 0.0294	< 0.0294	< 0.0294	< 0.0294	< 0.0294	< 0.0294
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.0835	< 0.0835	< 0.0250	< 0.0250	< 0.0250	NA	**0.0421**	**0.663**	**0.0216 J**	**0.0338**	**0.0100 J**	< 0.0250	**0.0173 J**	**0.0256**	**0.0126 J**	**0.0164 J**	< 0.0250	< 0.0250
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.0971	< 0.0971	< 0.0291	< 0.0291	**0.0490**	NA	**0.170**	**0.199**	**0.0435**	**0.0402**	**0.0149 J**	< 0.0291	**0.0203 J**	**0.0334**	**0.0161 J**	**0.0292**	< 0.0291	**0.0106 J**
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	< 0.429	< 0.429	< 0.129	< 0.129	< 0.129	NA	< 0.129	**0.885**	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129	< 0.129

Table B4: Data Summary Table - WWTP Primary and Secondary Solids

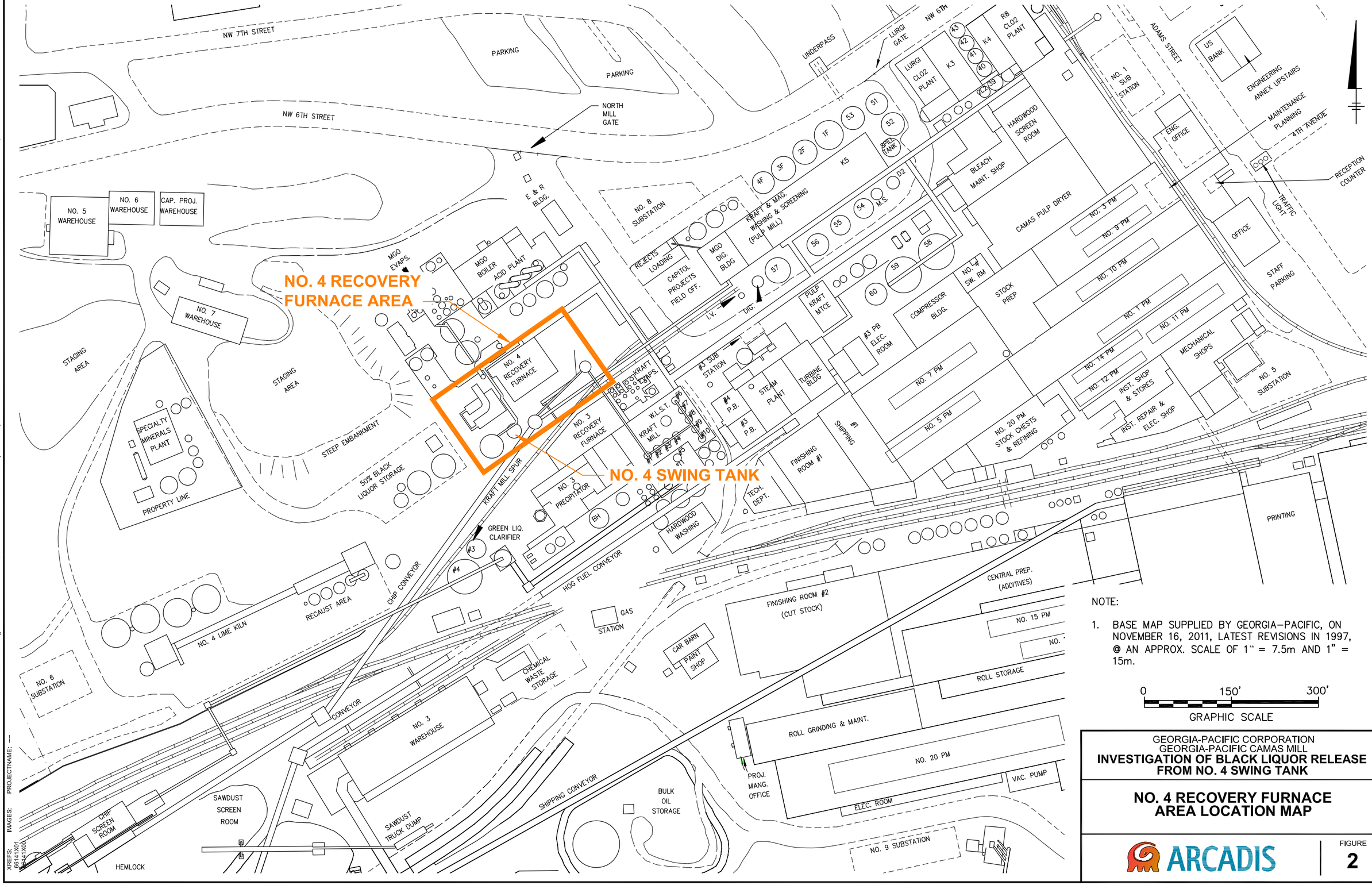
					Acute Toxicity (Ecology 80-12)		Physical Characteristics			Other Chemical Parameters							
OA	Sample ID	Sample Method or Type	Sample Depth	Sample Date	Percent Mortality [Concentration: 10 mg/L]	Percent Mortality [Concentration: 100 mg/L]	Total Solids	Total Volatile Solids	pH	Ignitability	Cyanide, WAD	Sulfur, Total	Nitrogen (TKN)	Cyanide	Cyanide (reactive) (c)	Sulfide	Sulfide (reactive) (c)
			ft bss	Units	%	%	%	%		°F	ppm	ppm	ppm	mg/kg	mg/kg	mg/kg	mg/kg
Primary Solids																	
D1	primary solids	Primary Solids	--	1/28/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12202016.2- primary solids	Primary Solids	--	12/20/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	4252018.0	Primary Solids	--	4/25/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	12172019	Primary solids	--	12/17/2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-S1-S4_20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	Camas-P1-N-W-20200312	Primary solids (composite)	--	03/12/2020	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary Solids																	
D1	secondary solids	Secondary Solids	--	8/12/2003	NA	**0**	NA	NA	**7.43**	**>200**	NA	NA	NA	NA	< 3.0	NA	**301**
D1	secondary solids cake	Secondary Solids	--	4/14/2005	NA	NA	**26.7**	NA	NA	NA	< 0.4	**55200**	**15200**	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	2/9/2006	NA	NA	NA	NA	**7.48**	NA	< 0.4	NA	NA	NA	NA	NA	< 8
D1	secondary solids	Secondary Solids	--	1/21/2008	NA	NA	**19.8**	**59.7**	**7.36**	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/28/2010	NA	NA	**16.9**	NA	**6.99**	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	6/2/2010	NA	NA	**16.8**	NA	**6.98**	NA	NA	NA	NA	NA	NA	NA	NA
D1	secondary solids	Secondary Solids	--	1/7/2010	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTHASB-C-01	Secondary Solids (composite)	--	08/16/2022	**0**	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	SOUTHASB-C-01	Secondary Solids (composite)	--	08/15/2022	**0**	**0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1	NORTH ASB-01 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	**7.77**	**25.4 J-**	**6.91 J**	**170**	NA	NA	NA	< 3.22	NA	**1370**	NA
D1	NORTH ASB-01 (3-6)	Secondary Solids	3 - 6	08/16/2022	NA	NA	**5.41**	**29.9 J-**	**6.49 J**	**170**	NA	NA	NA	**2.54 J**	NA	**1520**	NA
D1	NORTH ASB-01 (6-9.25)	Secondary Solids	6 - 9.2	08/16/2022	NA	NA	**37.5**	**11.4 J-**	**7.51 J**	**170**	NA	NA	NA	< 2.00	NA	**641**	NA
D1	NORTH ASB-02 (0-2.5)	Secondary Solids	0 - 2.5	08/16/2022	NA	NA	**13.3**	**18.2 J-**	**7.35 J**	**170**	NA	NA	NA	< 1.88 R	NA	**1900**	NA
D1	NORTH ASB-02 (2.5-5)	Secondary Solids	2.5 - 5	08/16/2022	NA	NA	**26.4**	**30.3 J-**	**7.14 J**	**170**	NA	NA	NA	**0.588 J**	NA	**1140**	NA
D1	NORTH ASB-03 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	**5.88**	**37.4 J-**	**7.40 J**	**170**	NA	NA	NA	< 4.25	NA	**1310**	NA
D1	DUP-01 (20220816)	Duplicate NORTH ASB-03	3 - 4.5	08/16/2022	NA	NA	**19.9**	**39.9 J-**	**7.66 J**	**170**	NA	NA	NA	**7.02 J**	NA	**1660 J**	NA
D1	NORTH ASB-03 (3-4.5)	Secondary Solids	3 - 4.5	08/16/2022	NA	NA	**22.4**	**37.6 J-**	**7.60 J**	**170**	NA	NA	NA	**33.8 J**	NA	**995 J**	NA
D1	NORTH ASB-04 (0-3)	Secondary Solids	0 - 3	08/16/2022	NA	NA	**3.46**	**45.1 J-**	**7.43 J**	**170**	NA	NA	NA	**2.18 J**	NA	**1910 J**	NA
D1	NORTH ASB-04 (3-5.75)	Secondary Solids	3 - 5.75	08/16/2022	NA	NA	**22.4**	**43.6 J-**	**7.48 J**	**170**	NA	NA	NA	**13.3**	NA	**894**	NA
D1	SOUTH ASB-01 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	**20.4**	**46.1 J-**	**7.24 J**	**170**	NA	NA	NA	**29.7**	NA	**688**	NA
D1	SOUTHASB-02 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	**24.0**	**42.8 J-**	**7.23 J**	**170**	NA	NA	NA	**23.7**	NA	**741**	NA
D1	SOUTH ASB-03 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	**20.6**	**44.4 J-**	**7.14 J**	**170**	NA	NA	NA	**9.79**	NA	**1020**	NA
D1	SOUTH ASB-04 (0-4')	Secondary Solids	0 - 4	08/15/2022	NA	NA	**4.67**	**51.5 J-**	**7.25 J**	**170**	NA	NA	NA	**7.05**	NA	**2840**	NA

Geosyntec consultants

APPENDIX C
Previous Investigation Well Logs

Appendix C1

Excerpt from: Arcadis. 2012. Data Summary Report Investigation of Black Liquor Release from No. 4 Swing Tank. Prepared for Georgia-Pacific Consumer Products LLC. October.



NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.

0 150' 300'

GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

INVESTIGATION OF BLACK LIQUOR RELEASE FROM NO. 4 SWING TANK

NO. 4 RECOVERY FURNACE AREA LOCATION MAP

ARCADIS

FIGURE 2

CITY:SYRACUSE_NY DIV/GROUP:ENV/CAD DB: T. RITSCHEL, K.SARTORI PIC:(Opt) PM:(Reqd) TM:R. SHATT LYR:(On/Off/Ref) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/1/2012 9:09 AM BY: SARTORI, KATHERINE
G:\ENV\CAD\SYRACUSE\ACTIVE\3006561411\000\100003\DWG\SWINGTANK\6561412G02.dwg LAYOUT: 2 SAVED: 6/1/2012 9:09 AM ACADVER: 18.1S (LMS TECH)
XREFS: IMAGES: PROJECTNAME: ---

NO. 4 R.F.
CONCENTRATOR

NO. 4
RECOVERY
FURNACE

NO. 4 R.F.
PRECIPITATOR

B1

B2

B3

NO. 4 SWING TANK

LEGEND:

B1 SOIL BORING LOCATION

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

INVESTIGATION OF BLACK LIQUOR RELEASE FROM NO. 4 SWING TANK

BORING LOCATION MAP

ARCADIS

FIGURE
3

CITY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(Opt)ON=*OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB0066141\000\100003\DWG\SWINGTANK66141G03.dwg LAYOUT: 3 SAVED: 6/6/2012 7:34 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/6/2012 7:34 AM BY: SARTORI, KATHERINE
XREFS:
66141X01
66141X00
IMAGES:
PROJECTNAME: ---

NO. 4 R.F.
CONCENTRATOR

NO. 4
RECOVERY
FURNACE

NO. 4 R.F.
PRECIPITATOR

B2
8.77

B1
DRY

NO. 4 SWING TANK

B3
8.15

LEGEND:

B1 — SOIL BORING LOCATION

8.77 — pH (STANDARD UNITS)
MEASURED 5/22/12

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'
GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL
INVESTIGATION OF BLACK LIQUOR RELEASE FROM NO. 4 SWING TANK

pH IN GROUNDWATER

ARCADIS

FIGURE
4

C:\TY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(Opt)ON=*OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB\06614\1000\10003\DWG\SWINGTANK\66141G04.dwg LAYOUT: 4 SAVED: 6/6/2012 7:34 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/6/2012 7:34 AM BY: SARTORI, KATHERINE
XREFS:
66141X01
66141X00
IMAGES:
PROJECTNAME: ---

NO. 4 R.F.
CONCENTRATOR

NO. 4
RECOVERY
FURNACE

NO. 4 R.F.
PRECIPITATOR

B2
1.11

B1
DRY

NO. 4 SWING TANK

B3
0.65

LEGEND:

B1 — SOIL BORING LOCATION

0.65 — CONDUCTIVITY (MILLISIEMENS PER CENTIMETER) MEASURED 5/22/12

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'
GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL
INVESTIGATION OF BLACK LIQUOR RELEASE FROM NO. 4 SWING TANK

CONDUCTIVITY IN GROUNDWATER

ARCADIS

FIGURE
5

CITY:(Read) DIV/GROUP:(Read) DB:(Read) LD:(Opt) PIC:(Opt) PM:(Read) TM:(Opt) LYR:(Opt)ON=*OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\66141\0001\00003\DWG\SWINGTANK66141G05.dwg LAYOUT: 5 SAVED: 6/6/2012 7:35 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 6/6/2012 7:35 AM BY: SARTORI, KATHERINE
XREFS:
66141X01
66141X00
IMAGES:
PROJECTNAME: ---

Date Start/Finish: 5/22/12
Drilling Company: Cascade Drilling
Driller's Name: Brooke King
Drilling Method: Geoprobe Direct Push
Sampling Method: 2-inch Macrocore
Rig Type: Geoprobe 7720DT

Northing: NA
Easting: NA
Casing Elevation: NA

Borehole Depth: 8.5' bgs
Surface Elevation: NA

Descriptions By: GRM

Well/Boring ID: **B-1**

Client: Georgia-Pacific Consumer Products (Camas), LLC

Location: Camas Mill, Camas Washington

DEPTH	PID (ppm)	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0.0				9.36		Asphalt	Top plugged with cold-patch asphalt.
	0.0				8.19		Fine to coarse GRAVEL, subround to subangular, little fine to coarse sand, subangular to angular, trace silt, wet, brown (fill).	
	0.0	1	0-4	HA*	7.76		SILT, low to medium plasticity, trace fine to medium sand, moist to wet, reddish brown.	
	0.0				7.79		CLAY, medium to high plasticity, trace fine to medium sand, moist, redish brown.	
	0.0				7.50		SILT, low plasticity, little fine to medium sand, moist to wet, orangish brown.	
5	0.0				7.71		SILT, low to medium plasticity, little fine to medium sand, little fine to medium gravel, subangular to angular, moist to wet, reddish brown.	Backfilled with bentonite chips.
	0.0	2	4-8.5	48/54	7.71		SAND and SILT, some Gravel-sized fragments of moderate to strongly cemented sand and silt, dry to moist, light brown, weathered bedrock (basalt and basaltic andesite).	
	0.0				7.64		Refusal at 8.5' bgs.	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet
*HA indicates soil sample collected from hand-auger cuttings.

Notes:
1) Material designated "fill" was consistently encountered immediately below asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically more angular than that encountered deeper in the borings.
2)Soil pH was measured using methods described in the Work Plan and Standard Operating Procedure (SOP) for measuring pH in soil and pH and conductivity in grab groundwater samples (ARCADIS 2011b).

Date Start/Finish: 5/22/12
Drilling Company: Cascade Drilling
Driller's Name: Brooke King
Drilling Method: Geoprobe Direct Push
Sampling Method: 2-inch Macrocore
Rig Type: Geoprobe 7720DT

Northing: NA
Easting: NA
Casing Elevation: NA

Borehole Depth: 6.0' bgs
Surface Elevation: NA

Descriptions By: GRM

Well/Boring ID: **B-2**

Client: Georgia-Pacific Consumer Products (Camas), LLC

Location: Camas Mill, Camas Washington

DEPTH	PID (ppm)	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0							Asphalt	Top plugged with cold-patch asphalt.
	0.0	1	1-3	HA*	9.65		SAND, subround, some Gravel, subround to subangular, little silt and clay, moist, olive gray (fill).	
	0.0				9.49		2.5' bgs - Concrete.	
	0.0				9.92		SAND, subround to subangular, some fine to medium Gravel, subround, trace silt and clay, wet, gray.	Backfilled with bentonite chips.
	0.0	2	3-5	6/24	9.71		SAND, subround to subangular, some fine to medium Gravel, subround to subangular, trace silt and clay, wet, gray.	
5							Perched water from 3.0 - 5.0' bgs.	
	0.0	3	5-6	6/12	9.52		SAND, subround to subangular, some fine to medium Gravel, subround, little silt and clay, moist, gray.	
							Highly weathered bedrock, dry (basalt and basaltic andesite). Refusal at 6.0' bgs.	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet
*HA indicates soil sample collected from hand-auger cuttings.

Notes:
1) Material designated "fill" was consistently encountered immediately below asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically more angular than that encountered deeper in the borings.
2)Soil pH was measured using methods described in the Work Plan and Standard Operating Procedure (SOP) for measuring pH in soil and pH and conductivity in grab groundwater samples (ARCADIS 2011b).

Date Start/Finish: 5/22/12
Drilling Company: Cascade Drilling
Driller's Name: Brooke King
Drilling Method: Geoprobe Direct Push
Sampling Method: 2-inch Macrocore
Rig Type: Geoprobe 7720DT

Northing: NA
Easting: NA
Casing Elevation: NA

Borehole Depth: 8.5' bgs
Surface Elevation: NA

Descriptions By: GRM

Well/Boring ID: **B-3**

Client: Georgia-Pacific Consumer Products (Camas), LLC

Location: Camas Mill, Camas Washington

DEPTH	PID (ppm)	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0.0				9.03		Asphalt	Top plugged with cold-patch asphalt.
	0.0	1	1-2.5	HA*	8.91		Medium to coarse GRAVEL, subangular to angular, little sand, subround to subangular, trace silt and clay, wet, brown (fill).	
							Fine to medium GRAVEL, subround to subangular, little sand, subround to subangular, trace silt and clay, wet, brown (fill).	
	0.0	2	2.5-5	14/30	9.28		Fine to medium GRAVEL, subangular to angular, little sand, subangular to angular, little silt, wet, dark gray to black (fill).	
5	0.0				9.43		GRAVEL, angular, some Sand, angular, trace silt, wet, dark gray to black, highly weathered bedrock (basalt).	Backfilled with bentonite chips.
	0.0	3	5-8.5	18/42	9.28		Refusal at 8.5' bgs.	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet
*HA indicates soil sample collected from hand-auger cuttings.

Notes:
1) Material designated "fill" was consistently encountered immediately below asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically more angular than that encountered deeper in the borings.
2)Soil pH was measured using methods described in the Work Plan and Standard Operating Procedure (SOP) for measuring pH in soil and pH and conductivity in grab groundwater samples (ARCADIS 2011b).

Appendix C2

Excerpt from: Arcadis. 2015. Data Summary Report Investigation of Black Liquor Basement Release. Prepared for Georgia-Pacific Consumer Products LLC. January.

KRAFT MILL BUILDING

SOURCE OF RELEASE

B1

B2

B3

LEGEND:

B1 SOIL BORING LOCATION

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.

