HALEY ALDRICH

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REPORT ON

REMEDIAL INVESTIGATION WORK PLAN
TREOIL INDUSTRIES BIOREFINERY
4242 ALDERGROVE ROAD
FERNDALE, WASHINGTON

by
Haley & Aldrich, Inc.
Seattle, Washington

for
Washington State Department of Ecology
Shoreline, Washington

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PREPARED FOR

WASHINGTON STATE DEPARTMENT OF ECOLOGY
SHORELINE, WASHINGTON

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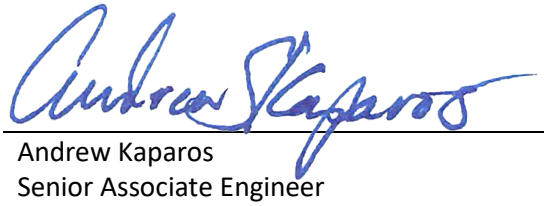

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1. Introduction

1.1 SITE SUMMARY

On behalf of the Washington State Department of Ecology (Ecology), Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this remedial investigation work plan (RIWP) for the Treoil Industries property (Property). The Property is located at 4242 Aldergrove Road (Cleanup Site ID number 950) and is approximately 5 miles northwest of the City of Ferndale, Washington, and 8 miles south of the Canada-United States border (Figure 1). The industrial operations are believed to be concentrated within an approximate 3.5-acre section of the total 34.24-acre property. The Property is owned by the Campbell Land Corporation and Mr. Jagroop S. Gill.

The proposed site investigation will address data gaps identified by Haley & Aldrich. The new data will eventually be used along with current data to prepare a Remedial Investigation (RI) report for submittal to Ecology. The RI will evaluate the nature and extent of environmental contamination associated with historical uses at the Property.

1.2 PROJECT BACKGROUND

The Treoil Industries Biorefinery was used historically for numerous industrial operations, primarily for processing tall oil, but also for refining biodiesel and other small-scale industrial ventures. Tall oil is a byproduct of kraft paper processes and contains various wood components including pitch, pine oil, fatty and resin acids, and other wood breakdown byproducts. It is used commercially as an emulsifier for asphalt, in adhesives, inks, and rubber products. During its business operations over the decades, the Site has been the focus of several environmental compliance concerns and inspections dating back to the late 1980s and continuing to present day. Additional detail regarding the regulatory history and previous investigations is found in Section 3.

1.3 REGULATORY FRAMEWORK

The RIWP will be implemented in general accordance with guidance put forth in the Model Toxics Control Act (MTCA), as stipulated in Washington Administrative Code (WAC) 173-340 and Agreed Order Docket number 11685. The investigation results will be used to prepare an RI report for the Site and, subsequently, a Feasibility Study (FS) consistent with guidance put forth in MTCA. Under MTCA, an RI is required to be developed once a Site is prioritized for remedial action (WAC 173-340-350; Ecology 2007). The purpose of the RI reports is to evaluate the nature and extent of environmental contamination at the Site and remedial options and recommend a cleanup action, as described in WAC 173-340-360 through 173-340-390, based on the collection, development, and evaluation of a sufficient site-specific data set.

1.4 PURPOSE AND OBJECTIVES

The purpose of this RIWP is to document the scope, technical approach, and implementation details for completing the RI. The purpose of the RI is to generate data of sufficient quality to characterize the nature and extent of impacts in environmental media (the Site), including soil, groundwater, and surface water; to evaluate data relative to appropriate screening levels; and to support an evaluation of potential cleanup actions. The objective of the RI process is to identify any new or previously

undiscovered contaminants of potential concern (COPCs) at the Site and their source(s) and extent. The primary COPCs appear to be metals and hydrocarbons associated with tall oil, biodiesel, and other COPCs commonly found with such as other intermediate and/or and heavy fuel oils. Field analyses performed in the 2017 and 2022 mobilizations identified the following chemicals at the site as well: arsenic, lead, sulfuric acid, potassium hydroxide, sodium hydroxide, ammonium chloride, formaldehyde, cupric sulfate, paradichlorobenzene, triethanolamine, glycol ether, xylene, toluene, polychlorinated biphenyls (PCBs), and other chemicals. Although many chemicals and hazardous wastes were removed from the site in the 2017 and 2022 mobilizations (as discussed in Section 3), the history of site use and maintenance observed to date suggests that some of these contaminants may still persist in the soils and surface/groundwater.