0 150' 300'

GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

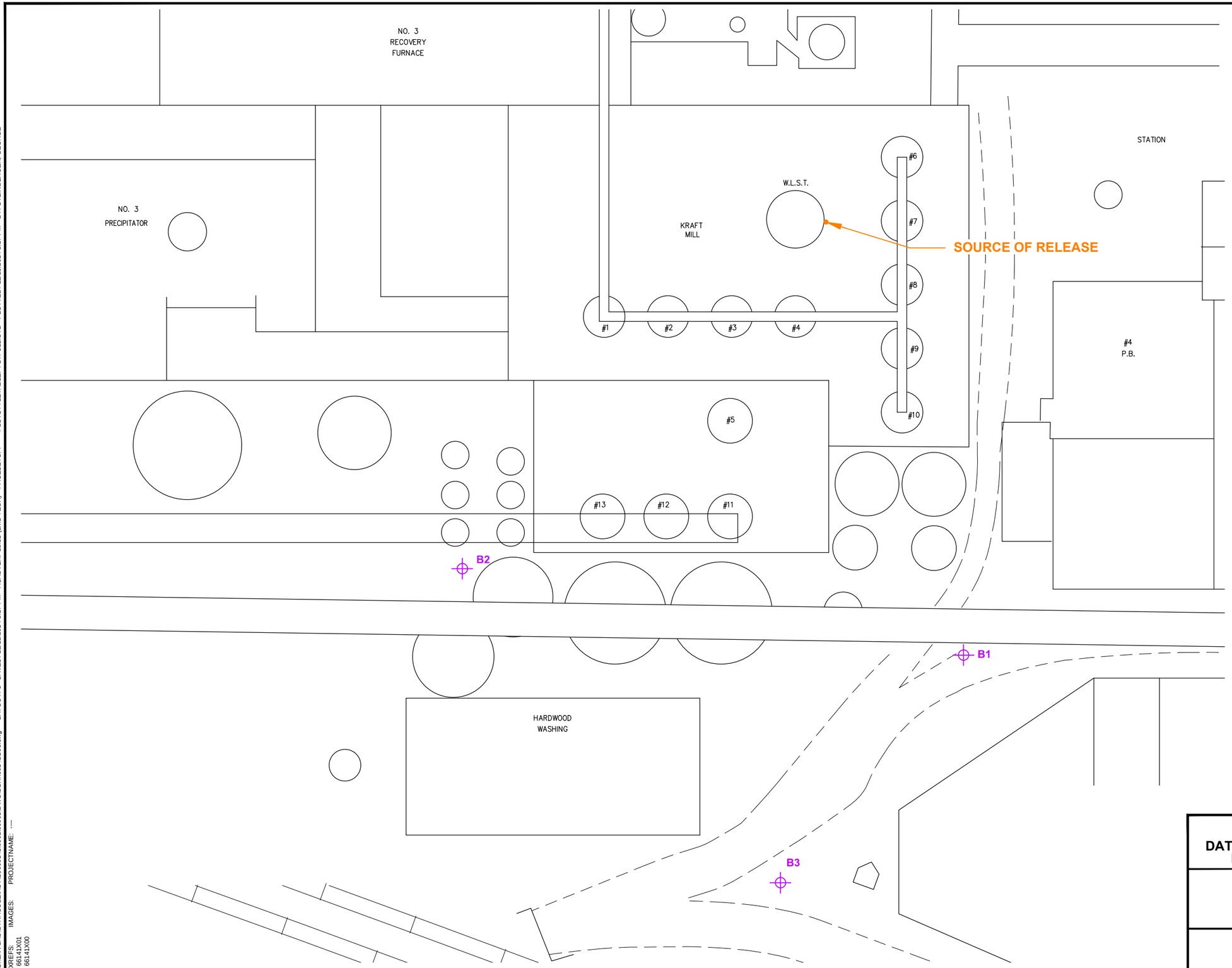
DATA SUMMARY REPORT INVESTIGATION OF BLACK LIQUOR BASEMENT RELEASE

KRAFT MILL BUILDING AREA LOCATION MAP

ARCADIS

FIGURE 2

CITY:SYRACUSE, NY DIV/GROUP:ENV/CAD DB: T. RITSCHEL, K.SARTORI PIC:(Opt) PM:(Reqd) TM:R. SHATT LYR:(Opt)ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACT\B0066141\000100003\DWG\DSR\66141G02.dwg LAYOUT: 2 SAVED: 12/15/2014 5:12 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/15/2014 5:13 PM BY: STEINBERGER, GEORGE
XREFS: 66141X01 66141X02 IMAGES: PROJECTNAME: ----



LEGEND:

B1 SOIL BORING LOCATION

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

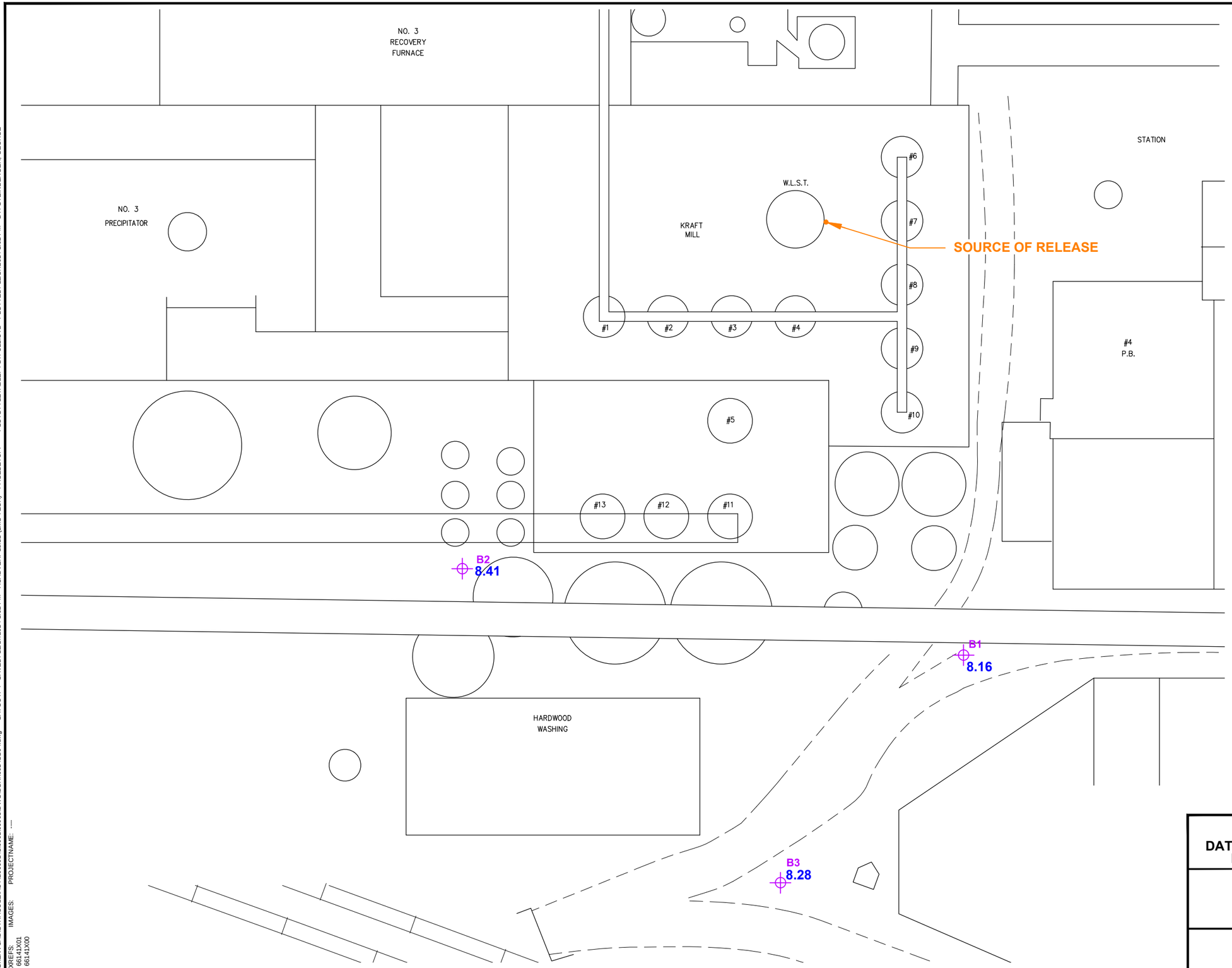
DATA SUMMARY REPORT INVESTIGATION OF BLACK LIQUOR BASEMENT RELEASE

BORING LOCATION MAP

ARCADIS

FIGURE 3

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B0066141\00010000\3DWG\DSRI\66141G03.dwg LAYOUT: 3 SAVED: 12/15/2014 5:17 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULLCTB PLOTTED: 12/15/2014 5:17 PM BY: STEINBERGER, GEORGE
XREFS:
66141X01
66141X00
IMAGES:
PROJECTNAME: ----



LEGEND:

B1 — SOIL BORING LOCATION

8.16 — pH (STANDARD UNITS)

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

DATA SUMMARY REPORT INVESTIGATION OF BLACK LIQUOR BASEMENT RELEASE

pH IN GROUNDWATER

ARCADIS

FIGURE
4

CITY:SYRACUSE-NY DIV/GROUP:ENVCAD DB:G.STEINBERGER LD:(Opt) PIC:(Opt) PM:(Reqd) TM:K.WILLIAMS LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\066141\00010000\DWG\DSR\I66141G04.dwg LAYOUT: 4 SAVED: 12/17/2014 1:02 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULLCTB PLOTTED: 12/17/2014 1:02 PM BY: STEINBERGER, GEORGE
XREFS: IMAGES: PROJECTNAME: ----
66141X01
66141X00

CITY:SYRACUSE-NY DIV/GROUP:ENVCAD DB:G.STEINBERGER LD:(Opt) PIC:(Opt) PM:(Reqd) TM:K.WILLIAMS LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIVE\B0066141\0001\00003\DWG\DSRI\66141G05.dwg LAYOUT: 5 SAVED: 12/17/2014 1:01 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: PLTFULLCTB PLOTTED: 12/17/2014 1:01 PM BY: STEINBERGER, GEORGE
XREFS: IMAGES: PROJECTNAME: ----
66141X01
66141X00

NO. 3
RECOVERY
FURNACE

NO. 3
PRECIPITATOR

KRAFT
MILL

W.L.S.T.

STATION

#4
P.B.

#1 #2 #3 #4 #5 #6 #7 #8 #9 #10 #11 #12 #13

SOURCE OF RELEASE

B2
1.93

B1
1.27

B3
1.23

HARDWOOD
WASHING

LEGEND:

B1 — SOIL BORING LOCATION

1.27 — CONDUCTIVITY (MILLISIEMENS PER CENTIMETER)

NOTE:

1. BASE MAP SUPPLIED BY GEORGIA–PACIFIC, ON NOVEMBER 16, 2011, LATEST REVISIONS IN 1997, @ AN APPROX. SCALE OF 1" = 7.5m AND 1" = 15m.
2. BORING LOCATIONS ARE APPROXIMATE.

0 30' 60'
GRAPHIC SCALE

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL

DATA SUMMARY REPORT INVESTIGATION OF BLACK LIQUOR BASEMENT RELEASE

CONDUCTIVITY IN GROUNDWATER

ARCADIS

FIGURE
5

Date Start/Finish: 12/4/2014
Excavation Company: Cascade Drilling, L.P.
Operator's Name: Kyle King
Equipment: Direct Push
Sampling Method: Grab Sample

Northing: Not Surveyed
Easting: Not Surveyed
Ground Surface Elev: Not Surveyed

Penetration Depth: 5.5 ft
Water Depth: 5 ft

Descriptions By: K. Williams

Boring ID: **B-1**

Client: Georgia-Pacific Consumer Producs (Camas) LLC

Location: Georgia-Pacific Camas Mill, Camas, Washington

DRAFT

DEPTH	ELEVATION	Odor	Staining	pH	Geologic Column	Stratigraphic Description
0	0					Concrete
				7.29		No Recovery
				7.26		Dark Brown GRAVEL with some Clay, wet.
5	-5	odor	sheen	7.40		Measured Water Depth
						End of Boring - Refusal at 5.5 feet

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: Weather: Heavy Rain. 45 degrees F

Date Start/Finish: 12/4/2014
Excavation Company: Cascade Drilling, L.P.
Operator's Name: Kyle King
Equipment: Direct Push
Sampling Method: Grab Sample

Northing: Not Surveyed
Easting: Not Surveyed
Ground Surface Elev: Not Surveyed

Penetration Depth: 9.2 ft
Water Depth: 4 ft

Descriptions By: K. Williams

Boring ID: **B-2**

Client: Georgia-Pacific Consumer Producs (Camas) LLC

Location: Georgia-Pacific Camas Mill, Camas, Washington

DRAFT

DEPTH	ELEVATION	Odor	Staining	pH	Geologic Column	Stratigraphic Description
0	0					Asphalt surface, no recovery
						Measured Water Depth
5	-5	None		8.77		Dark Gray CLAY with some silt and sand, moist
			Black	8.70		Black CLAY with some sand, wet
				8.31		
						End of Boring - Refusal at 9.2 feet

ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: Weather: Heavy Rain, 45 degrees F.

Date Start/Finish: 12/4/2014
Excavation Company: Cascade Drilling, L.P.
Operator's Name: Kyle King
Equipment: Direct Push
Sampling Method: Grab Sample

Northing: Not Surveyed
Easting: Not Surveyed
Ground Surface Elev: Not Surveyed

Penetration Depth: 14 ft
Water Depth: 7 ft

Descriptions By: K. Williams

Boring ID: **B-3**

Client: Georgia-Pacific Consumer Producs (Camas) LLC

Location: Georgia-Pacific Camas Mill, Camas, Washington

DRAFT

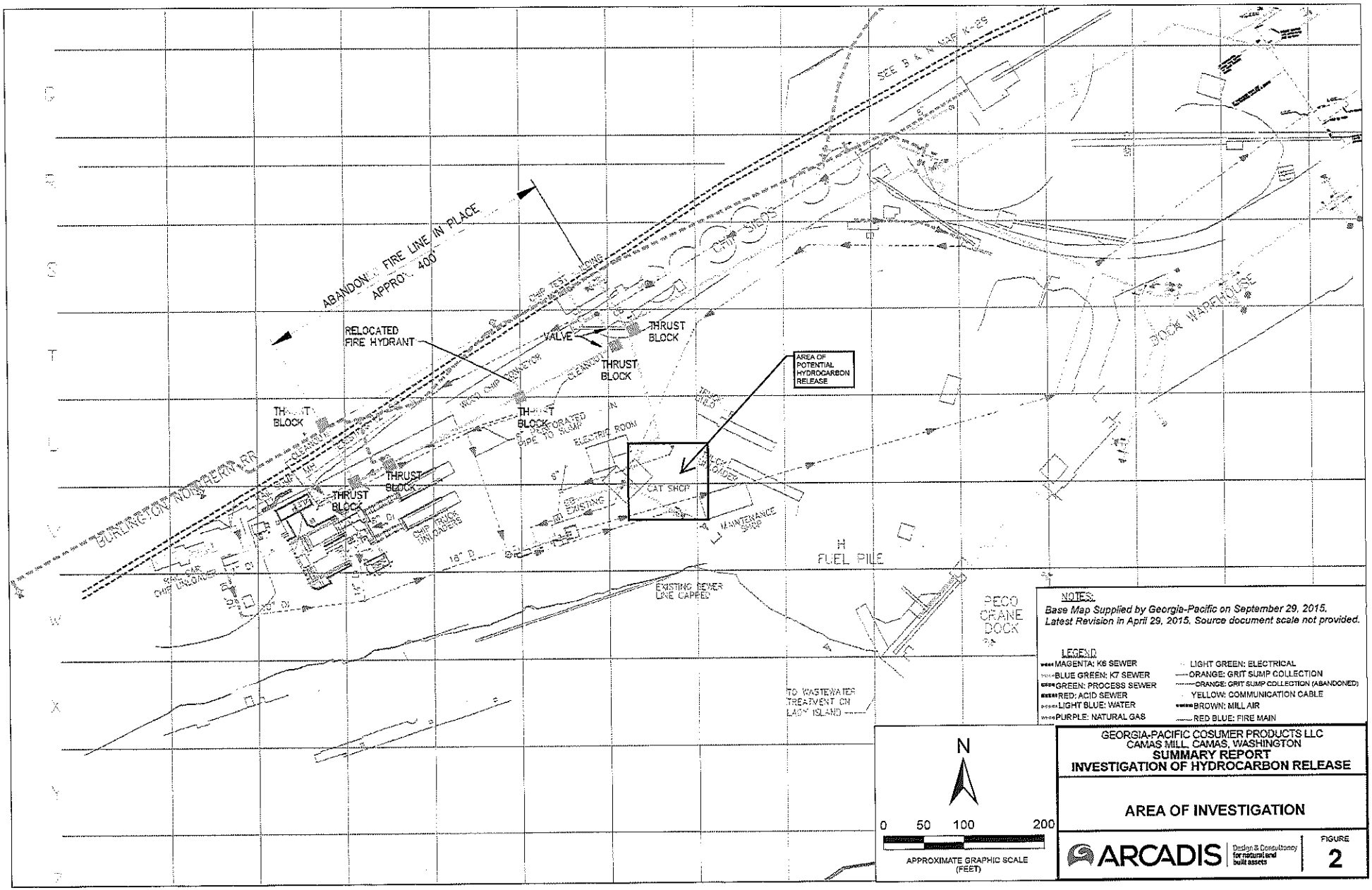
DEPTH	ELEVATION	Odor	Staining	pH	Geologic Column	Stratigraphic Description
0	0					
						Concrete
				10.82		Brown GRAVEL and SAND, moist
				9.18		Brown FILL (GRAVEL, SAND and some Silt), moist
				7.65		
				7.31		
5	-5			7.65		
						Minimal Recovery
						Measured Water Depth
				7.16		Dark Brown GRAVEL with some Clay, wet
				7.47		
10	-10			6.90		Dark Brown and Gray CLAY, wet
				7.50		Dark Brown GRAVEL with some Clay, wet
				7.10		Dark Brown CLAY with trace gravel, wet
		Slight Organic Odor	Sheen	7.09		
				7.15		End of Boring - Refusal at 14 feet
15	-15					

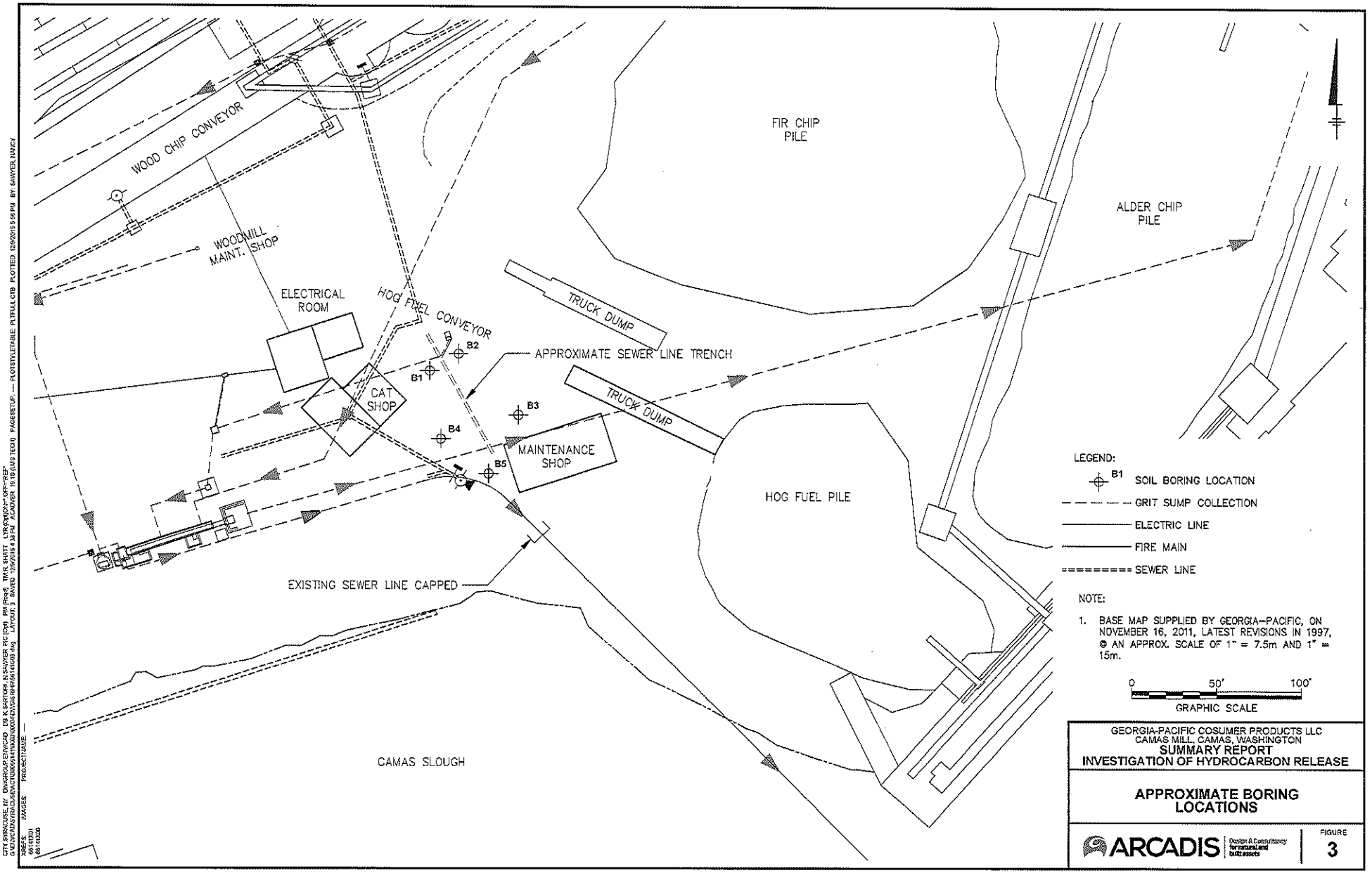
ARCADIS
Infrastructure · Water · Environment · Buildings