This RIWP provides an overview of pertinent background information, an initial evaluation of existing data for the Site (including a preliminary Conceptual Site Model [CSM]), the identification of data needs to support the risk assessment and evaluation of remedial alternatives, and a scope of services designed to address the identified data needs.

1.4.1 Remedial Investigation Report Organization

This RIWP for the Site complies with MTCA requirements and is organized as follows:

- **Section 2.0 - Background and Physical Setting:** Provides background information of the Site, including current and historical land use, surface features, and local geology and hydrogeology.
- **Section 3.0 - Previous Investigations and Data Evaluation:** Details past investigations and remedial work performed at the Site and cultural and natural resources present on the Site.
- **Section 4.0 - Preliminary Screening Levels and CSM:** Presents the preliminary CSM for the Site, potential sources, fate and transport of COPCs, and human and ecological exposure pathways.
- **Section 5.0 - Remedial Investigation Activities:** Presents the sampling objectives and approach as well as the scope and data collection activities.

2. Background and Physical Setting

The background and physical setting information summarized below are based on site visit reports from the Environmental Protection Agency (EPA), Ecology representatives, and from reports produced by the consulting firms Weston Solutions (Weston) and Ecology and Environment, Inc. (E&E). On 23 May 2023, a site reconnaissance visit was conducted with Ecology representatives to further evaluate current site conditions following the fall 2022 EPA removal action and request from Ecology to the property owner that the staged vehicles be removed.

2.1 SITE DESCRIPTION

For the purposes of this RI, Haley & Aldrich is choosing to perpetuate the naming conventions from the 2017 Final Trip Report (E&E, 2017) and the 2023 Removal Action Report (Weston, 2023).

The Property is comprised of one 34.24-acre parcel (#3901083260850000 of Whatcom County) currently owned by the Campbell Land Corporation. According to Whatcom County property records, the Property was previously owned by the Burlington Northern Railroad prior to 1988. Treoil Industries Ltd. owned the property between 1988 and 1994, at which point the deed transferred to the Campbell Land Corporation.

The Property is approximately 4 miles north of the Lummi Reservation and has been designated as a potential location of cultural and archaeological significance. Currently the Property is zoned as Major/Port Industrial Urban Growth Area (UGA). Several residential homes are located less than half a mile to the east of the Property.

As shown on Figure 2 and as depicted extensively in the 2017 Final Trip Report (E&E, 2017) and the 2023 Treoil Removal Action Report (Weston, 2023), the former working area of the Property features consists of two primary warehouse buildings, designated as Warehouses A and B. Warehouse A is a larger 6,400-square-foot building (oriented east to west), and Warehouse B is a smaller 3,600-square-foot building (oriented north to south). Warehouse B is located approximately 40 feet north of Warehouse A and is adjacent to the western fence line of the working area. Along the western and southwestern portion and within the fence line there are four dilapidated mobile home structures, two of which are partially collapsed. Adjacent to the northeast corner of Warehouse B is a distillation tower with ancillary equipment and structures. Originally, there were three separate tank farms within secondary containments (although the secondary containments were at least partially pervious which would have potentially allowed impacted water and/or products to penetrate the containment and enter the subsurface). Following the 2017 and 2022 removal actions, all three secondary containments have been decommissioned and all aboveground storage tanks (ASTs) removed. Several large mixing and boiler tanks, the distillation tower, and some of the associated piping still remains.

The former working area contains crushed gravel in some drivable roadways surrounding the warehouses, and during the 2022 removal actions, roadways were improved with the imported gravel. The majority of the area is vegetated, and therefore, the former locations of several ASTs were directly on soil and vegetated ground.

The Property was previously believed to be abandoned; however, between the 2017 and 2022 EPA visits to the Property, evidence of activity in the presence of newly abandoned/wrecked vehicles was

observed. Although the vehicles were removed per the request of Ecology, ongoing site security remains a concern.

2.2 PREVIOUS REGULATORY INTERACTIONS

Site soils, groundwater, and surface water have likely been impacted by a variety of contaminants including gasoline-, diesel-, and/or heavy oil-range total petroleum hydrocarbons (TPH-G, TPH-D, and TPH-O, respectively), petroleum-derived volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, and total xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs) and other semi-volatile organic compounds (SVOCs), and heavy metals. Materials previously removed from the Site found that metals, petroleum constituents, and PAHs exceed their respective MTCA Method A and/or B cleanup levels in soils (and are suspected to be in exceedance for groundwater and surface water). PCBs were also detected in at least one sample (but below MTCA cleanup levels).