Remarks: Weather: Heavy Rain, 45 degrees F

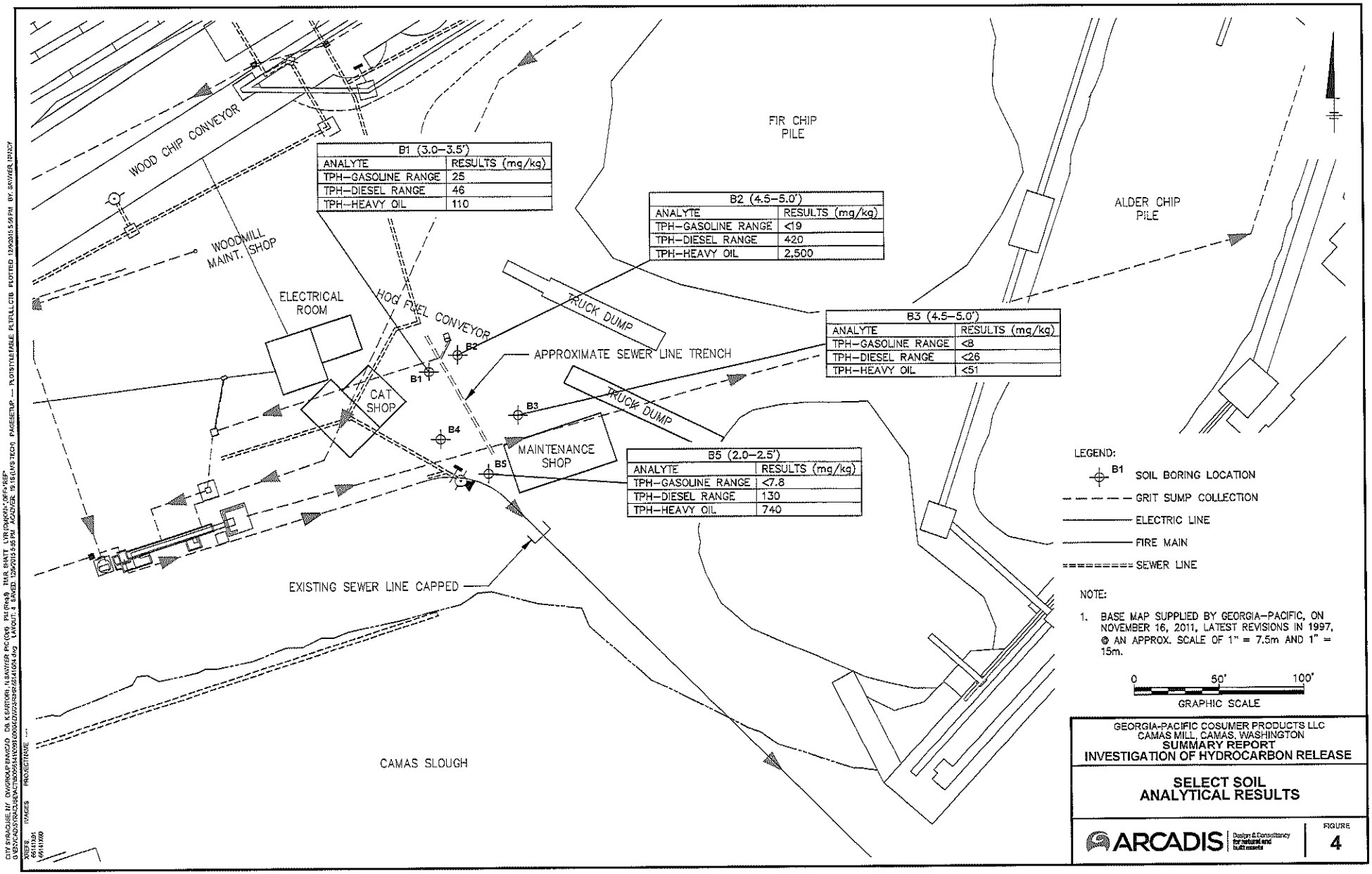
Appendix C3

Excerpt from: Arcadis. 2016. Summary Report Investigation of Hydrocarbon Release. Prepared for Georgia-Pacific Consumer Products LLC. January.


ABANDONED FIRE LINE IN PLACE APPROX. 400'
RELOCATED FIRE HYDRANT
VALVE
THRUST BLOCK
THRUST BLOCK
THRUST BLOCK
THRUST BLOCK
THRUST BLOCK
AREA OF POTENTIAL HYDROCARBON RELEASE
CHIP SHEDS
DOCK WAREHOUSE
CAT SHOP
MAINTENANCE SHOP
ELECTRIC ROOM
CHIP TRUCK UNLOADERS
RAIL CAR CHIP UNLOADER
EXISTING SEWER LINE CAPPED
FUEL PILE
PECO CRANE DOCK
TO WASTEWATER TREATMENT ON LADY ISLAND
BURLINGTON NORTHERN RR
SEE SHEET K-35
NOTES:
Base Map Supplied by Georgia-Pacific on September 29, 2015.
Latest Revision in April 29, 2015. Source document scale not provided.
LEGEND
MAGENTA: K6 SEWER
BLUE GREEN: K7 SEWER
GREEN: PROCESS SEWER
RED: ACID SEWER
LIGHT BLUE: WATER
PURPLE: NATURAL GAS
LIGHT GREEN: ELECTRICAL
ORANGE: GRIT SUMP COLLECTION
ORANGE: GRIT SUMP COLLECTION (ABANDONED)
YELLOW: COMMUNICATION CABLE
BROWN: MILL AIR
RED BLUE: FIRE MAIN
N
0 50 100 200
APPROXIMATE GRAPHIC SCALE (FEET)
GEORGIA-PACIFIC COSUMER PRODUCTS LLC
CAMAS MILL, CAMAS, WASHINGTON
SUMMARY REPORT
INVESTIGATION OF HYDROCARBON RELEASE
AREA OF INVESTIGATION
ARCADIS Design & Consultancy for natural and built assets
FIGURE 2



CITY SYRACUSE, NY, DWG:R:\P_ENVCAD_DB_K.SAWYER\K.SAWYER_RC\Dgn_PM (Proj)_TMP.S_SHATT_LWR(ORIGX=-OFF=REF)
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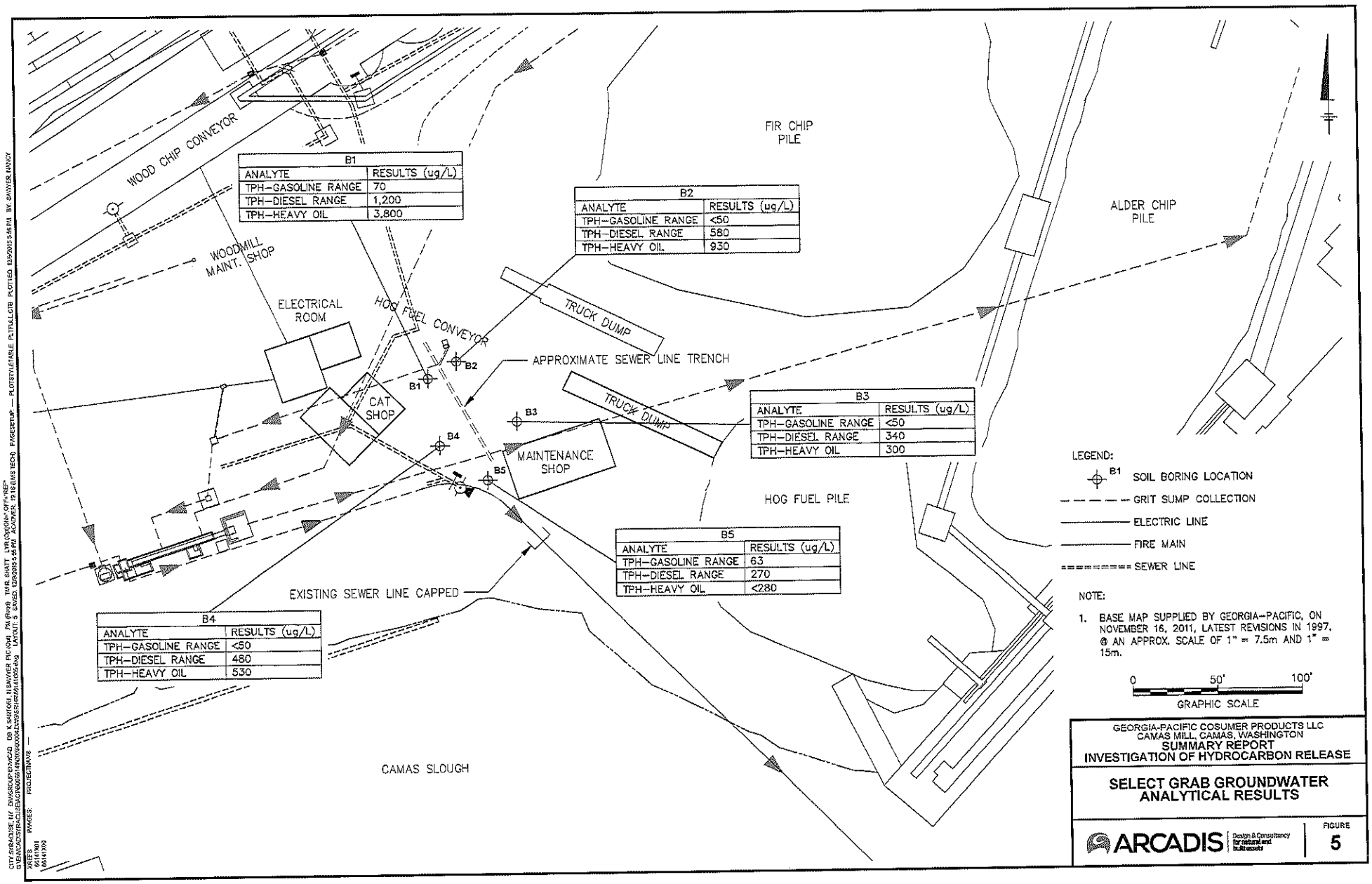
GEORGIA–PACIFIC COSUMER PRODUCTS LLC
CAMAS MILL, CAMAS, WASHINGTON
SUMMARY REPORT
INVESTIGATION OF HYDROCARBON RELEASE

SELECT SOIL ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY SYRACUSE NY DIVGROUP SYRCSD DB: K.SAWYER PIC:(Opt) PM:(Req'd) TM:R. SHATT LYR:(Opt)ON*;OFF*:REF*
G:\ENV\ACAD\TRACS\SDACT\60095541\WORK\DWG\SDACTR2R2514924.dwg LAYOUT: 4 SAVED: 12/9/2015 5:55 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: -- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/9/2015 5:56 PM BY: SAWYER, KACY
XREFS: IMAGES: PROJECTNAME: --
65141301
65141900



GEORGIA-PACIFIC COSUMER PRODUCTS LLC
CAMAS MILL, CAMAS, WASHINGTON

SUMMARY REPORT
INVESTIGATION OF HYDROCARBON RELEASE

SELECT GRAB GROUNDWATER ANALYTICAL RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY SYRACUSE, NY DWGGROUP ENVCAD DB K SAWYER PICKUP PM (Pmgt) TMPL SHEET LYR (OFF)=*;OFF*HEP
D:\ENVCAD\SYRACUSE\GTN0005141N0003000004ZHPSR\R0058141G06.dwg LAYOUT: 5 30X36 12/9/2015 5:58 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/9/2015 5:58 PM BY: SAWYER, NANCY
XREFS
PROJECTIONAVE: —
IMAGES
95141901
95141700

Date Start/Finish: 10/8/2015
Drilling Company: Stratus Corporation
Driller's Name: Lars Llungquist, Thomas Tipton
Drilling Method: Direct Push
Sampling Method: Macro Cores

Northing: Not Surveyed
Easting: Not Surveyed

Penetration Depth: 15 Feet
Water Depth: 7.33 Feet

Descriptions By: Christopher Kochiss

Boring ID: B1
Client: Georgia-Pacific Consumer Products LLC

Location: Camas Mill, Camas, Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
						ASPHALT/CONCRETE
						GRAVEL (subgrade). Refusal with hand auger at 1.8 feet
			60%	0.3		SAND and GRAVEL, poorly sorted, angular, dry, medium dense
	B-1	3.0 - 3.5'				
						WOOD CHIPS, moist
5				0.7		
						WOOD CHIPS, first water encountered at 6.3 feet
				0.2		
			70%			
10				0.0		WOOD CHIPS, wet
				0.1		
			100%			
				0.0		SILT, wet, very soft, dark gray, mottling of black, trace wood debris
15				0.0		

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Project: B0066141.0003.00002 Template:Sediment2015
Data File:Sediment2005.dat Date:12/10/2015 MKA

Date Start/Finish: 10/9/2015
Drilling Company: Stratus Corporation
Driller's Name: Lars Llungquist, Thomas Tipton
Drilling Method: Direct Push
Sampling Method: Macro Cores

Northing: Not Surveyed
Easting: Not Surveyed

Penetration Depth: 15 Feet
Water Depth: 6.53 Feet

Descriptions By: Christopher Kochiss

Boring ID: B2

Client: Georgia-Pacific Consumer Products LLC

Location: Camas Mill, Camas, Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
						ASPHALT/CONCRETE
						GRAVEL (subgrade). Refusal with hand auger at 0.5 feet
			80%			
						SAND and GRAVEL, angular, poorly sorted, moist, medium dense, gray
	B-2	4.5 - 5.0'				WOOD CHIPS, moist
5				0.2		WOOD CHIPS, first water encountered at 10 feet
				0.5		
			100%			
				0.2		
10						WOOD CHIPS, wet
				0.1		
			100%			
				0.0		
						SILTY SAND, fine to coarse sand, poorly sorted, moist medium dense, gray with black mottling, trace wood debris
				0.2		
15						

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Project: B0066141.0003.00002
Data File:Sediment2005.dat
Template:Sediment2015
Date:12/10/2015 MKA

Date Start/Finish: 10/8/2015
Drilling Company: Stratus Corporation
Driller's Name: Lars Llungquist, Thomas Tipton
Drilling Method: Direct Push
Sampling Method: Macro Cores

Northing: Not Surveyed
Easting: Not Surveyed

Penetration Depth: 15 Feet
Water Depth: 6.37 Feet

Descriptions By: Christopher Kochiss

Boring ID: B3
Client: Georgia-Pacific Consumer Products LLC

Location: Camas Mill, Camas, Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
						ASPHALT/CONCRETE. Refusal with hand auger at 1.8 feet
			70%			SAND and GRAVEL, dry, angular, poorly sorted, dense
5	B-3	4.5 - 5.0'		0.0		SAND and GRAVEL, dry, angular, poorly sorted, dense
			60%	0.1		WOOD CHIPS, moist
10				0.1		
			70%	0.1		WOOD CHIPS, moist, first water encountered at 13.5 feet
						GRAVEL, angular, some coarse sand, poorly sorted, wet, medium dense
15				0.5		SILT, wet, very soft, dark gray, mottling of black, trace wood debris

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Project: B0066141.0003.00002 Template:Sediment2015
Data File:Sediment2005.dat Date:12/10/2015 MKA

Date Start/Finish: 10/8/2015
Drilling Company: Stratus Corporation
Driller's Name: Lars Llungquist, Thomas Tipton
Drilling Method: Direct Push
Sampling Method: Macro Cores

Northing: Not Surveyed
Easting: Not Surveyed

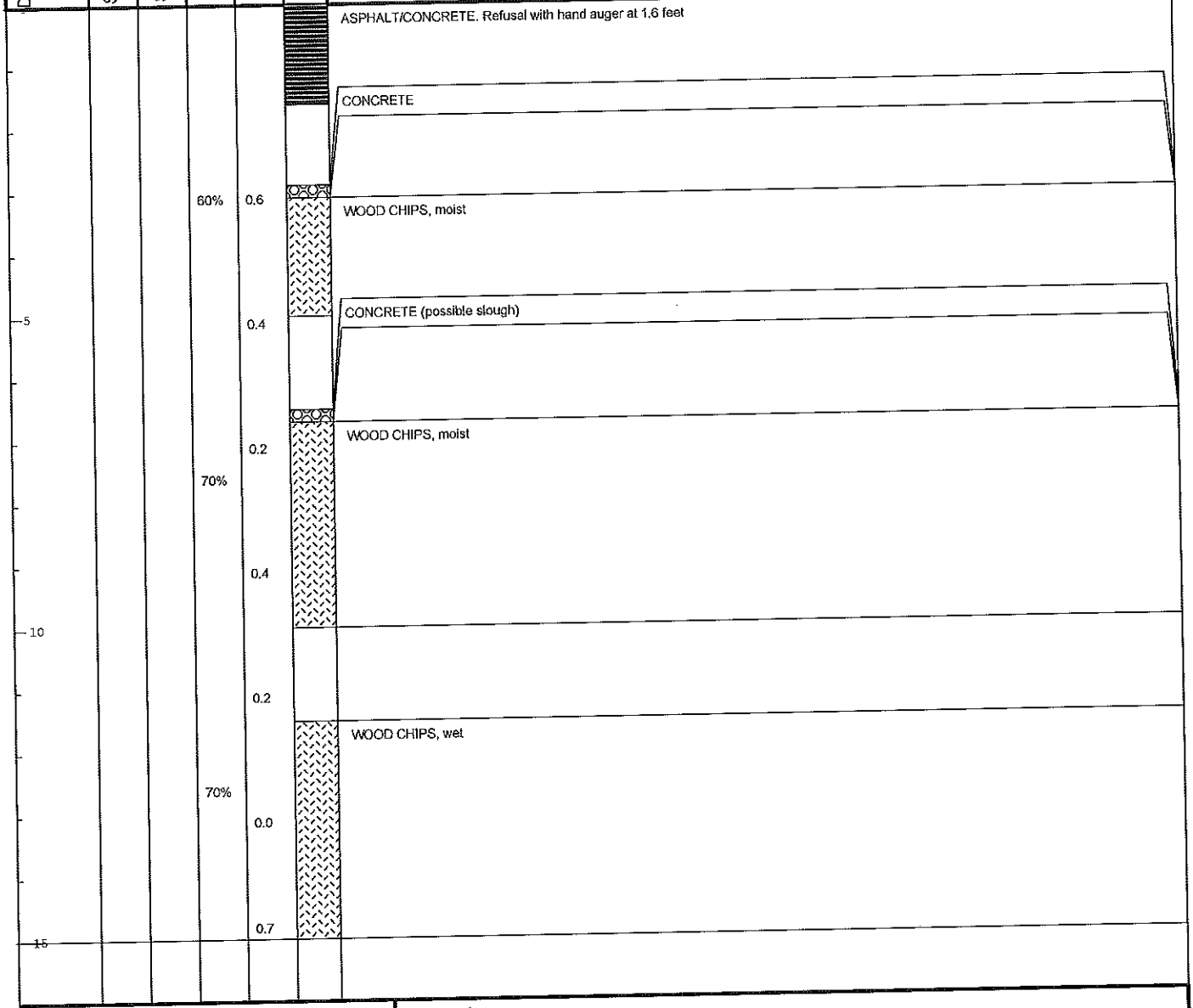
Penetration Depth: 15 Feet
Water Depth: 8.00 Feet

Descriptions By: Christopher Kochiss

Boring ID: **B4**

Client: Georgia-Pacific Consumer Products LLC

Location: Camas Mill, Camas, Washington



Remarks:

ARCADIS Design & Consultancy for natural and built assets

Project: B0066141.0003.00002 Template:Sediment2015
Data File:Sediment2005.dat Date:12/10/2015 MKA

Date Start/Finish: 10/9/2015
Drilling Company: Stratus Corporation
Driller's Name: Lars Llungquist, Thomas Tipton
Drilling Method: Direct Push
Sampling Method: Macro Cores

Northing: Not Surveyed
Easting: Not Surveyed

Penetration Depth: 20 Feet
Water Depth: 8.40 Feet

Descriptions By: Christopher Kochiss

Boring ID: B5

Client: Georgia-Pacific Consumer Products LLC

Location: Camas Mill, Camas, Washington

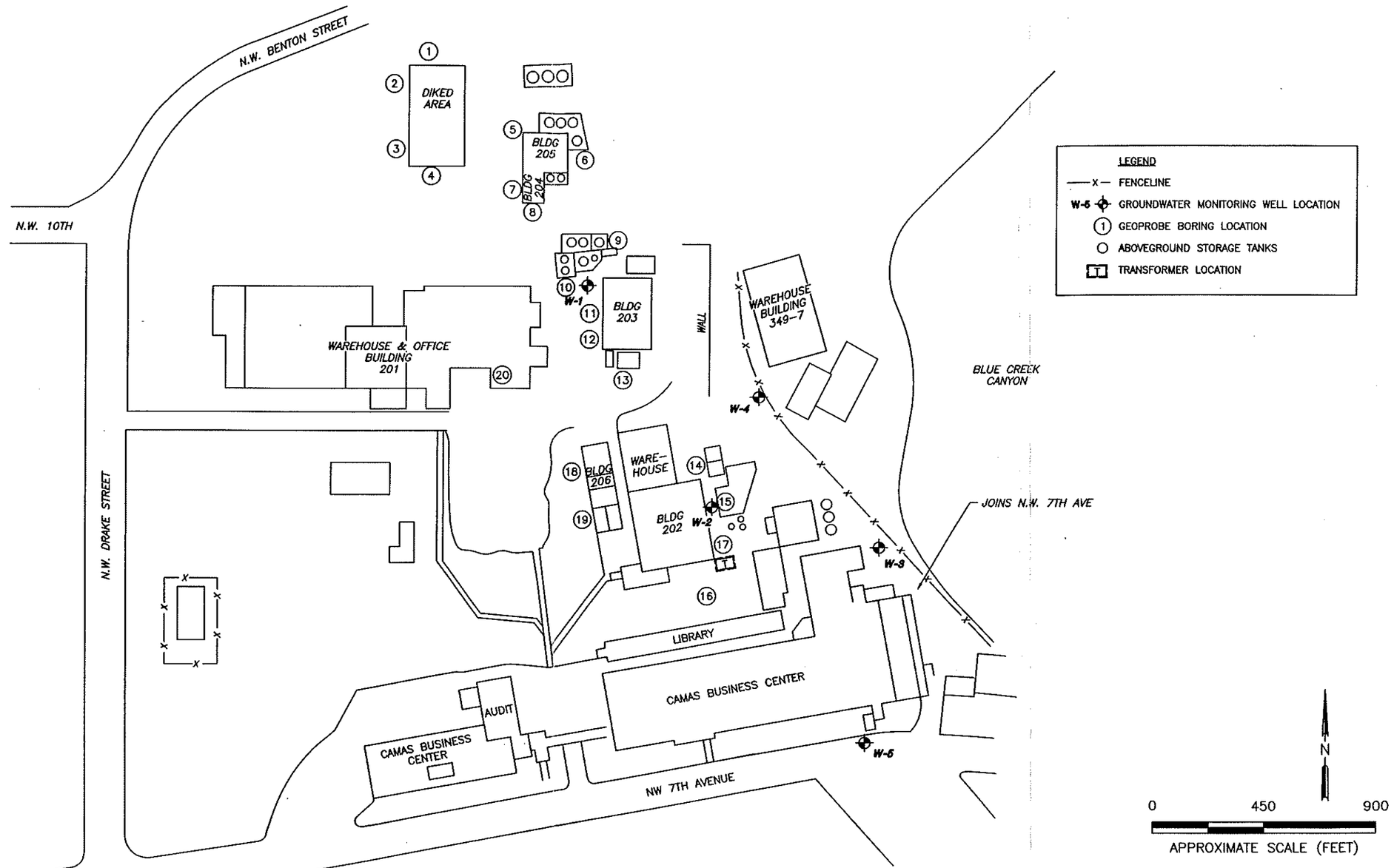
DEPTH	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Geologic Column	Stratigraphic Description
						WOOD CHIP, moist
						SAND and GRAVEL, poorly sorted, angular, medium dense, gravel 0.5 - 2 inches in diameter, moist, dark gray
	B-5	2.0 - 5.0'		0.3		SAND and GRAVEL, poorly sorted, angular, medium dense, gravel 0.5 - 2 inches in diameter, moist, dark gray
			0%			
				0.3		WOOD CHIPS, moist. Hand cleared with vacuum truck to 5 feet
5						
			40%			
				0.2		WOOD CHIPS, moist
10				0.4		
			20%			
						WOOD CHIPS, moist, silty sand at 15 feet
15				0.5		
						SILTY SAND, well sorted, fine to medium grained, loose, wet, gray, trace wood chips
				0.3		
						Increasing silt content at 20 feet
20				0.1		

Remarks:

ARCADIS Design & Consultancy for natural and built assets

Appendix C4

Excerpt from: SECOR. 2001. 2000 Site Investigation Report – Former Fort James Specialty Chemicals. 17 January.



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015

SOIL AND GROUNDWATER SAMPLING LOCATIONS
FORT JAMES CORPORATION
SPECIALTY CHEMICALS
CAMAS, WASHINGTON

FIGURE: **3**

JOB#: **015.08860.003** APPR: KPM DWN: **KPM** DATE: **12/06/00**

F:/FILES/PORTLAND/FORT JAMES

DWG: 15-8860-0033SP

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-1**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0809 08/01/00** FINISH **0819 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Grass		0	
		0.0		0	Gravelly SAND, orange, gravel is fine to very coarse, sand is fine grained, loose, dry	SP	0	
				2.5	Boring terminated at 2.5 feet (refusal). (GP1B – refusal @ 3.5' bgs.) (GP1C – refusal @ 3.2' bgs.)			
				5			5	
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-2**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0831 08/01/00** FINISH **0835 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Grass		0	
	0-3.5	2.9		0	SAND w/ gravel, orange/tan, gravel is fine to coarse, sand is fine to medium grained, trace silt, loose, dry	SP	0	
				5	Boring terminated at 3.5 feet (refusal).		5	
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-2B**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1700 08/02/00** FINISH **1717 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results BLOWS 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Grass		0	
					No recovery in sampler			
		0.0		5	Silt, SAND, gravel aggregate, gravels are fine to coarse, sand is fine–to medium–grained, mottled color, dense, dry	GM	5	
					Boring terminated at 7.5 feet (refusal).			
					(GP2C – refusal @ 4.3' bgs)			
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-3**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0845 08/01/00** FINISH **0900 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	Grass		0	
		0.9			SAND, orange/tan, fine-to medium-grained, few gravels, root debris present, loose, dry	SP		
		1.4		5	SAND and silt, green/gray, fine grained, firm, dry	SM	5	
		0.3			Becomes damp			
		2.1			SILT, dark brown, root debris, firm, damp			
		9.7		10	Becomes wet	ML	10	
		21.0			Color changes to brown/tan			
		8.0			Gravel present at base of sampler			
				15	Boring terminated at 14 feet (refusal).		15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

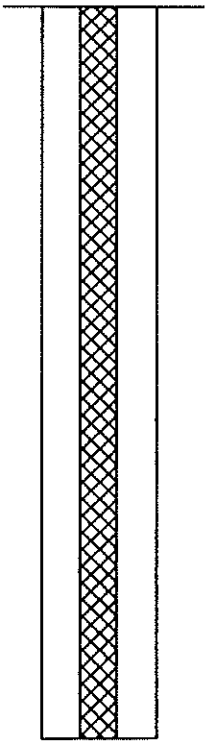
DWG: 15-8716-3L

SECOR
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FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-4**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0915 08/01/00** FINISH **0945 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet
				5			5
				0	Grass		0
		1.5			SAND and silt, tan, sand is fine grained, firm, dry	SM	
		3.1			SILT, gray, root debris present, firm, damp	ML	
		1.4		5	Sandy SILT, green/gray, sand is fine grained, trace small gravels, firm, damp		5
		1.2				SM	
		1.2		10	Silty SAND, dark brown, sand is fine grained, trace small gravel, root debris present, firm, damp		10
		0.6					
		1.1			SILT, sand, gravel aggragate, dark brown, gravels are fine to medium, sand is fine to medium, a lot of root debris, loose, wet	GM	
				15			15
		1.1			SILT, gray/green, firm, damp	ML	
		1.2			Silty SAND w/gravel, mottled, gravels are fine to medium, sand is fine to medium, dense, damp	GM	
		1.7					
					Boring terminated at 19 feet (refusal).		
				20			20
				25			25

Well Construction Schematic



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-5**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0956 08/01/00** FINISH **1022 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
		1.3		0	Silty SAND, gravel, cobble aggregate, brown, brick debris present, dense, dry	GM	0	
				5	Boring terminated at 4.5 feet (refusal). (GP5B – refusal @ 2.0' bgs) (GP5C – refusal @ 5.6' bgs)		5	
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

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FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-6**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1257 08/01/00** FINISH **1318 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet
				0	Asphalt surface		0
		1.9		5	Silt, SAND, gravel aggregate, brown, medium dense, dry	GM	5
		1.6		10	SAND and silt, brown, sand is fine-to medium-grained, trace gravel, loose, soft (no good recovery in sampler)	SM	10
				15	SILT, brown, damp, firm	ML	15
		1.6			SILT w/ sand and gravel, gravels are fine to coarse, sand is fine, medium dense, damp	GM	
		0.7			Boring terminated at 17.5 feet (refusal).		
				20			20
				25			25

Well Construction Schematic

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-7**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1035 08/01/00** FINISH **1041 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
		2.6		0	Silt, SAND, gravel, cobble aggregate, brown, loose, dry	GM	0	
				3	Boring terminated at 3 feet (refusal).			

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slot
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-7B**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1241 08/01/00** FINISH **1347 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
	0			0	Asphalt surface		0	
	0 - 2.5	0.5		0	Silt, SAND, gravel, cobble aggregate, brown, loose, dry	GM	0	
				2.5	Boring terminated at 2.5 feet (refusal).			

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-7C**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1355 08/01/00** FINISH **1403 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
	0-5	1.2		5	Silt, SAND, gravel, cobble aggragate, brown, medium dense, dry	GM	5	
					Boring terminated at 6 feet (refusal).			
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

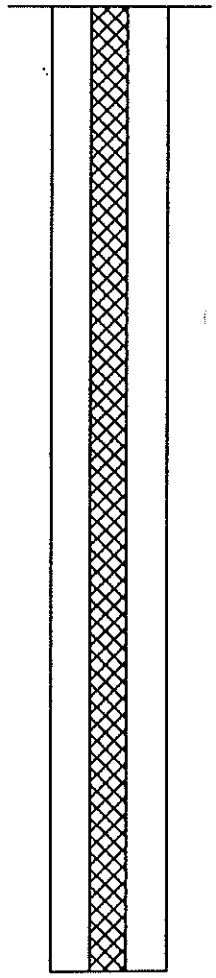
DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-8**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1050 08/01/00** FINISH **1150 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet
				5			5
				0	Asphalt surface		0
		2.5			SILT w/ sand and gravels, dark brown, gravels are fine to coarse, sand is fine grained, root debris present, firm, damp	GM	
				5			5
		2.4			Silty SAND, orange/tan, sand is fine to medium, loose, dry	SM	
					SILT w/ trace small gravels	ML	
		0.0		10	SAND and silt, brown, sand is fine-to medium-grained, loose, dry		10
				15			15
		0.6			Cobbles at base of sampler	SM	
		1.0		20	Very dense and hard - no cobbles		20
		1.7			SAND w/ silt and gravels, mottled orange, sand is fine-to medium-grained, very dense, hard	GM	
				25			25

Well Construction Schematic



Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY FT JAMES SPECIALTY CHEMICAL JOB # 015.08716.003 BORING/WELL GP-8
LOCATION CAMAS, WASHINGTON SURFACE ELEVATION NA
START 1050 08/01/00 FINISH 1150 08/01/00 CASING TOP ELEVATION NA
LOGGED BY DEC MONITORING DEVICE Mini RAE 2000 w/ 100 ppm Isobutylene
SUBCONTRACTOR AND EQUIPMENT Geotech Geoprobe rig utilizing a 4' macrosampler lined
COMMENTS w/ acrylic sleeve

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
		0.4		25		GC	25	
		0.5		30	Clayey, gravelly, SILT, orange/brown, firm, moist		30	
					Boring terminated at 31.5 feet (refusal).			
				35			35	
				40			40	
				45			45	
				50			50	
				55			55	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-9**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1420 08/01/00** FINISH **1500 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	Asphalt surface		0	
		0.0		5	Gravelly SILT w/ sand, brown, gravels are fine to coarse, sand is fine-to medium-grained, medium dense, wet		5	
		24.2		10	Silty SAND w/ gravels, tan/brown, gravel is fine to medium, sand is fine to medium, medium dense, damp	GM	10	
		30.1		15			15	
		14.8		20	Sandy SILT w/gravel, brown, wet		20	
		1.4		25			25	
		0.9						

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-9**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1420 08/01/00** FINISH **1500 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
		0.8		25	Gravelly SAND, brown, gravel is fine to coarse, sand is fine to coarse, trace silt, medium dense, moist	GM	25	
				30	Boring terminated at 27.5 feet (refusal).		30	
				35			35	
				40			40	
				45			45	
				50			50	
				55			55	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-10**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1520 08/01/00** FINISH **1543 08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
		0.5		5	Silty SAND and gravel, mottled brown, gravels are fine to coarse, sand is fine to medium, dense, dry	GM	5	
		1.1			Sand grades coarser			
		0.5		10	Same w/ cobbles present		10	
		0.0		15	Sandy, silty GRAVELS w/cobbles, brown, gravels are fine to coarse, sand is fine to coarse, loose, dry		15	
		0.4		20	Clayey, gravelly SILT, brown, gravels are fine to coarse, trace fine sand, firm, wet		20	
					Boring terminated at 21.5 feet (refusal).			
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-11**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1600 08/01/00** FINISH **08/01/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
		0.5		5	Silty SAND, brown, sand is medium grained, few gravels fine to medium, loose, dry	SM	5	
					No recovery (4–8' bgs)			
				10	Silty, sandy, GRAVEL, brown, gravel is medium to coarse, sand is fine, loose, dry	GM	10	
					Boring terminated at 10.5 feet (refusal).			
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-12**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0745 08/02/00** FINISH **0815 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
		0.9		5	Gravelly SAND, gray, sand is fine to medium, loose, dry	GM	5	
		1.0			SILT, dark brown, trace fine sand, wood debris present, firm, dry	ML		
		0.9		10	SILT w/sand and gravel in varying quantities, multicolored, damp	SM	10	
		1.0			SILT, brown, trace small to medium gravels, firm, damp	ML		
				15	SILT w/ gravels, brown, gravel is fine to coarse, firm/dense, damp	GM	15	
					Boring terminated at 14.5 feet (refusal).			
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-13**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0830 08/02/00** FINISH **0848 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt surface		0	
					SILT, brown, some gravels and cobbles, gravels are fine to coarse, trace fine sand, soft, damp	ML		
		0.0		5	GRAVEL w/sand, gray, gravels are fine to coarse, sand is fine to medium, loose, dry	SW	5	
					Boring terminated at 6.5 feet (refusal). (GP13B – refusal @ 6.5' bgs) (GP13C – refusal @ 6.3' bgs)			
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-14**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0923 08/02/00** FINISH **0955 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	Asphalt surface		0	
		22.8			Clayey SILT, brown, trace medium gravels, firm, damp	ML		
				5	SILT and gravels, gray, gravels are medium to coarse, dense/ firm, dry	GM	5	
		25.4			SILT, dark gray, very stiff, dry	ML		
					Boring terminated at 8 feet (refusal).			
				10	(GP14B – refusal @ 7.0' bgs) (GP14C – refusal @ 7.0' bgs)		10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-15**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1400 08/02/00** FINISH **1420 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Concrete surface		0	
		1.8			Brick debris SILT w/gravel, dark brown, gravels are fine to medium, root debris present, medium dense, damp	GM		
		0.8		5	SILT, oxidized red/brown, trace gravels, hard, dry	ML	5	
				10	Boring terminated at 7.5 feet (refusal). (GP15B – refusal @ 7.5' bgs) (GP15C – refusal @ 6.7' bgs)		10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-16**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0800 08/03/00** FINISH **0810 08/03/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	Grass		0	
		0.7			Gravelly SILT, brown, gravels are fine to medium, loose, dry	GM		
					Boring terminated at 2.7 feet (refusal).			
					(GP16B – refusal @ 2.5' bgs) (GP16C – refusal @ 2.5' bgs)			
				5			5	
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-17**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1015 08/02/00** FINISH **1035 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				5			5	
				0	Concrete surface w/ fiberglass		0	
		82.8			SILT and gravel, brown, gravels are fine to coarse, odor present, medium dense/firm, damp	GM		
		792		5			5	
		7.0			SILT, sand, and gravel, brown/gray, gravel is fine to coarse, sand is fine to medium, strong odor present, medium dense, damp			
				10	Boring terminated at 9 feet (refusal). (GP17B – refusal @ 7.5' bgs)		10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08718.003** BORING/WELL **GP-17C**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **1115 08/02/00** FINISH **1150 08/02/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Asphalt/fiberglass surface		0	
		1.2		5	SILT, sand and gravel, brown/gray, gravel is fine to coarse, sand is fine to medium, no odor, medium dense, damp	GM	5	
		17.1		10	Zeolite present SILT, black, some small gravels, hard, dry	ML	10	
				11.5	Boring terminated at 11.5 feet (refusal). (GP17B – refusal @ 7.5' bgs)			
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8718-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-18**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **08/03/00** FINISH **08/03/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results (Blows 6"/6"/6")	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Basalt		0	
		1.0		0	Sand, SILT w/gravel, loose, damp	GM	0	
				1.5	Boring terminated at 1.5 feet (refusal). (GP18B – refusal @ 1.5' bgs) (GP18C – refusal @ 1.5' bgs)			

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-19**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **08/03/00** FINISH **08/03/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Basalt		0	
		0.6		0	Sandy SILT w/gravel, loose, damp	GM	0	
					Boring terminated at 1 feet (refusal).			
					(GP19B – refusal @ 1.0' bgs) (GP19C – refusal @ 1.0' bgs)			

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis

Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts

Gradational Contact
Contact Located Approximately
Contact

Concrete
Bentonite

10/20 Colorado Silica Sand

2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

SECOR
International Incorporated

FACILITY **FT JAMES SPECIALTY CHEMICAL** JOB # **015.08716.003** BORING/WELL **GP-20**
LOCATION **CAMAS, WASHINGTON** SURFACE ELEVATION **NA**
START **0945 08/03/00** FINISH **1000 08/03/00** CASING TOP ELEVATION **NA**
LOGGED BY **DEC** MONITORING DEVICE **Mini RAE 2000 w/ 100 ppm Isobutylene**
SUBCONTRACTOR AND EQUIPMENT **Geotech Geoprobe rig utilizing a 4' macrosampler lined**
COMMENTS **w/ acrylic sleeve**

Penetration Results: Blows 6"/6"/6"	Sample Depth Interval, feet	PID Reading	Sheen	Depth Below Surface, feet	Lithologic Description	Unified Soil Classification	Depth Below Surface, feet	Well Construction Schematic
				0	Planter rocks over fabric screen		0	
		0.7		0	SILT, brown, trace small gravel, some organic debris, loose, dry	ML	0	
				5	Boring terminated at 6 feet (refusal). (GP20B – refusal @ 5.5' bgs) (GP20C – refusal @ 2.5' bgs)		5	
				10			10	
				15			15	
				20			20	
				25			25	

Field Screen/Lithologic Description Sample
Preserved Sample
No Recovery
* Sample Submitted for Laboratory Analysis
Groundwater Level at Time of Drilling
Static Groundwater Level
SD Sheen Detected
NS No Sheen Detected
NT Not Tested
(2.5Y 4/2) Munsell (1990) Soil Color Charts
Gradational Contact
Contact Located Approximately
Contact
Concrete
Bentonite
10/20 Colorado Silica Sand
2" PVC Blank Casing
2" PVC Screen Casing (0.010 slots)
End Cap

DWG: 15-8716-3L

Appendix C5

Excerpt from: BergerABAM. 2016. Phase II Environmental Site Assessment, Clark County Tax Parcel 82920000, Camas, Washington. Prepared for the City of Camas. August.