Though several cleanup actions have occurred in recent history at the Property, based on observed site conditions, additional soil, groundwater, and surface water investigations are warranted. Impacted soil is believed to be present beneath and adjacent to former AST locations and adjacent to (and possibly beneath) former containments. Groundwater impacts could have derived from numerous stained soil areas and/or known and unknown historical releases. Previous Site investigations and desktop review indicate that a shallow water table is present in the area. This is evident in the significant presence of surface water and in adjacent wetlands abutting the active portions of the Property. Hydraulic connections from the active portions of the Property include three drainage ditches that connect with an unnamed intermittent stream that ultimately discharges into the Strait of Georgia, an important marine habitat in the area.

Initial Spill Detection:

- 1989 and 1994 - Ecology Water Quality Program files indicate a history of spills and poor maintenance operations at the Site, as recorded in the 1994 Site Hazard Assessment Inspection. An adjacent facility observed spilled oil seemingly originating from the Treoil Site, as recorded in the 1991 Ecology Notice of Violation.
- October 1991 - Ecology issued a Notice of Violation to facility operators for the discharge of approximately 1,000 gallons of spilled materials to a drainage ditch that eventually leads to the Strait of Georgia, a navigable water of the United States. The material spilled was described initially as “pine oil” in Ecology’s documents but has since been referred to as “tall oil.” The facility operators were not aware of the spill and were alerted by an adjacent facility.
- August 1992 - During a follow up visit to ascertain whether Treoil Industries was continuing to discharge without a National Pollutant Discharge Elimination System (NPDES) permit, evidence of oil contamination remained from an old spill surrounding the north sump. Oily sludge was also visible next to an empty drum that was staged near scattered solid waste piles.
- May 1994 - Following review by Ecology and under MTCA Chapter 70.105D RCW, the Treoil Industries Site was listed on the Confirmed and Suspected Contaminated Sites List.

Site Hazard Assessment (SHA):

- March 2000 through February 2001 - The Whatcom County Health & Human Services (WCHHS) and Ecology conducted a site inspection, collected samples, and performed a Site Hazard Assessment. The Site was listed on the Hazardous Sites List for confirmed contamination of soils

with metals, petroleum hydrocarbons, and PAHs. Numerous substances identified in the industrial processing of tall oil impact fish mortality, elevating the concern of contamination due to the proximity and hydraulic connection to the Strait of Georgia. The environmentally hazardous sites are ranked between 1 and 5, where 1 represents the highest level of risk to human and environmental health and a 5 the lowest; the Treoil Site was ranked with a score of 2. The Site was referred to Ecology's Spill Response Team as well.

Water Quality Inspection and State Environmental Policy Act (SEPA) Checklist Review:

- July 2006 - Inspectors from the following agencies visited the site to review and identify the contaminants: Ecology's Northwest Regional Office (NWRO), Whatcom County Planning and Development Services, WCHHS, and Northwest Clean Air Agency. The site operators were communicating plans to address the contamination complaints and develop the site for biodiesel production; this was also evident in the SEPA Checklist submitted by TG Energy, Inc.

New Spill Reported:

- June 2014 - Complaint filed by Ecology using the Environmental Report Tracking System (ERTS), regarding observed oily substances covering the ground over a large portion of the Site. Documented concerns regarding soil, air, groundwater, and surface water pollution from refinery processes as well as other industrial wastes. No evidence that any SEPA Checklist or previously reported compliance concerns were addressed and photographs from the Inspection Report identified several newly discovered areas of potential contamination. These areas included the entirety of the driveway, where oil was observed beneath new gravel, and a large pit outside of the western property fence line.

Formal Complaint Received:

- 2014 - Formal complaint received about the Site, prompting several inspections by Whatcom County Health Department and Ecology's Hazardous Waste and Water Quality programs.
- July 2015 - Ecology issues Administrative Order #11685 (amended in September 2015, #12892) requiring actions at Treoil because of noncompliance with several federal and state Hazardous and Dangerous Waste Regulations as pertaining to Washington Administrative Code (WAC) Chapter 173-303.

EPA Assessment and Emergency Removal Action:

- 2017 - Ecology and E&E support the EPA Emergency Removal Action (also called the Removal Site Evaluation, RSE) conducted under Superfund Technical Assessment and Response Team (START) contract #EP-S7-13-07, Technical Direction Document #17-03-003 and #17-01-0012. Two site mobilizations occurred between March 13 and April 7, and July 25 through August 4, as follow-up to the series of investigations and compliance concerns performed by Ecology. The comprehensive investigative process included photograph documentation, field sampling, waste characterization, and cleanup activities. Part of these investigations included mapping potential contamination pathways from the Site to waters of the United States. Approximately 90,000 gallons of tall oil, a byproduct of kraft processes and used commercially in rubber products, inks, adhesives, and as an emulsifier in asphalt, product were removed while many areas of concern remained on site. Spill protection mechanisms were installed where feasible.

- March 2022 - The EPA performed a site walk to document current site conditions since their previous removal actions, observations of recent site activities, identify any new potential areas of concern, and evaluate whether additional action is warranted. Since 2017, recent activities have occurred including increased volumes of an unknown oily product in two ASTs (T-1 and T-3), Secondary Containment C further deteriorated, two new burned soil areas were observed (not including the one area outside of the western fence line), and numerous inoperable vehicles have since accumulated on site that have been picked over for salvage/scrap.

- June 2022 – The EPA mobilized to the Site to follow-up on the March site visit and collected characterization samples from numerous tanks and from oil-saturated soils adjacent to actively leaking tanks. The oily water collected in secondary Containment C was also collected. The purposes of the mobilization were to update the understanding of current site conditions as well as characterize and approximate waste streams and volumes for remediation and removal.

- September 2022 – The EPA mobilized to the Site and removed 59 tanks in total from the Property, remediating their contents on site utilizing diatomaceous earth. The three secondary containments were drained and decommissioned to prevent further accumulations of impacted water. Some surface soils were removed where oily saturation was observed, specifically adjacent to identified leaking valves and ASTs; the cumulative tonnage of excavated solid materials, including site soils, solidified tall oil, non-hazardous sludge, and non-RCRA debris totaled approximately 3,038 tons. Following the removal of the largest secondary containment, 4 soil test pits were excavated to a depth of 36 inches to evaluate the potential extent of the leak. Additionally, a total of 96 orphan containers of miscellaneous size were categorized and removed. Between the demobilization of EPA and the Haley & Aldrich site visit, Ecology requested through the property owner that the inoperable vehicles be removed and by May 2023 the vehicles were gone.

2.3 ADJACENT SITES

Haley & Aldrich completed a search of Ecology's online environmental databases and reviewed records for any listed sites within a 1-mile radius of the Site. The findings of the records review indicated a small industrial gas facility and the BP Cherry Point petroleum refinery approximately 0.5 mile to the west of the Site.

Bordering the eastern and southern edges of the Property is a Burlington Northern Santa Fe Railway line. There are no reported regulatory database listings related to the presence of the railway within 1 mile of the Site. The Property and immediately adjacent sites are currently zoned as Major/Port Industrial UGA; however, as noted above, there are also several residential homes located to the east.

2.4 PHYSICAL SETTING

The Property is in the general vicinity of Cherry Point and is approximately 4 miles from the Lummi Reservation, and 6 miles from the city limits of Ferndale. Due to the proximity to the Lummi Reservation and the potential cultural significance of the Site, subsurface investigations have been limited.

2.4.1 Geology

The topography of the region is generally flat. The Geologic Map of the Bellingham 7.5-Minute Quadrangles, Whatcom County, Washington (Lapen, 2000) indicates that the Property is likely underlain

primarily by Emergence (beach) deposits. Soils common to the region and likely occurring on the Property are generally silt and sandy loams. During the EPA Removal Action, the oily gravel layer was approximately 3 inches thick and was underlain by an approximately 1-foot-thick uniform, gray, sandy fill layer. A silt layer (believed to be native) was observed beneath the gravel and sand fill layers and is believed to have been acting as a confining layer (Weston 2023).

2.4.2 Hydrogeology

Based on the general topography, groundwater and surface water are inferred to flow southwest towards a wetland and larger drainage ditch. According to the 2017 Final Trip Report and investigations by the EPA, three smaller tributary ditches connect surface sheet flow towards this wetland. During site reconnaissance conducted May 2023, Haley & Aldrich observed a drainage swale with water east of the BNSF railroad and the updated approximate delineation can be seen in Figure 2. Due to the current lack of groundwater data, the true direction and depth of groundwater is unknown.

Haley & Aldrich reviewed Ecology's Watershed Characterization online database and reviewed the hydrological importance of the Site. The Site is designated as a High Importance for both surface water storage and discharge. These designations are either based on the relative importance of the river floodplains intersecting permeable geologic deposits and/or the presence of depressional or sloping wetlands.