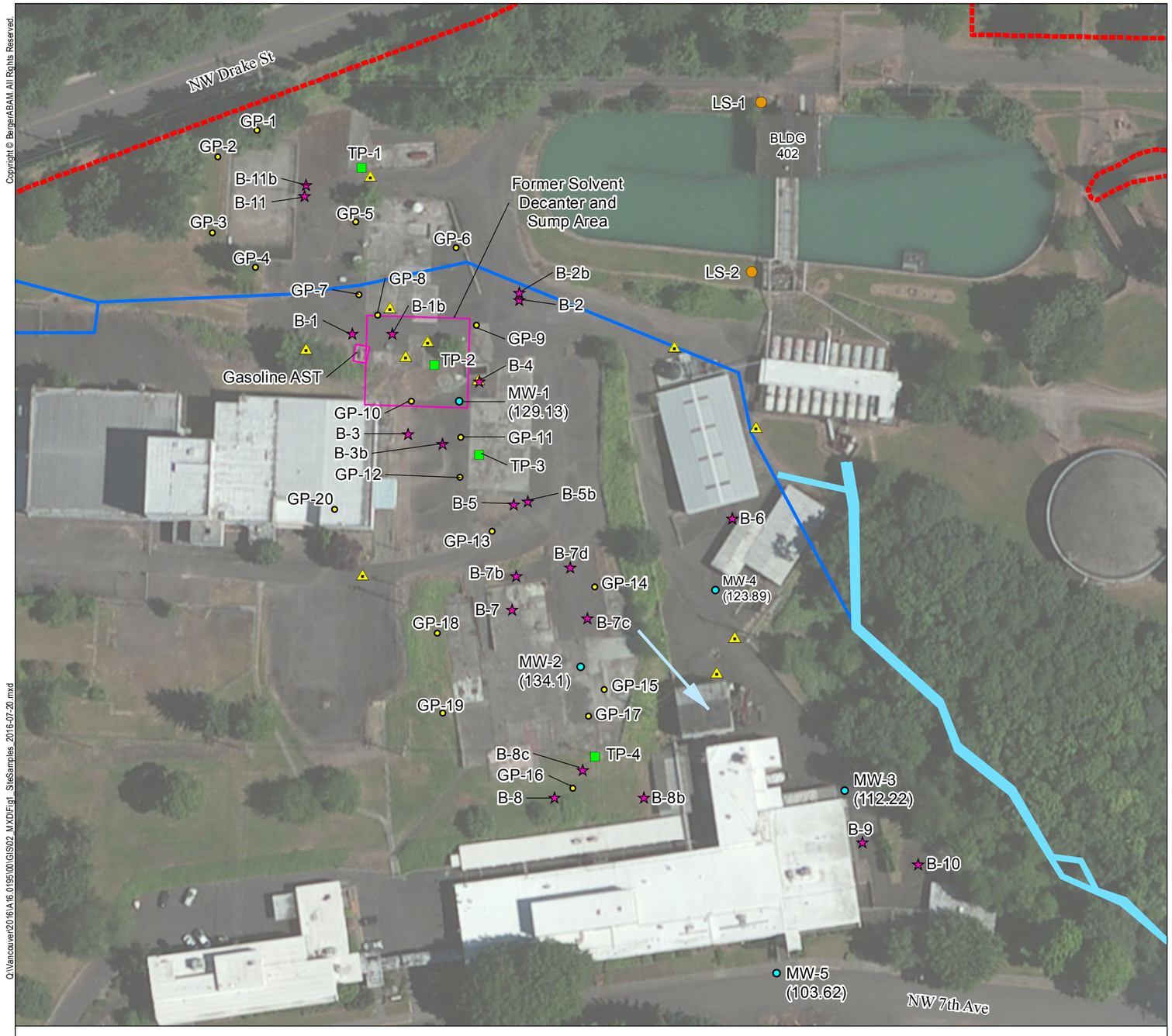


Figure 2 - Sample Locations and Groundwater Data For Chlorinated VOCs

Former Fort James Specialty Chemicals
Phase II ESA
Camas, Washington

Sample ID	Sample Date	Volatile Organic Compounds (µg/L)				
		PCE	TCE	1,1,1-trichloroethane	1,1-dichloroethene	cis-1,2-DCE
Monitoring Wells						
MW-1	8/25/2000	**23.6**	<1.0	<1.0	--	**2.39**
	7/19/2016	**2.00**	<1.00	**8.32**	**4.54**	<1.00
MW-2	8/25/2000	**2.32**	<1.0	**2.71**	--	<1.0
	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00
MW-3	8/25/2000	<1.0	**17.5**	<1.0	--	<1.0
	7/19/2016	<1.00	**6.23**	<1.00	**1.19**	<1.00
MW-4	11/10/2000	<1.0	<1.0	<1.0	--	<1.0
	7/19/2016	<1.00	<1.00	<1.00	<1.00	<1.00
MW-5	11/10/2000	<1.0	<1.0	<1.0	--	<1.0
	7/20/2016	<1.00	**1.25**	<1.00	<1.00	<1.00
Grab Sample						
B-6(GW)	7/20/2016	<1.00	<1.00	<1.00	<1.00	<1.00
MTCA Cleanup Levels		5[4]	5[4]	200[4]	400[5]	16[5]

Notes:

MTCA = Washington State Model Toxics Control Act

-- = not analyzed or not reported

µg/L = micrograms per liter

PCE = Tetrachloroethene

TCE = Trichloroethene

cis-1,2-DCE = cis-1,2-dichloroethene

Bold = indicates the analyte was detected at a concentration greater than the laboratory method reporting limit

<1.00 = The analyte was not detected. The associated numerical value is the sample quantitation limit.

Blue shading indicates the reported concentration exceeds the MTCA Method A CUL

Legend

- B-1 — Geoprobe samples (BergerABAM, July 2016)
- LS-1 — Surface soil sample (BergerABAM, July 2016)
- GP-9 — Geoprobe (Secor, 2000)
- TP-3 — Test Pit (Georgia Pacific, 2002)
- MW-1 (129.13) — Monitoring Well (Ground Water Elevation in Feet Below Top of Casing)
- Storm Drain
- Storm Water
- Assumed Groundwater Gradient
- City Storm Water Line
- Project Site

BergerABAM
33301 9th Ave S, Suite 300
Federal Way, WA 98003
Telephone: 206-431-2000
Fax: 206-431-2250

BORING NUMBER B-1

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0						
	SS 1	NS Sample B-1(1')			0.5 6" Asphalt layer (SM) Dark brown sandy silt with gravel (moist) no odor	PID = 2.9
		NS				PID = 3.5
5		NS				PID = 2.7
		NS				PID = 1.9
		NS				PID = 3.6
10						PID = 3.4
		NS				PID = 2.6
	SS 2	Sample B-1(13')	SM			
15		NS				PID = 3.6 PID = 3.4
		NS				PID = 8
						PID = 7.6
20		NS				
		NS			Becomes reddish brown sandy silt with gravel (moist) no odor	PID = 7.5 PID = 8
		NS				PID = 6.5
25						
	SS 3	Sample B-1(26')			26.0	PID = 7.9

Refusal at 26.0 feet.
Bottom of borehole at 26.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 8/17/16 11:10 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\A16.0195.00 (FT. JAMES).GPJ

BergerABAM
33301 9th Ave S, Suite 300
Federal Way, WA 98003
Telephone: 206-431-2000
Fax: 206-431-2250

BORING NUMBER B-1B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CRW **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS			0.5 6" Asphalt layer	
	SS 1	Sample B-1B(1')			(SM) Brown silty sand with gravels (dense, moist) no odor	PID = 5.6
		NS				PID = 7.6
5		NS				PID = 5.2
		NS				PID = 4.8
		NS				PID = 9.1
10		NS				PID = 9.5
		NS				PID = 6.8
	SS 2	Sample B-1B(14')	SM			PID = 7
15		NS				PID = 7.4
		NS				PID = 8.4
		NS				
20		NS			4' Brown sandy silt with large gravels (stiff, moist) no odor	PID = 9.4
		NS				PID = 7.9
25		NS				PID = 10.1
					26.0	
			CL		(CL) Becomes red silty clay (stiff, moist) no odor	PID = 6.7
	SS 3	Sample B-1B(28')			28.0	PID = 7

Refusal at 28.0 feet.
Bottom of borehole at 28.0 feet.

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BORING NUMBER B-2

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0					0.5 6" Asphalt layer	
	SS 1	Sample B-2(2')	SM		(SM) Light brown sandy silt with gravel (moist) no odor	PID = 1.8
		NS				PID = 1.8
5		NS				PID = 1.7
		NS				PID = 1.9
		NS				PID = 1.5
10		NS				PID = 1.2
		NS			11.0	
					11.8 8" layer of asphalt fragments and large gravel	
		NS			(SM) Light brown sandy silt with gravel (moist) no odor	
15		NS				PID = 1.3
		NS				PID = 1
20	SS 2	Sample B-2(20')				PID = 2.2
		NS				
		NS				PID = 2.7
25		NS	SM			PID = 2.1
		NS				
		NS				PID = 2
30		NS				PID = 3.1
		NS				
		NS				PID = 2
35		NS				PID = 1.6
		NS				PID = 2.3
					Becomes black	PID = 1.1
40	SS 3	Sample B-2(40')			40.0 Becomes dark brown	PID = 2

Refusal at 40.0 feet.
Bottom of borehole at 40.0 feet.

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BORING NUMBER B-3

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0					0.5 6" Asphalt layer	
	SS 1	Sample B-3(1') NS	SM		(SM) Brown sandy silt with gravel (moist) no odor	PID = 3.5
5		NS				PID = 2.6
		NS				PID = 2.8
		NS				PID = 2.6
10		NS				PID = 3.6
					11.0	PID = 4.8

Refusal at 11.0 feet.
Bottom of borehole at 11.0 feet.

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BORING NUMBER B-3B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS			0.5 6" Asphalt layer	
	SS 1	Sample B-3Bb(1')			(SM) Brown sandy silt with gravel (moist) no odor	PID = 8.3
		NS				
5		NS	SM			PID = 7.3
		NS				PID = 7.4
10	SS 2	Sample B-3B(10')				PID = 8.1
		NS			11.5	PID = 7.5
					12.0 Bedrock: solid grey rock (dry) no odor	

Refusal at 12.0 feet.
Bottom of borehole at 12.0 feet.

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BORING NUMBER B-4

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS	SM		(SM) Brown sandy silt (moist) no odor	PID = 1.9
	SS 1	Sample B-4(2')				
		NS				PID = 3.2
5		NS			Becomes light brown sandy silt (moist) no odor	PID = 4
		NS			Becomes dark brown sandy silt with large gravel (moist) no odor	PID = 7.3
		NS				PID = 3.4
10						PID = 4.6
						PID = 3.9
	SS 2	Sample B-4(12')				PID = 2.6
		NS				PID = 3.3
15		NS				PID = 3.9
		NS				PID = 3.5
		NS				PID = 1.2
20						PID = 3.7
		NS				PID = 2.7
		NS				PID = 1.5
25		NS				PID = 3.4
						PID = 3.5
		NS				PID = 2.4
30		NS				PID = 4.2
		NS				PID = 3.2
35		NS				PID = 3.7
						PID = 2
	SS 3	Sample B-4(37')			37.0	PID = 3.1

Refusal at 37.0 feet.
Bottom of borehole at 37.0 feet.

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BORING NUMBER B-5

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS	SM		(SM) Dark brown sandy silt with pea gravel (moist) no odor	PID = 0.4
		NS				
	SS 1	Sample B-5(3')				PID = 1.1
		NS			Becomes light brown sandy silt (moist) no odor	PID = 2.3
5		NS				PID = 1.8
		NS			Becomes grey sandy silt with gravel (moist) no odor	PID = 1.7
						PID = 2.2
10	SS 2	Sample B-5(10')				PID = 2.7
		NS				PID = 1.7
		NS			12.0 / 12.5 Bedrock: grey rocks with fragmented fines (moist) no odor	PID = 2.1

Refusal at 12.5 feet.
Bottom of borehole at 12.5 feet.

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BORING NUMBER B-5B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CRW **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	SS 1	Sample B-5B(1')	SM		0.5 (SM) 2" Brown sandy silt (moist) no odor	PID = 9.9
		NS	GP		(GP) 2' layer of gravel	
					2.0	
			SM		3.0 (SM) 1' brown sandy silt with gravel (moist) no odor	
		NS				
		NS	GP		(GP) 1.5' layer of pea gravel with silt	PID = 11.9
5					5.0	
	SS 2	Sample B-5B(6')			5.5 2" layer of asphalt	PID = 12
			GP		6.5 (GP) 1' layer of grey gravel	PID = 3.7
		NS	SM		8.0 (SM) Brown sandy silt (moist) no odor	PID = 6.7

Refusal at 8.0 feet.
Bottom of borehole at 8.0 feet.

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BORING NUMBER B-6

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- 31' (end of boring)
LOGGED BY CRW **CHECKED BY** AR
AT END OF DRILLING --- 31'
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- 31'

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		Sheen			0.8 10" Asphalt layer	PID = 5.6
	SS 1	Sample B-6(1')	GP		(GP) 2' Light brown gravel and rock (dry) no odor	
		NS			3.0	
					(ML) Dark grey silt with gravel (moist) no odor	PID = 6.7
5		NS				PID = 7.6
		NS				PID = 7.2
			ML			PID = 4.2
		NS				
10		NS				PID = 4.1
						PID = 6.2
		NS			12.5	
			GP		13.0 (GP) 6" Pea gravel with 1" rock (moist) no odor	PID = 6.8
					(ML) Brown silt with occasional gravel (stiff, moist) no odor	
15	SS 1	Sample B-6(15')				PID = 8.5
			ML			PID = 8.6
		NS				
		NS			19.5	
20			GP		20.3 (GP) 9" Brown gravel and rock (moist) no odor	PID = 5.3
		NS	ML		21.3 (ML) 1' Greyish brown silt (stiff, moist) no odor	
			GP		22.0 (GP) 9" Brown gravel and rock (moist) no odor	PID = 7
		NS			(SM) Orangish brown sandy silt with occassional rock (stiff, moist) no odor	
25		NS				PID = 6.3
			SM			PID = 7.6
		NS				
		NS				PID = 8.2
30						
	SS 1	Sample B-6(31')			30.5	PID = 9.5
			GW-GM		30.7 2" Wood chip layer	PID = 8.6
					31.0 (GW-GM) 4" Black fine gravel with silt (wet) no odor	

Refusal at 31.0 feet.
Bottom of borehole at 31.0 feet.

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BORING NUMBER B-7A

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS			0.5 6" Concrete layer	PID = 3.8
	SS 1	Sample B-7A(1')	GM		(GM) Grey gravel and rock with sand (moist) no odor	PID = 2.9
5	SS 2	Sample B-7A(5')			5.0	PID = 4

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

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BORING NUMBER B-7B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encoutered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS	SM		0.5 6" Ashphalt layer (SM) Dark brown silty sand (moist) no odor	PID = 1.7
	SS 1	Sample B-7B(3')			3.0	PID = 2.4

Refusal at 3.0 feet.
Bottom of borehole at 3.0 feet.

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BORING NUMBER B-7C

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	SS 1	NS Sample B-7C(1')	ML		(ML) Dark brown silt (stiff, dry) no odor	PID = 7.6
		NS				PID = 9.2
5		NS				PID = 7.9
			GP		5.3 6.0 (GP) 9" Brown gravel (dry) no odor	PID = 7.7

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER B-7D

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS	SM		0.5 6" Ashpalt layer	PID = 7.3
			GP		1.0 (SM) 6" Brown sandy silt with gravel (moist) no odor	
					1.5 (GP) 6" Gray gravel (dry) no odor	
		NS	SM		(SM) Light brown sandy silt with gravel (moist) no odor	
5	SS 1	Sample B-7D(5')			5.0	PID = 8.1

Refusal at 5.0 feet.
Bottom of borehole at 5.0 feet.

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BORING NUMBER B-8A

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING ---
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING ---

DEPTH (ft)	SAMPLE ID	GRAPHIC LOG	MATERIAL DESCRIPTION
0			
0.5			No core extracted due to refusal.

Refusal at 0.5 feet.
Bottom of borehole at 0.5 feet.

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BORING NUMBER B-8B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS	SM		(SM) Dark brown sandy silt with pea gravel (moist) no odor	PID = 4.2
		NS				PID = 4.3
	SS 1	Sample B-8B(3-4')				PID = 3.7
5		NS				PID = 4.5
	SS 2	Sample B-8B(6')				PID = 4.1
					6.0	

Refusal at 6.0 feet.
Bottom of borehole at 6.0 feet.

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BORING NUMBER B-8C

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	SS 1	NS Sample B-8C(1')	SM		(SM) Dark brown silty sand with pea gravel (moist) no odor	PID = 1.5
		NS				
	SS 2	Sample B-8C(3-4')				PID = 4.1
5		NS				PID = 3.8
		NS				PID = 3.6
						PID = 3.4
	SS 3	Sample B-8C(9')			9.0	PID = 3.2

Refusal at 9.0 feet.
Bottom of borehole at 9.0 feet.

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BORING NUMBER B-9

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CRW **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		Light Sheen		0.5	6" Asphalt layer	
	SS 1	Sample B-9(1')	SM		(SM) Reddish brown silty sand (stiff, moist) no odor	PID = 6.2
		Light Sheen			Becomes orangish brown	PID = 9.7
5		Light Sheen				PID = 9.3
	SS 2	Sample B-9(6')				PID = 7
		Light Sheen				PID = 6
		NS				PID = 5.9
10						PID = 7.3
	SS 3	Sample B-9(12')		12.0	Becomes dark grey	PID = 6.9

Refusal at 12.0 feet.
Bottom of borehole at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 8/17/16 11:10 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\A16.0195.00 (FT. JAMES).GPJ

BergerABAM
33301 9th Ave S, Suite 300
Federal Way, WA 98003
Telephone: 206-431-2000
Fax: 206-431-2250

BORING NUMBER B-10

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- None
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS			0.5 6" Asphalt layer	
	SS 1	Sample B-10(1')			(SM) Brown silty sand (moist, no odor)	PID = 2.3
		NS				
		NS				PID = 6.5
5						
		Very Light Sheen				PID = 3.7
						PID = 2.2
		Very Light Sheen	SM			PID = 2.7
10		Very Light Sheen				PID = 5.5
		NS				PID = 7.3
		NS				PID = 5.3
15						PID = 5.7
	SS 1	NS			15.0 16.0 Bedrock: solid grey rock (dry, no odor)	PID = 6

Refusal at 16.0 feet.
Bottom of borehole at 16.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 8/17/16 11:10 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\A16.0195.00 (FT. JAMES).GPJ

BergerABAM
33301 9th Ave S, Suite 300
Federal Way, WA 98003
Telephone: 206-431-2000
Fax: 206-431-2250

BORING NUMBER B-11

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/19/16 **COMPLETED** 7/19/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CDR **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0	SS 1	NS Sample B-11(1')	SM		(SM) Dark brown sandy silt with gravel (moist, no odor)	PID = 6.5
		NS				PID = 7.8
5		NS				PID = 6.5
		NS				
		NS				PID = 6.2
10						PID = 5.1
	SS 2	Sample B-11(12')			12.0	PID = 7

Refusal at 12.0 feet.
Bottom of borehole at 12.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 8/17/16 11:10 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\A16.0195.00 (FT. JAMES).GPJ

BergerABAM
33301 9th Ave S, Suite 300
Federal Way, WA 98003
Telephone: 206-431-2000
Fax: 206-431-2250

BORING NUMBER B-11B

CLIENT City of Camas
PROJECT NAME Phase II Environmental Site Assessment
PROJECT NUMBER A16.0195.00
PROJECT LOCATION 965 NW Drake Street, Camas, WA
DATE STARTED 7/20/16 **COMPLETED** 7/20/16
GROUND ELEVATION _____ **HOLE SIZE** 2 inches
DRILLING CONTRACTOR Pacific Soil & Water
GROUND WATER LEVELS:
DRILLING METHOD Direct-push Geoprobe
AT TIME OF DRILLING --- Groundwater not encountered
LOGGED BY CRW **CHECKED BY** AR
AT END OF DRILLING ---
NOTES Sampler: 5' acrylic sleeve
AFTER DRILLING --- None