2.4.3 Wetlands

Due to the general area topography, high surface water presence, and proximity of the abutting forested wetlands to the west and south of the fence line, there may also be wetlands present on the Site itself. A desktop review of the National Wetlands Inventory indicates that the entire area of the Site is emergent wetland and approximately the western half of the Property is forested wetland.

On 28 January 2015, Ecology collected two sample data points west of the fence line. According to their data sheets and as verified during site reconnaissance, the area immediately adjacent to the Site is a palustrine emergent (PEM) wetland. Wetland hydrology indicators observed are High Water Table (A2) at a depth of 2 inches at one sample point, Saturation (A3), and Hydrogen Sulfide Odor (C1). The dominant vegetation within the wetland is reed canary grass (*Phalaris arundinacea*), a Class C non-native wetland grass. The hydric soil indicators observed are Hydrogen Sulfide (A4) and Depleted Below Dark Surface (A11). In additional remarks, Ecology noted evidence of additional water coming from the northwest side of the facility. The Ecology delineation also noted that in the eastern portions of the PEM wetland, it appears that fill was placed and impacted the integrity of what they deemed a marginal wetland in areas.

An additional field investigation was conducted 6 March 2017 to further identify how surface flow that was originating from the Site and connected to the wetland in relation to two identified sumps. These contributing hydrologic connections can also be seen on Figure 2, in addition to the approximate connecting drainage swale that crosses beneath the railroad tracks via culvert and continues to the northeast of the tracks.

3. Previous Investigations and Data Evaluation

3.1 SITE INVESTIGATIONS

The following sections summarize previous evaluations, inspections, and investigations conducted at the Property.

3.1.1 Site Hazard Assessment and Removal Site Evaluation: 2000 to 2001

In March 2000, representatives from Ecology and WCHHS conducted a site inspection due to the history of compliance issues reported at the site. In conjunction with these efforts, the EPA also conducted its RSE.

At the time of their inspection, the Site appeared abandoned. Ecology and WCHHS collected a preliminary inventory of materials on site, including about 60 to 70 ASTs and/or vessels, 300 drums and their statuses at four various staging locations within the Property and outside of the fence line. The drums were observed in many conditions: empty and corroded, some were partially full, some were leaking, and some were bulging. A rosin-like material was observed in soils and in numerous dilapidated fabric totes also north of the fence line (this material was also noted during the most recent site visit at several locations). Sand and grit blackened from blasting was observed on the east side of the eastern containment area. Deteriorating yellow-orange insulation material, suspected at the time to contain asbestos, was also observed and sampled. Abandoned vehicles were also inventoried including several smaller vehicles, two mobile truck-mounted cranes, one trailer-mounted air compressor, and two mobile-home sized trailers. One of the trailers appeared to have been used as a laboratory and the other contained miscellaneous materials. In several areas of the Site, samples were collected of the thick, viscous amber to dark brown liquid.

One of the buildings (identified in the inspection report as Building 1, also known as Warehouse A) was presumed to be utilized for metal fabrication operations. The metal operations included a more recently constructed propane tank and a large volume of copper slag sandblast grit northeast of the largest secondary containment.

Warehouse B (identified in the inspection report as Building 2) was inaccessible at the time of their inspection. Ancillary operations that most likely occurred at the Property due to intrinsic tall oil processing, for example boiler and equipment maintenance, process chemistry, and other feed chemicals were unknown. The end fate of any cooling water presumably used during tall oil processing was also unknown.

Sample results exhibited concentrations of lead, PAHs, and TPH above MTCA cleanup levels. Evaluation of potential routes of exposure prioritized the further investigation and cleanup of contaminants in soils and surface waters given the hydraulic connectivity to nearby waterbodies and the potential impacts to aquatic organisms.

3.1.2 Site Inspection - 2014

Following up on a series of complaints regarding evidence of contamination (#ERTS 648824 and FSID# 2919, SHA Ranked 2), in June 2014, representatives from the WCHHS and Ecology Water Quality

(WQ) group visited the Site. Since no tall oil processing activities were known to have occurred between the RSE in 2000 and the 2014 Site inspection, the presence of several newly uncovered areas of contamination suggests that the information previously provided to the EPA may have been inaccurate. Though no additional samples were taken, updated photographs of Site conditions resulted in direct Determination of Violations and Orders to Comply with Administrative Order Docket #11685 and Amended Order Docket #12892.