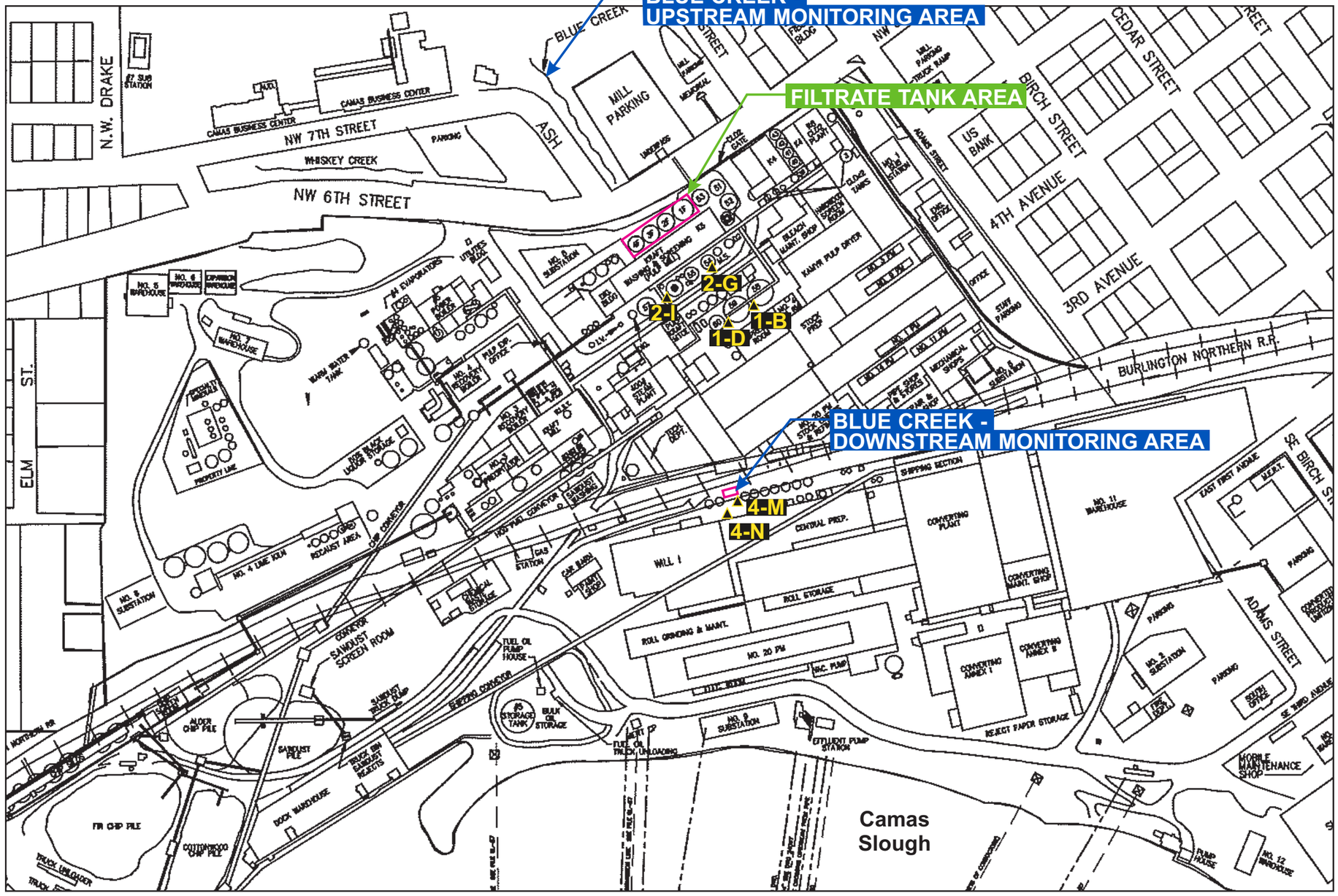
DEPTH (ft)	SAMPLE ID	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ENVIRONMENTAL DATA
0		NS			0.5 6" Asphalt layer	
	SS 1	Sample B-11B(1')	SP		(SP) Brown sand with gravels (moist) no odor	PID = 5.9
		NS				
5		NS			5.3	PID = 8.5
			MH		(MH) Dark grey clayey silt (stiff, moist) no odor	
	SS 2	Sample B-11B(8')			8.3	PID = 9.4
		NS	SP		(SP) Grey sand with gravels (moist) no odor	PID = 9.4
10		NS				PID = 7.9
		NS				PID = 6.1
15		NS			Becomes brown 15.0	
			SM		(SM) Brown silty sand (stiff, moist) no odor	PID = 6.7 PID = 7
	SS 3	Sample B-11(18')			17.5	PID = 5.4
			MH		(MH) Reddish brown clayey silt (moist) no odor	PID = 6.1
20					20.0	

Refusal at 20.0 feet.
Bottom of borehole at 20.0 feet.

GENERAL BH / TP / WELL - GINT STD US LAB.GDT - 8/17/16 11:10 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\A16.0195.00 (FT. JAMES).GPJ

Appendix C6

Excerpt from: Arcadis. 2011. Memo from Shannon Dunn and Ryan Shatt, Arcadis, to David Massengill, Georgia-Pacific LLC, RE: Investigation of Weak Black Liquor Release, Georgia-Pacific Consumer Products LLC, Camas Mill, Camas, Washington. 7 June.



0 500' 1000'

Approximate Graphic Scale: 1 = 500'

NOTES:

1. Basemap from Georgia-Pacific.

2. All boring locations are approximate.

GEORGIA-PACIFIC CORPORATION
GEORGIA-PACIFIC CAMAS MILL
INVESTIGATION OF WEAK BLACK LIQUOR RELEASE

SOIL BORING LOCATIONS

ARCADIS

FIGURE
3

09/15/2011 SYRACUSE, NY-ENV/CAD-DJHOWES
B006614/0001/03000/CDR/66141G01.CDR

Date Start/Finish: 08/24/2011
Drilling Company: Cascade Drilling
Driller's Name: Brooke King
Drilling Method: Geoprobe Direct Push
Sampling Method: 2-inch Macrocore
Rig Type: Geoprobe

Northing: NA
Easting: NA
Casing Elevation: NA

Borehole Depth: 15' bgs.
Surface Elevation: NA

Descriptions By: GRM

Well/Boring ID: **1B**

Client: Georgia-Pacific Consumer Products (Camas), LLC

Location: Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 0.6: Used carbide drill bit to break through concrete ~ 6 - 8 inches thick.	Top plugged with cement
	1	0-5	8/12			0.6 - 4: Hand augered through engineered fill*, dry.	
				9.37		4 - 5: Gray fine to medium subangular to angular GRAVEL, little fine to coarse sand (engineered fill*), wet.	
5				--		No Recovery.	
				--			
	2	5-10	36/60	9.04		7 - 8: Brown fine to coarse subangular to angular SAND and GRAVEL, trace fines (engineered fill*), wet.	
				8.09		8 - 10: Dark brown sandy SILT, wet.	Backfilled with bentonite chips.
				7.80		9: Dark brown silty SAND becoming sandy SILT, wet.	
10				8.38		10 - 12.5: Dark brown medium to coarse angular SAND and fine to coarse angular GRAVEL, trace fines, wet.	
				8.34			
	3	10-15	60/60	7.88		12.5 - 13.5: Brown silty SAND, trace fine to medium subround to subangular gravel, wet.	
				7.50		13.5 - 14.5: Brown fine to medium SAND, trace fines, wet.	
				7.38		14.5 - 15: Brown to black fine to coarse angular GRAVEL, trace sand (basalt). Refusal at 15' bgs.	
15							

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 08/24/2011 **Drilling Company:** Cascade Drilling **Driller's Name:** Brooke King **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 18' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **1D** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 0.6: Used carbide drill bit to break through concrete ~ 6 to 8 inches thick.	Top plugged with cement
						0.6 - 4: Hand augered through engineered fill*, dry. ~0.8 - 1.2: Used carbide bit to break through a second layer of concrete.	
	1	0-5	11/60				
						4 - 4.5: Light tan SILT, some fine to coarse subround to subangular gravel (crushed concrete / engineered fill*), dry.	
				--		4.5 - 5: Brown fine to coarse subround to subangular GRAVEL, trace fines (engineered fill*), wet.	
5				--		No Recovery.	
				--			
	2	5-10	22/60	--			
				9.64		8 - 9: Brown fine to medium subround to subangular GRAVEL and fine to medium SAND, little silt, wet.	
				8.86			
				9.21		9 - 9.5: Brown silty SAND and fine to medium subround to subangular GRAVEL, wet.	
				8.15		9.5 - 10: Brown medium subround to subangular GRAVEL and medium to coarse SAND, wet.	Backfilled with bentonite chips.
10				8.93		10 - 12: Brown to black SILT, some sand, little fine to medium subround gravel, wet.	
				8.06			
	3	10-15	52/60	8.36		12 - 12.5: Orangish brown silty SAND, little fine to medium round to subround gravel, wet.	
				7.97		12.5 - 15: Dark brown to reddish brown fine to coarse subangular to angular GRAVEL, little silty sand, wet.	
				7.80			
15				7.68		15 - 17: Brown fine to coarse angular SAND and fine to medium subangular to angular GRAVEL, wet.	
	4	15-18	26/36	7.74			
				7.74		17 - 18: Brown to black fine SAND, little fine to medium angular gravel, trace silt. Refusal at 18' bgs. Basalt.	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 08/24/2011 **Drilling Company:** Cascade Drilling **Driller's Name:** Brooke King **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 15' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID: 2G** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 0.6: Used carbide drill bit to break through concrete.	Top plugged with cement.
						0.6 - 4: Hand augered through engineered fill*, dry.	
	1	0-5	8/12				
				11.20		4 - 5: Tan silty SAND, little fine to medium subangular gravel (engineered fill*), dry.	
5				--		No Recovery.	
				--			
	2	5-10	36/60	8.70		7 - 9: Dark brown fine to coarse subangular to angular SAND, little fine to medium subangular gravel, trace silt (engineered fill*), moist.	Backfilled with bentonite chips.
				7.90			
				8.86		9 - 9.5: Light brown fine to coarse angular GRAVEL (possible fractured cobble or coarse gravel), dry.	
10				10.84		9.5 - 11: Brown fine to coarse subangular to angular SAND, little fine to medium subangular gravel, trace silt (engineered fill*), moist.	
				9.85		11 - 13: Black medium to coarse subround to subangular GRAVEL and fine to coarse angular SAND, trace wood fibers, wet, slight organic odor.	
	3	10-15	60/60	9.79			
				9.04		13 - 13.5: Light brown fine to coarse SAND, little fine subangular gravel, wet.	
				9.70		13.5 - 14.5: Black medium to coarse subround to subangular GRAVEL and fine to coarse angular SAND, trace wood fibers, wet, slight organic odor. 14.5 - 15: Gray fine to coarse angular GRAVEL, trace fine to coarse sand, wet.	
15						Refusal at 15.0' bgs. Basalt.	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 08/24/2011 **Drilling Company:** Cascade Drilling **Driller's Name:** Brooke King **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 19' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **2I** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 0.6: Used carbide drill bit to break through asphalt.	Top plugged with cold patch asphalt.
	1	0-5	16/24			0.6 - 4: Hand augered through engineered fill*, dry.	
				8.95		4 - 5: Brown fine to medium silty SAND, some fine to medium subangular to angular gravel (engineered fill*), dry to moist.	
5				--		No Recovery.	
				--			
	2	5-10	36/60	8.98		7 - 10: Brown fine to medium SAND, some fine to medium subangular to angular gravel, trace silt (engineered fill*), dry to moist.	
				8.96			
				8.92			
10				--		No Recovery.	Backfilled with bentonite chips.
				--			
	3	10-15	36/60	9.06		12 - 14.5: Dark brown fine to coarse subangular GRAVEL and fine to coarse subangular SAND (engineered fill*), trace silt / clay, moist to wet.	
				9.34			
				9.21		14.5 - 15: Black fine to coarse subangular to angular GRAVEL, little sand, wet.	
15				9.08		15 - 16.3: Brown fine to coarse subangular to angular SAND and GRAVEL, trace silt, wet.	
				9.55		16.3 - 16.8: Black fine to coarse subangular to angular GRAVEL, little sand, wet.	
	4	15-19	48/48			16.8 - 17.3: Brown fine to coarse, subangular to angular GRAVEL, trace sand, wet.	
				9.51		17.3 - 19: Brown fine to coarse subangular to angular SAND, some fine to coarse gravel, trace silt / clay, wet.	
				9.54		Refusal at 19' bgs. Basalt.	

ARCADIS
Infrastructure, environment, facilities

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*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 8/25/11 **Drilling Company:** Cascade Drilling **Driller's Name:** Shane Cormick **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 25' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **4M** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0						0 - 1.8: Used carbide drill bit to break through concrete.	Top plugged with cement.
	1	0-5	6/12			1.8 - 4: Hand augered through engineered fill*, dry to moist.	
				10.48		4 - 5: Brown fine to medium subangular to angular GRAVEL and fine to medium silty SAND (engineered fill*), moist.	
5				--		No Recovery.	
	2	5-10	8/60	--			
				--			
				8.10		9 - 10: Brown fine to coarse sandy SILT, little fine to medium subround gravel, moist to wet.	
10				--		10 - 12.5: Dark gray to black fine to medium SAND and SILT, some organics, sheen, wet. PID = 0.0 ppm.	
				9.29			
	3	10-15	56/60	10.56		12.5 - 13.5: Brown fine to medium subangular to angular GRAVEL, trace silt / clay, wet.	Backfilled with bentonite chips.
				9.17		13.5 - 14.5: Black fine to coarse subangular to angular GRAVEL, trace fine to coarse sand, wet.	
15				--		14.5 - 17: Brown to gray SILT / CLAY, high plasticity, wet.	
				--			
				--			
	4	15-20	42/60	8.07		17 - 18: Brown sandy SILT, low plasticity, wet.	
				7.66		18 - 20: Brown sandy SILT becoming brown fine SAND, trace to little silt, wet.	
20				7.37			

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 8/25/11 **Drilling Company:** Cascade Drilling **Driller's Name:** Shane Cormick **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 25' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **4M** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	5	20-25	60/60	7.53 7.13 6.96 6.93 7.13		20 - 20.7: Brown fine SAND, trace to little silt, wet. 20.7 - 21.3: Brown sandy SILT, medium to high plasticity, wet. 21.3 - 24: Brown fine SAND, trace to little silt, wet. 24 - 25: Brown fine SAND, trace silt, wet. Boring terminated at 25' bgs.	
25							

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 8/25/11 **Drilling Company:** Cascade Drilling **Driller's Name:** Shane Cormick **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 11' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **4N** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington

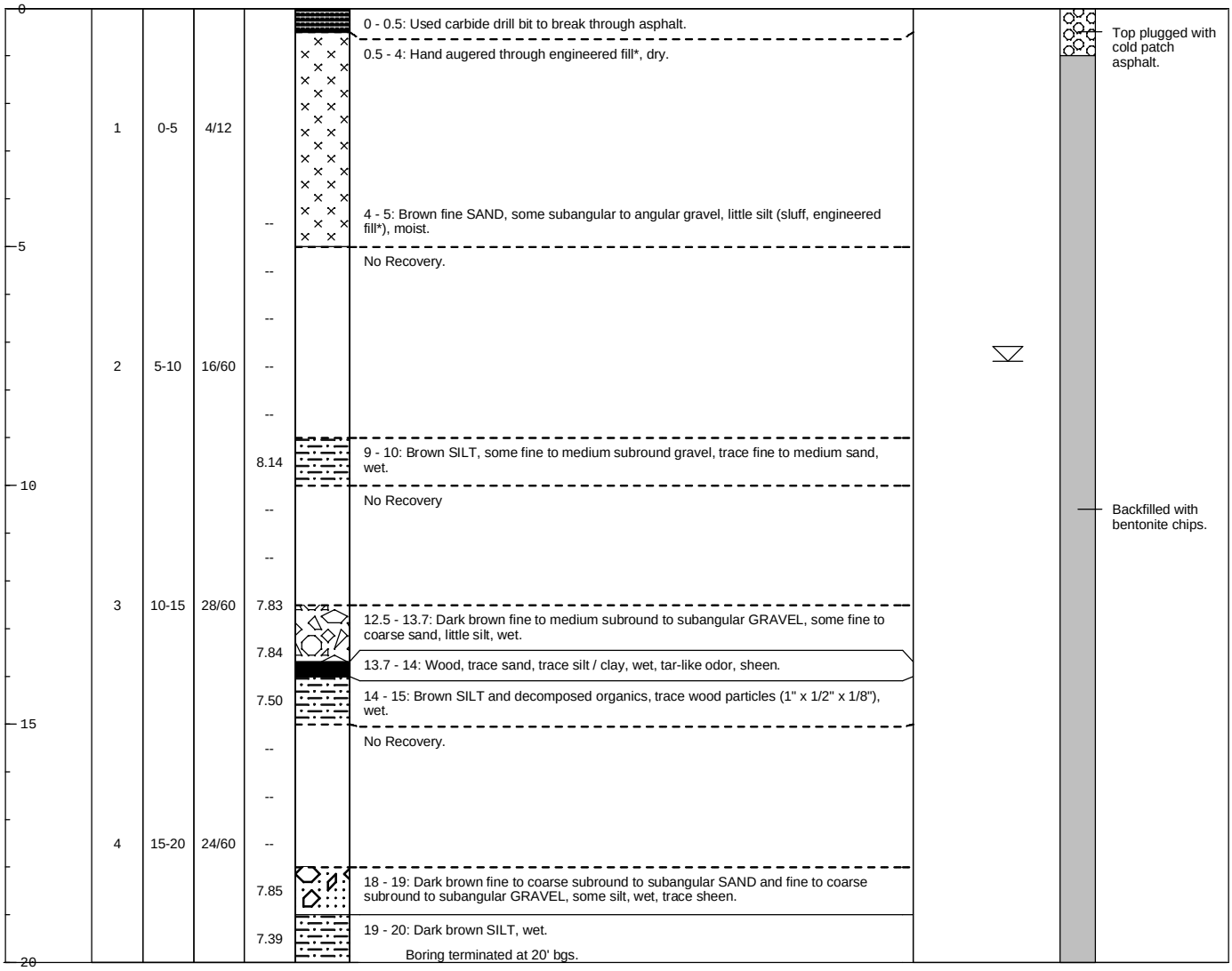
DEPTH	Sample Run Number	Sample/Int/Type	Recovery (inches)	YSI pH Reading	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	1	0-5	0/12			0 - 0.5: Used carbide bit to break through asphalt. 0.5 - 4: Hand augered through engineered fill*.	Top plugged with cold patch asphalt.
				--		No Recovery.	
5				7.51		5 - 6: Brown silty SAND, little fine to medium subround to subangular gravel (sluff, engineered fill*).	Backfilled with bentonite chips.
				--		6: Wood, tar-like odor, sheen. During installation core advanced to 6 ft then encountered an obstruction. After penetrating the obstruction, core advanced easily from 6 ft to 10 ft below grade.	
	2	5-10	13/60	--		No Recovery	
				--			
				--			
10	3	10-11	10/12	--		SAA: Wood in core shoe, tar-like odor, sheen. Refusal at 11' bgs. Boring offset 1' to 4N Offset (see boring log for 4N Offset).	

ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Date Start/Finish: 8/25/11 **Drilling Company:** Cascade Drilling **Driller's Name:** Shane Cormick **Drilling Method:** Geoprobe Direct Push **Sampling Method:** 2-inch Macrocore **Rig Type:** Geoprobe	**Northing:** NA **Easting:** NA **Casing Elevation:** NA **Borehole Depth:** 20' bgs. **Surface Elevation:** NA **Descriptions By:** GRM	**Well/Boring ID:** **4N Offset** **Client:** Georgia-Pacific Consumer Products (Camas), LLC **Location:** Camas Mill, Camas Washington



ARCADIS
Infrastructure, environment, facilities

Remarks: Soil descriptions based on visual/manual classification using Burmister system.
-- = not available / applicable; bgs = below ground surface; ft = feet; SAA = same as above

*Material designated "engineered fill" was consistently encountered immediately below concrete and asphalt surfaces and did not appear to be native. It did not contain significant portions of fines, and the gravel was typically angular.

Geosyntec consultants

APPENDIX D
Summary of Spills

Appendix D: Summary of Spills

SOU	OA	Operational Feature	Date Range	Type of Spill or Leak
A	A1	First Woodmill and Wood Chip PIles	2000-2001	diesel fuel and lube oil
A	A1	Dock Warehosue	2002	oil
A	A1	Second Woodmill	2001	lube oil
A	A1	Former Cat Shop, Electric Shop, and USTs	1999, 2015, 2018	diesel fuel and lube oil
B	B1	Kraft Mill	2014, 2016	black liquor
B	B1	Black Liquor Area	1997, 1998, 2000, 2001, 2002, 2001, 2012, 2014, 2018	black liquor or green liquor, K6 sewer overflow
B	B1	Former Bag Factory	2011, 2016	weak black liquor, process sewer
B	B1	Former Sulfite Mill	2013	black liquor mix
B	B1	Lime Kiln	1998, 1999, 2006	lime dust, green liquor
B	B2	Power House	2015	black liquor
B	B3	Kraft Pulp Bleaching	2000	sodium chlorate & sodium bichromate
B	B3	K4 Bleach Plant	2002	sodium chlorate (sodium dichromate)
B	B4	Fuel Oil Day Tank	2018	petroleum hydrocarbons
B	B6	Warehouse/Product Storage- North	2012	hydraulic oil
C	C1	Fuel Oil Storage	2003, 2020	petroleum hydrocarbon fuel
C	C2	Warehouse/product storage- South	1994, 2011, 2015	diesel fuel, hydraulic oil

Appendix D: Summary of Spills

SOU	OA	Operational Feature	Date Range	Type of Spill or Leak
C	C3	Waste Handling Area and Fueling Station	2018	diesel fuel, petroleum hydrocrbons
C	C3	Former Sulfur Pile	1999, 2006	hydraulic oil
C	C4	River Bank Pump House	1999, 2003, 2006, 2017	wastewater, diesel fuel, lube oil
C	C4	Effluent Pump Station	1977, 1982, 1983, 2006, 2012	process wastewater
D	D1	Landfill	1996, 1999, 2018	landfill leachate (seeps)
D	D1	Wastewater Treatment Plant	2004, 2005, 2015	TCDD (dioxin), diesel fuel, sulfuric acid
E	E1	Former Service Station	1991	petroleum hydrocarbons
F	F1	CBC Area	1988-1998	CZ 777, hydrogen chloride, dimethyl sulfide, dimethyl sulfoxide (DMSO), hydraulic fluid, wastewater with dilute thiodiphenol, process water, sewage, heptane, sulfur monochloride, caustic (50% sodium hydroxide)

Notes:

(a) Summary of spills is based on a review of available records. A complete, detailed description of site operational history, is difficult due to the lengthy operating history of mill and availability of site information and operating records.

Appendix E

Excerpt from: Kennedy Jenks, SPCC Plan, December 2022 Update

APPENDIX E

SPCC Tank and Equipment Inventory Tables
Excerpt from: Kennedy Jenks, SPCC Plan, December 2022 Update

Table 1: Oil Storage Containers and Oil-Containing Operational Equipment

Storage Tanks[a]

ID	Location (Grid)	Capacity[b] (gallons)	Contents	Material of Construction	Transfer Operations	Alarm System or Level Indicator?	Discharge or Drainage Control[c,d]
3	Fuel Station	1,000	Diesel	Steel	In: Pumped from tank truck Out: Pumped to vehicles or equipment	Level Indicator	Double-walled tank with additional tertiary containment area Approximate dimensions: 20ft X 23ft X 0.46ft
4	Riverbank Pump Generator	693	Diesel	Steel	In: Pumped from tank truck Out: N/A	Float	Double-walled tank
5	Skid-Mounted Fire Pump Engine	572	Diesel	Steel	In: Pumped from tank truck Out: N/A	Float	Double-walled tank
6	Effluent Pump Station Generator	250	Diesel	Steel	In: Pumped from tank truck Out: N/A	Float	Double-walled tank
7	Grit Sump Generator	205	Diesel	Steel	In: Pumped from tank truck Out: N/A	Float	Double-walled tank
9	Main Fuel Station	5,000	Gasoline	Steel	In: Pumped from tank truck Out: Pumped to vehicles or equipment	Level Indicator	Double-walled tank with additional tertiary containment area Approximate dimensions: 20ft X 23ft X 0.46ft
15	Turbine Generator Main Tank	3500	Lube Oil	Steel	In: Truck	Gauge/alarm	5400 gallon in-ground sump Approximate Dimensions: 10ft X 12ft X 6ft

Notes

(a) Storage Tank locations are illustrated on Figure 3
(b) Quantity provided is shell capacity or typical oil quantity for vessels with a small proportion of oil.
(c) Minimum required containment size calculated as the sum of the volume of the largest container within the containment plus sufficient freeboard for precipitation defined as a 25-year 24-hour reference event for uncovered areas. Sized containment requirements apply only to bulk storage tanks, mobile/portable storage containers, and loading/unloading racks.
(d) Alternative requirements instead of secondary containment for oil-containing operational equipment include documented procedures in place for inspection and monitoring of equipment to detect failure and/or discharge, and a Spill Contingency Plan.

Table 2: Oil Storage Containers and Oil-Containing Operational Equipment

Mobile/Portable Storage Containers[a]

ID	Location	Type	Quantity[b] (gallons)	Contents	Discharge or Drainage Control[c,d]
20	Additives – 15 M/C Basement	Totes	20 x 275 gallons	Release Oil	Trench drain with weir provides containment Approx dimensions (inches): (42 x 12 x 8) + (308 x 18 x 8) + (114 x 12 x 8) + (211 x 18 x 8) = 52 ft³ = 388 gallons
21	Compressor Building- Compressor Room East	Drum	1 x 60 gallon	Mobile oil	Inside building. Containment in place.
23	Car Barn (W of Will I) Main Lube Room	Tote Tote Drums	3 x 55 gallon, 2 x 250 gallon 90 x 55 gallon	Miscellaneous Oil Miscellaneous Oil Miscellaneous Oil	Concrete containment inside building Approximate dimensions: 44 ft X 26 ft X 0.2 ft = 228.8 ft³ / 1,712 gallons
24	Converting Maintenance	Totes/Drums	4 x 55 gallon	Miscellaneous Oil	Inside building. Containment in place.
25	Unitizer Supply (SAA # 62)	Drum Drum	1x 55 gallon 1x 55 gallon	Miscellaneous Oil, Used oil	Inside building. Containment in place.
26	#1 M/C Basement	Drum Tote (stack) Tote	1 x 55 gallon 3 x 55 gallon 1x 250 gallon	Hydraulic Oil Miscellaneous Oil Lube oil	Inside building. Containment in place. Inside building. Containment in place.
31	Lady Island Cali Plant Bldg.	Drum Drum Tote	3 x 55 gallon 8 x 55 gallon 1 x 250 gallon	Kerosene 450 Miscellaneous Oil Used Oil	Inside building. Containment in place. Inside building. Containment in place. Inside building. Containment in place.
32	Bleach Plant/Stock Prep (SAA # 17)	Drum	1 x 55 gallon	Used Oil	Inside building. Containment in place.
33	No. 11 PM Basement (SAA # 27)	Drum	1 x 55 gallon	Used Oil	Inside. Containment in place
34	Converting Plant Mtce Shop (SAA # 32)	Drum	1 x 55 gallon	Used Oil	Inside. Containment in place
35	Mobile Mtce (SAA # 39)	Tote	1 x 250 gallon 2 x 250 gallon	Used Oil Miscellaneous Oil	Inside building. Containment in place. Hose threaded to the container
36	Car Barn (SAA # 40)	Drum	1 x 55 gallon	Used Oil	Inside building. Containment in place.
37	Dangerous Waste Staging Area (SAA # 49)	Totes Drums	12 x 350 gallon 12 x 55 gallon	Used Oil Used Oil	Local sump with automatic float and alarm – active containment vs. passive containment (operator shutoff power to pump in event of oil release) Approximate dimensions: 6 ft X 4 ft X 3 ft = 72 ft³ / 538 gallons
40	Mobile Maintenance	Drum Drum	4 x 55 gallon 1 x 55 gallon	Misc. Oil Lube Oil	Outside. Containment in place Inside building. Containment in place.
41	#9 Air Compressor (20 PM basement)	Drum	1 x 55 gallon	Lube Oil	Inside, Containment = basement. Containment in place
42	#11PM hydrapulper gearbox area	Drum	2 x 55 gallon	Lube Oil	Inside building. Containment in place.
43	#11PM “rudder” shop	Tote	4 x 275 gallon	Release Oil	Inside, on containment totes
44	#11PM Machine Floor	Tote	3 x 55 gallon	Miscellaneous Oil	Inside building. Containment in place.
45	North side maintenance shop (below outside repulper)	Drum	2 x 55 gallon	Miscellaneous Oil	Inside building. Containment in place.
231	Cali Building – Fournier Press	Tote	2 x 250 gallon	Polymer	Inside building. Containment in place.

Notes

(a) Mobile/Portable Storage Container locations are illustrated on Figure 4
(b) Quantity provided is shell capacity or typical oil quantity for vessels with a small proportion of oil.
(c) Minimum required containment size calculated as the sum of the volume of the largest container within the containment plus sufficient freeboard for precipitation defined as a 25-year 24-hour reference event for uncovered areas. Sized containment requirements apply only to bulk storage tanks, mobile/portable storage containers, and loading/unloading racks.
(d) Alternative requirements instead of secondary containment for oil-containing operational equipment include documented procedures in place for inspection and monitoring of equipment to detect failure and/or discharge, and a Spill Contingency Plan.

Table 3: Oil-Containing Operational Equipment

Oil-Containing Operational Equipment[a]

ID	Description	Location	Quantity[b] (gallons)	Contents	Material of Construction	Discharge or Drainage Control[c,d]
52	#8 Air Compressor	5PB BASEMENT	55+	Oil	Steel	No containment
55	#19 Air Compressor	COMPRESSOR ROOM	130	Oil	Steel	No containment
56	#20 Air Compressor	COMPRESSOR ROOM	130	Oil	Steel	No containment
59	#11 Main Lube Oil System	11 PM Basement (NE corner)	600	Oil	Steel	Containment (needs calculated) (150 gallons)
60	#11 PM Main Hydraulic	Two reservoirs	150/each	Oil DTE24	Steel	Containment but needs plug
61	Unitizer hydraulic tanks for palletizer	Unitizer (two total)	100/each	Hydraulic	Steel	Inside building
62	OFEE 112	#1 SUB, N OF OFFICES	363	Oil	Steel	No containment out of service
63	OFEE 113	#1 SUB, N OF OFFICES	363	Oil	Steel	No containment out of service
64	OFEE 117	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment
65	OFEE 118	#10 SUB, S OF CLAR	363	Oil	Steel	No containment out of service
66	OFEE 119A	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment
67	OFEE 119B	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment out of service
68	OFEE 120	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment out of service
69	OFEE 121	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment out of service
70	OFEE 123	#5 SUB, S OF OFFICES	363	Oil	Steel	No containment
71	OFEE 125	#6 SUB, W OF LIME KILN	255	Oil	Steel	No containment
72	OFEE 126	#6 SUB, W OF LIME KILN	255	Oil	Steel	No containment
73	OFEE 127	#6 SUB, W OF LIME KILN	205	Oil	Steel	No containment
74	OFEE 128	#6 SUB, W OF LIME KILN	255	Oil	Steel	No containment
75	OFEE 129	#6 SUB, W OF LIME KILN	255	Oil	Steel	No containment
76	OFEE 136	#8 SUB, BY N GATE	363	Oil	Steel	No containment
77	OFEE 137	#8 SUB, BY N GATE	363	Oil	Steel	No containment
78	OFEE 138	#8 SUB, BY N GATE	363	Oil	Steel	No containment
79	OFEE 139	#9 SUB, S OF #20 M/C	363	Oil	Steel	No containment
80	OFEE 140	#9 SUB, S OF #20 M/C	363	Oil	Steel	No containment
81	OFEE 141	#9 SUB, S OF #20 M/C	363	Oil	Steel	No containment
84	TRANSFORMER 1001T	#5 SUB, S OF OFFICES	2935	Oil	Steel	No containment
85	TRANSFORMER 1078T	#4 R.F. PREC.	76	Oil	Steel	No containment
86	TRANSFORMER 1267T	SEC. TREATMENT POND	215	Oil	Steel	Containment wall
87	TRANSFORMER 1377T	#5 SUB, S OF OFFICES	2285	Oil	Steel	No containment
88	TRANSFORMER 1406T	#8 SUB, BY N GATE	5935	Oil	Steel	No containment
89	TRANSFORMER 1407T	#8 SUB, BY N GATE	2700	Oil	Steel	No containment
90	TRANSFORMER 1479T	SEC. TREATMENT POND	332	Oil	Steel	No containment
91	TRANSFORMER 268T	#5 SUB, S OF OFFICES	1130	Oil	Steel	No containment
92	TRANSFORMER 272T	#2 SUB, NW OF SMO	1237	Oil	Steel	No containment
93	TRANSFORMER 353T	#10 SUB, S OF CLAR	1160	Oil	Steel	No containment
94	TRANSFORMER 354T	#10 SUB, S OF CLAR	1160	Oil	Steel	No containment
96	TRANSFORMER 418T	#5 SUB, S OF OFFICES	1060	Oil	Steel	No containment
97	TRANSFORMER 420T	#5 SUB, S OF OFFICES	1060	Oil	Steel	No containment
99	TRANSFORMER 441T	#5 SUB, S OF OFFICES	1010	Oil	Steel	No containment
100	TRANSFORMER 442T	#5 SUB, S OF OFFICES	1010	Oil	Steel	No containment

Table 3: Oil-Containing Operational Equipment

ID	Description	Location	Quantity[b] (gallons)	Contents	Material of Construction	Discharge or Drainage Control[c,d]
101	TRANSFORMER 443T	#5 SUB, S OF OFFICES	1010	Oil	Steel	No containment
102	TRANSFORMER 486T	#6 SUB, W OF LIME KILN	1590	Oil		No containment
103	TRANSFORMER 513T	#1 SUB, N OF OFFICES	1885	Oil		No containment
104	TRANSFORMER 529T	#6 SUB, W OF LIME KILN	1140	Oil	Steel	No containment
105	TRANSFORMER 633T	SEC. TREATMENT POND	340	Oil		No containment
106	TRANSFORMER 634T	SEC. TREATMENT POND	340	Oil		No containment
107	TRANSFORMER 635T	SEC. TREATMENT POND	340	Oil		No containment
108	TRANSFORMER 666T	#1 SUB, N OF OFFICES	2309	Oil		No containment
109	TRANSFORMER 687T	L.K. #4 F. E. XFMR VAULT	216	Oil		No containment
110	TRANSFORMER 872T	SEC. TREATMENT POND	415	Oil	Steel	No containment
111	TRANSFORMER 873T	SEC. TREATMENT POND	415	Oil	Steel	No containment
112	TRANSFORMER 901T	#8 SUB, BY N GATE	1934	Oil	Steel	No containment
113	TRANSFORMER 916T	#9 SUB, S OF #20 M/C	1934	Oil	Steel	No containment
114	TRANSFORMER 917T	#9 SUB, S OF #20 M/C	1934	Oil	Steel	No containment
115	TRANSFORMER 918T	#9 SUB, S OF #20 M/C	3060	Oil	Steel	No containment
116	TRANSFORMER 1019T	NAPKIN BLDG NW	195	Oil		No containment
117	TRANSFORMER 1036T	#10 P/M SW	187	Oil		No containment
118	TRANSFORMER 1037T	CONVERTING PLANT N.	186	Oil		No containment
119	TRANSFORMER 1038T	#1 P/M (OVER WINDER)	186	Oil		No containment
120	TRANSFORMER 1043T	#3 F.R. ON MEZZINE	206	Oil		No containment
121	TRANSFORMER 1094T	SOUTH END CDC BLDG.	371	Oil		No containment
123	TRANSFORMER 1142T	OVER #5 RACK ROOM	184	Oil		No containment
124	TRANSFORMER 1143T	15 P/M JORDANELL SW. RM.	226	Oil		No containment
125	TRANSFORMER 1145T	#12 P/M XFMR VAULT (BSMT)	184	Oil		No containment
126	TRANSFORMER 1146T	#4A SW. RM.	184	Oil	Steel	No containment
127	TRANSFORMER 1148T	K-4 SW. RM.	178	Oil		No containment
128	TRANSFORMER 1149T	K-4 SW. RM.	178	Oil		No containment
129	TRANSFORMER 1150T	K-4 SW. RM.	178	Oil		No containment
130	TRANSFORMER 1159T	TOP OF RAMP SE OF PULP MILL	192	Oil		No containment
131	TRANSFORMER 1160T	H.D. SW. RM. (KM)	178	Oil		No containment
132	TRANSFORMER 1164T	15 P/M JORDANELL SW. RM.	226	Oil		No containment
133	TRANSFORMER 1178T	10 P/M SW. RM.	189	Oil		No containment
134	TRANSFORMER 1179T	XFMR VAULT OVER PULP DRYER	182	Oil		No containment
135	TRANSFORMER 1182T	#4A SW. RM.	189	Oil		No containment
136	TRANSFORMER 1216T	K-3 XFMR VAULT (2 FL)	178	Oil		No containment
137	TRANSFORMER 1219T	K-3 XFMR VAULT (2 FL)	178	Oil		No containment
138	TRANSFORMER 1220T	K-3 XFMR VAULT (2 FL)	178	Oil		No containment
139	TRANSFORMER 1228T	#12 P/M SW. RM.	229	Oil		No containment
140	TRANSFORMER 1229T	2ND FLOOR K4 BLEACH	178	Oil		No containment
141	TRANSFORMER 1232T	#5 PB 1ST FLOOR	186	Oil		No containment
142	TRANSFORMER 1233T	#5 PB 1ST FLOOR	186	Oil		No containment
143	TRANSFORMER 1246T	#4 SW.RM.	172	Oil		No containment
144	TRANSFORMER 1252T	#4A SW. RM.	186	Oil		No containment

Table 3: Oil-Containing Operational Equipment

ID	Description	Location	Quantity[b] (gallons)	Contents	Material of Construction	Discharge or Drainage Control[c,d]
145	TRANSFORMER 1253T	KM XFMR VAULT	176	Oil		No containment
146	TRANSFORMER 1258T	#77 SW. RM.	186	Oil		No containment
147	TRANSFORMER 1259T	#77 SW. RM.	186	Oil		No containment
148	TRANSFORMER 1261T	1 P/M BSMT NORTH SIDE	179	Oil		No containment
149	TRANSFORMER 1273T	7 P/M BSMT (5-7 SW. RM.)	189	Oil		No containment
150	TRANSFORMER 1274T	7 P/M BSMT (5-7 SW.RM.)	189	Oil		No containment
151	TRANSFORMER 1301T	#4A SW. RM.	171	Oil		No containment
153	TRANSFORMER 1306T	#3 RF PENTHOUSE PREC.	120	Oil		No containment
155	TRANSFORMER 1308T	#3 RF PENTHOUSE PREC.	120	Oil		No containment
156	TRANSFORMER 1309T	#3 RF PENTHOUSE PREC.	120	Oil		No containment
157	TRANSFORMER 1310T	#3 RF PENTHOUSE PREC.	120	Oil		No containment
158	TRANSFORMER 1320T	#3 SUB., 1ST FLOOR	419	Oil		No containment
159	TRANSFORMER 1321T	#3 SUB., 1ST FLOOR	419	Oil		No containment
160	TRANSFORMER 1337T	3PB PRECIP. ROOF	120	Oil		No containment
161	TRANSFORMER 1339T	3PB PRECIP. ROOF	120	Oil		No containment
162	TRANSFORMER 1340T	3PB PRECIP. ROOF	120	Oil		No containment
163	TRANSFORMER 1373T	NE CORNER WILL 2 BLDG.	350	Oil		No containment
164	TRANSFORMER 1379T	E OF STM PLT & RAMP	622	Oil		No containment
165	TRANSFORMER 1391T	UNIT SUB US 3PB-3	217	Oil		No containment
166	TRANSFORMER 722T	DOCK N. XFMR. VAULT	179	Oil		No containment
167	TRANSFORMER 756T	ON ROOF SO. SIDE-CONV.	202	Oil		No containment
168	TRANSFORMER 903T	UNIT SUB US KRPW-2	196	Oil		No containment
169	TRANSFORMER 905T	UNIT SUB US K5-1	196	Oil		No containment
170	TRANSFORMER 906T	UNIT SUB US K5-2	196	Oil		No containment
171	TRANSFORMER 907T	UNIT SUB US MGO PS-1	196	Oil		No containment
172	TRANSFORMER 908T	UNIT SUB US MGO-DIG-1	196	Oil		No containment
173	TRANSFORMER 909T	UNIT SUB US MGO-DIG-2	196	Oil		No containment
174	TRANSFORMER 919T	20 P/M XFMR VAULT D.E.	283	Oil		No containment
175	TRANSFORMER 920T	20 P/M XFMR VAULT D.E.	283	Oil		No containment
176	TRANSFORMER 921T	20 P/M XFMR VAULT D.E.	283	Oil		No containment
177	TRANSFORMER 922T	20 P/M XFMR VAULT D.E.	283	Oil		No containment
178	TRANSFORMER 926T	20 P/M XFMR VAULT D.E.	196	Oil		No containment
179	TRANSFORMER 927T	20 P/M XFMR VAULT D.E.	196	Oil		No containment
180	TRANSFORMER 928T	20 P/M XFMR VAULT D.E.	196	Oil		No containment
181	TRANSFORMER 929T	20 P/M XFMR VAULT D.E.	196	Oil		No containment
182	TRANSFORMER 930T	20 P/M XFMR VAULT D.E.	130	Oil		No containment
183	TRANSFORMER 931T	20 P/M XFMR VAULT D.E.	117	Oil		No containment
184	TRANSFORMER 955T	15 P/M JORDANELL SW. RM.	196	Oil		No containment
185	TRANSFORMER 956T	LURGI BSMT.	196	Oil		No containment
186	TRANSFORMER 971T	CHIP SCRN. RM. SW. RM.	196	Oil		No containment
187	TRANSFORMER 997T	CHIP SCRN. RM. SW. RM.	183	Oil		No containment
188	TRANSFORMER 998T	CHIP SCRN. RM. SW. RM.	196	Oil		No containment
191	TRANSFORMER UNIT 1324T	USPO-1 SWRM 130B TC284	270	Oil		Containment

Table 3: Oil-Containing Operational Equipment

ID	Description	Location	Quantity[b] (gallons)	Contents	Material of Construction	Discharge or Drainage Control[c,d]
192	OFEE 114	#1 Sub, N. of Offices	363	Oil		No containment
193	OFEE 115	#1 Sub, N. of Offices	363	Oil		No containment
194	OFEE 124	#6 Sub W of Lime Kiln	205	Oil		No containment
195	OFEE 130	#6 Sub W of Lime Kiln	255	Oil		No containment
196	OFEE 131	#6 Sub W of Lime Kiln	255	Oil		No containment
197	OFEE 132	#6 Sub W of Lime Kiln	255	Oil		No containment
198	OFEE 129	#6 Sub W of Lime Kiln	205	Oil		No containment
199	TRANSFORMER UNIT 900T	#8 Sub, By N. Gate	1934	Oil		No containment
200	TRANSFORMER UNIT 902T	#8 Sub, By N. Gate	3060	Oil		No containment
201	TRANSFORMER UNIT 904T	Unit Sub US KRPW-1	196	Oil		Containment
202	TRANSFORMER UNIT 923T	20 P/M XFMR Vault D.E	283	Oil		Containment
203	TRANSFORMER UNIT 924T	20 P/M XFMR Vault D.E	196	Oil		Containment
204	TRANSFORMER UNIT 925T	20 P/M XFMR Vault D.E	196	Oil		Containment
205	TRANSFORMER UNIT 271T	#2 Sub NW of SMO	1305	Oil		No containment
206	TRANSFORMER UNIT 270T	#2 Sub NW of SMO	1305	Oil		No containment
207	TRANSFORMER UNIT 269T	#2 Sub NW of SMO	1305	Oil		No containment
208	CLARIFIER OFEE	#10 Sub, S. of Clarifier OFEE	363	Oil		No containment
209	TRANSFORMER UNIT 355T	#10 Sub S. of Clarifier	1160	Oil		No containment
210	TRANSFORMER UNIT 485T	#6 Sub, W of Lime Kiln	2429	Oil		No containment
211	TRANSFORMER UNIT 1422T	USST4-1 TC289	489	Oil		Containment
212	TRANSFORMER UNIT 1218T	TC9023	178	Oil		Containment
213	TRANSFORMER UNIT 1217T	TC9022	178	Oil		Containment
214	TRANSFORMER UNIT 1250T	4RF TC312	176	Oil		Containment
215	TRANSFORMER UNIT 1251T	4RF TC311	287	Oil		Containment
216	TRANSFORMER UNIT 1249T	4RF TC310	176	Oil		Containment
218	TRANSFORMER UNIT 1158T	4RF TC347	100	Oil		Containment
219	TRANSFORMER UNIT 1155T	4RF TC345	100	Oil		Containment
220	TRANSFORMER UNIT 861T	4RF TC209	75	Oil		Containment
221	TRANSFORMER UNIT 1157T	4RF TC344	100	Oil		Containment
222	TRANSFORMER UNIT 863T	4RF TC210	76	Oil		Containment
223	TRANSFORMER UNIT 874T	4RF TC212	76	Oil		Containment
224	TRANSFORMER UNIT #2TR-A6B	4RF	125	Oil		Containment
225	TRANSFORMER UNIT 1257T	3RF TC317	176	Oil		Containment
226	TRANSFORMER UNIT 1239T	3RF TC316	242	Oil		Containment
227	TRANSFORMER UNIT 1240T	3RF TC315	242	Oil		Containment
228	TRANSFORMER UNIT 1241T	3RF TC318	207	Oil		Containment
229	TRANSFORMER UNIT 1254T	3RF TC314	176	Oil		Containment
230	TRANSFORMER UNIT 1305T	3RF TC326	120	Oil		Containment

Table 3: Oil-Containing Operational Equipment

Notes

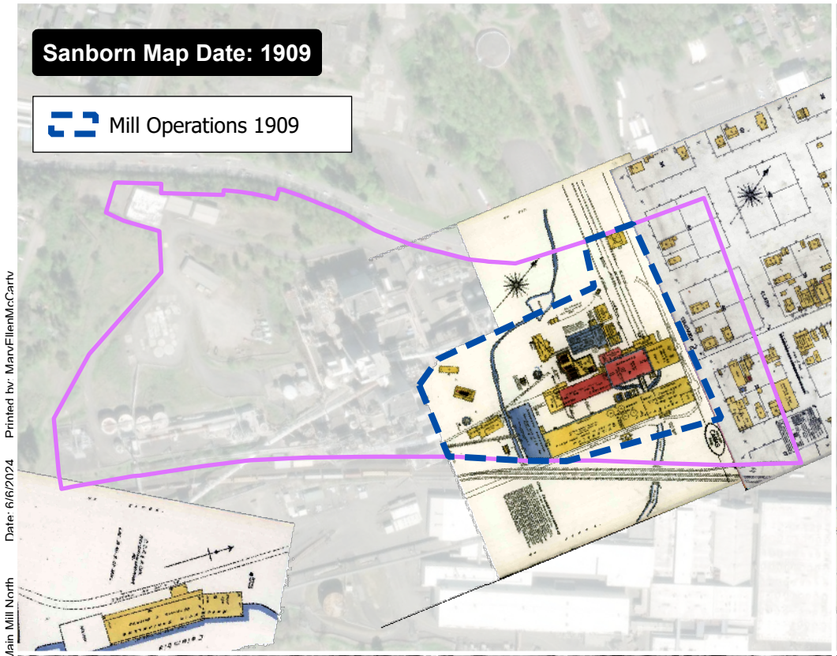
(a) Oil Filled Operating Equipment locations are illustrated on Figures 5 through 8.
(b) Quantity provided is shell capacity or typical oil quantity for vessels with a small proportion of oil.
(c) Minimum required containment size calculated as the sum of the volume of the largest container within the containment plus sufficient freeboard for precipitation defined as a 25-year 24-hour reference event for uncovered areas. Sized containment requirements apply only to bulk storage tanks, mobile/portable storage containers, and loading/unloading racks.
(d) Alternative requirements instead of secondary containment for oil-containing operational equipment include documented procedures in place for inspection and monitoring of equipment to detect failure and/or discharge, MERT response, and a Spill Contingency Plan (Appendix B).

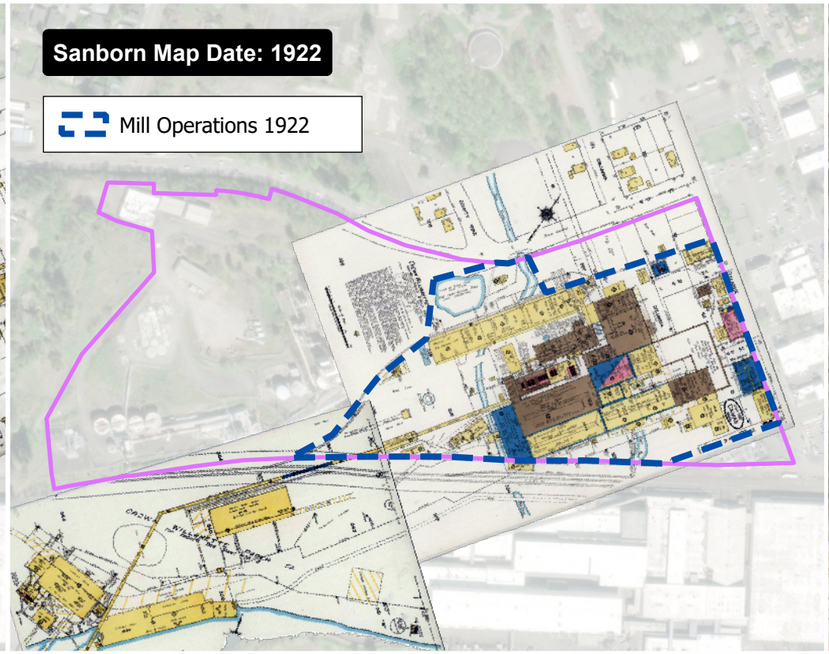
Table 4: Potential Discharges and Direction of Flow

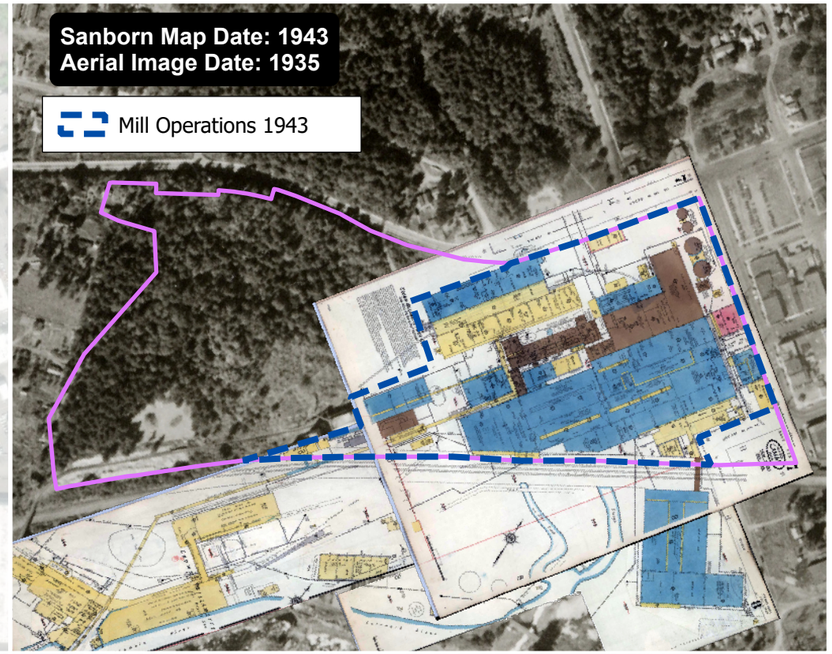
Potential Event	Maximum Volume Released (Gallons)	Maximum Discharge Rate	Direction of Flow Outside Containment	Secondary Containment Per 40 CFR 112.7(b)
Bulk Storage Tanks (Aboveground Storage Tanks 3-15)				
3 - Fuel Station				
Failure of AST (collapse or puncture below product level)	1,000	Gradual to instantaneous	Inside concrete containment	Double-walled tank
Tank Overfill	10	10 gal/min		concrete containment
Pipe Failure during transfer	20	Gradual		concrete containment
Leaking Pipe or Valve Packing	5	Gradual		concrete containment
4 - Riverbank Pump Generator				
Failure of AST (collapse or puncture below product level)	693	Gradual to instantaneous	Paved area to process sewer	Double-walled tank
Tank Overfill	10	10 gal/min		MERT
Pipe Failure during transfer	20	Gradual		MERT
Leaking Pipe or Valve Packing	5	Gradual		process sewer
5 - Skid-Mounted Fire Pump Engine				
Failure of AST (collapse or puncture below product level)	572	Gradual to instantaneous	Paved area to process sewer	Double-walled tank
Tank Overfill	10	10 gal/min		MERT
Pipe Failure during transfer	20	Gradual to instantaneous		MERT
Leaking Pipe or Valve Packing	5	Gradual		process sewer
6 - Effluent Pump Station Generator				
Failure of AST (collapse or puncture below product level)	250	Gradual to instantaneous	Inside building to process sewer	Double-walled tank
Tank Overfill	10	10 gal/min		MERT
Pipe Failure during transfer	20	Gradual		MERT
Leaking Pipe or Valve Packing	5	Gradual		process sewer
7 - Grit Sump Generator				
Failure of AST (collapse or puncture below product level)	205	Gradual to instantaneous	Paved area to process sewer	Double-walled tank
Tank Overfill	10	10 gal/min		MERT
Pipe Failure during transfer	20	Gradual		MERT
Leaking Pipe or Valve Packing	5	Gradual		process sewer
9 - Main Fuel Station				
Failure of AST (collapse or puncture below product level)	5,000	Gradual to instantaneous	Inside concrete containment	Double-walled tank
Tank Overfill	10	10 gal/min		concrete containment
Pipe Failure during transfer	20	Gradual		concrete containment
Leaking Pipe or Valve Packing	5	Gradual		concrete containment
Bulk Storage Tanks (Aboveground Storage Tanks 3-15) (continued)				
15 - Turbine Generator Main Tank				
Failure of AST (collapse or puncture below product level)	3,500	Gradual to instantaneous	Inside in-ground sump	5,400-gallon in-ground sump
Tank Overfill	40	40 gal/min		
Pipe Failure during transfer	20	Gradual		
Leaking Pipe or Valve Packing	5	Gradual		
Portable Storage - Tank, Totes, and Drums				
Leak or Failure of Tote	Max tote volume; varies by container	Gradual to instantaneous	Drains to process sewer	Secondary containment
Leak or Failure of Drum	55	Gradual to instantaneous	Drains to process sewer	Secondary containment

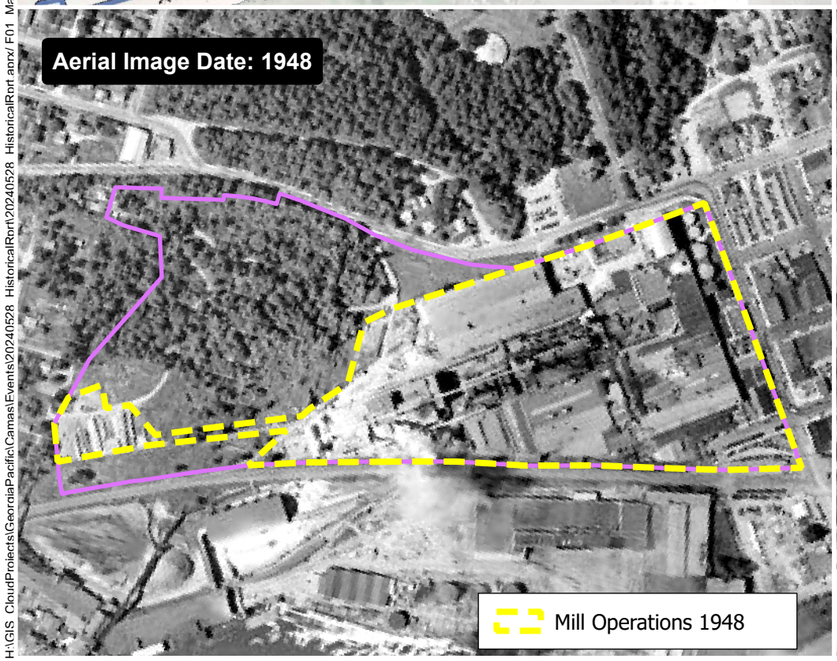
APPENDIX F
Visual Timeline

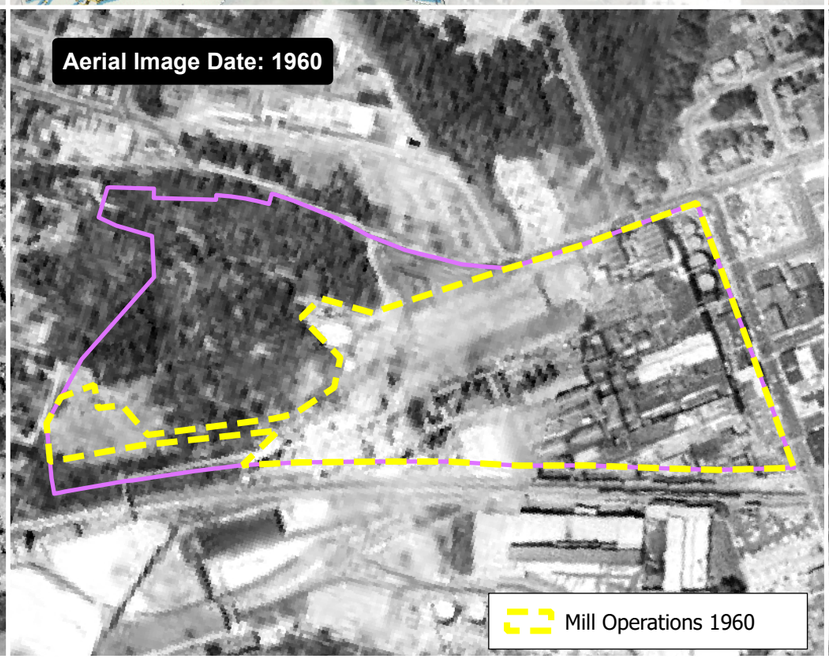
World Imagery: Maxar

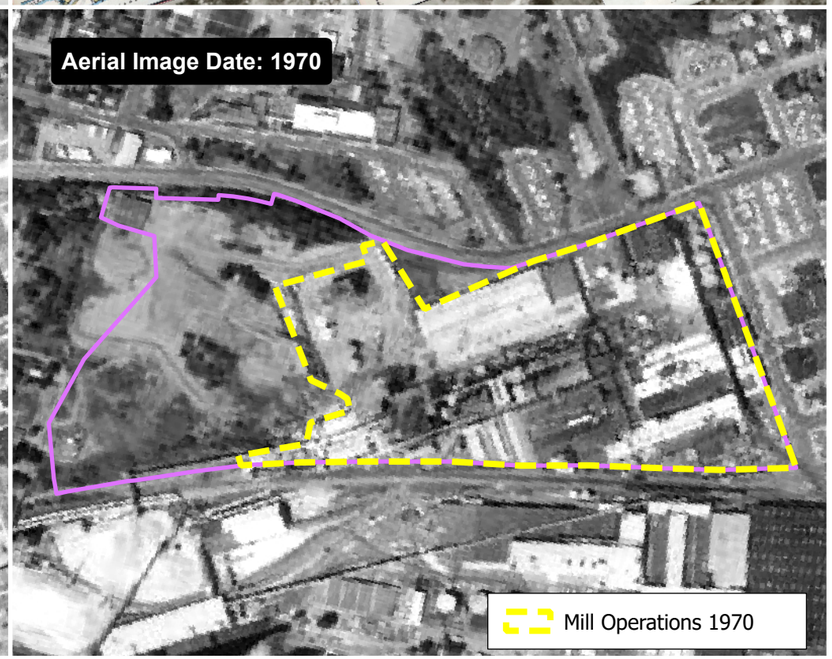












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Legend

Mill Property Boundary Presented on RI Work Plan Figures

Notes:

1. Locations are approximate.
2. Aerial Map source: Environmental Data Resources, Inc. (EDR)
3. Sanborn Map image source: United States Library of Congress.
4. Georeferencing by Kennedy Jenks.

GP Camas Mill
Camas, Washington

Main Mill North
Mill Operations 1909 - 1970

Figure F1