3.1.3 Final Trip Report - 2017

Under Superfund Technical Assessment and Response Team (START) contract #EP-S7-13-07 and Technical Direction Documents #17-03-0003 and #17-01-0012, E&E and the EPA conducted an emergency removal action at the Treoil Industries Site in two phases in 2017. E&E and EPA representatives collected logbook entries and photographic documentation of Site conditions and investigated, assessed, and characterized unknown chemical and hazardous wastes present. In total, 315 total hazard categorization tests were conducted, 150 chemicals/containers were determined as oil materials, and 165 chemicals were determined as hazardous substances. Many containers and structures were determined to be in a compromised and unsound state and/or stored improperly. Documentation of these improperly labeled and stored materials, evidence of the threat and occurrence of chemical releases, as well as the unsound status of secondary containments for the numerous ASTs on site was documented. In total, 35 ASTs were located outside of secondary containment with an additional 15 tanks inside of secondary containment. Many of these tanks were either empty or degraded to the point that they no longer were capable of containing material. Areas of suspected impacted soils were documented at the time of each mobilization; however, with considerations to the proximity of the Lummi Reservation and potential areas of cultural significance, no soil investigations were conducted during the RSE.

In addition to the broad chemical assessment, EPA also evaluated potential oil flow pathways from the Site via the west and southwestern sumps and the abutting wetlands. Three discrete surface water channels flow through the wetland area prior to entering the drainage ditch that runs parallel to the train tracks. This drainage ditch ultimately discharges to the Strait of Georgia, approximately 1 mile away.

3.1.4 EPA Investigatory Sampling, Email Correspondence - June 2022

Following the EPA March 2022 site walk to evaluate the updated site status since the 2017 emergency removal action, an EPA team mobilized to the site and sampled numerous tanks, collected oily water in secondary containments, and impacted soil adjacent to tanks 1, 2, and 3. The team also approximated total volumes of accumulated product and impacted materials with the purposes of remediation and disposal.

3.1.5 EPA Removal Action and Report - 2023

In September and October 2022, EPA and Weston conducted a Removal Action under the START contract TO Nos. 68H0722F0129 and 68HE0722F0130. Weston and EPA representatives prioritized the removal and/or remediation of contaminants related to the remaining 46 ASTs and the 3 secondary containments. Additionally, 90 total abandoned chemical containers were also profiled and removed. The grey and red incinerators were each sampled for Target Analyte List (TAL) Metals and determined to

be below regulatory action levels and thus were permissible to remain on site. Two tanks, Tank 7 and Tank 19, contained a sludge/solid material and were sampled due to toxicity concerns.

Soil grab samples were collected following the removal of the Containment C adjacent to the northeast, northwest, and southeast corners and in the center with the intent to determine if the secondary containment had impacted the soil beneath. The sample results indicated that contaminants of concern in the material beneath Containment C were below regulatory action levels. Additional details were provided above in Section 2.2.

3.2 CULTURAL AND NATURAL RESOURCES

3.2.1 Cherry Point and the Lummi Tribe Nation

During previous Site investigations, subsurface excavations were performed in accordance with National Historic Preservation Act. Ecology, EPA, and E&E all communicated with representatives from the Washington State Historic Preservation Office (SHPO) and the Lummi Nation Tribal Historic Preservation Office (THPO) to inform the potential for excavation activities required on Site. EPA consulted with the Lummi Nation and determined that the Cherry Point area historically had many pre-contact village sites; and therefore, encountering significant cultural artifacts in the soil during RSE work operations was possible. EPA determined no subsurface investigations were to take place during the RSE, except for the excavation adjacent and beneath the leaking Tank 50 during the Phase II mobilization (performed under the observation of the Applied Archeological Research, Inc.).

Prior to the subsurface excavations for related to the decommissioning of Containment C in the 2022 removal action, an emergency consultation with the Lummi Tribe and Washington State Department of Archaeology and Historic Preservation occurred with EPA and Weston. The on-site work crew was made aware of the potential for subsurface cultural resources and stop-work measures were in place in the event any resources were discovered during excavation. No sensitive resources were encountered during the course of excavation adjacent to Containment C.

3.3 UNMANNED AERIAL VEHICLE (UAV)

START contracted Empire Unmanned from Hayden, Idaho to pilot the Unmanned Aircraft System (UAS) for three aerial surveys. The aerial surveys were completed before (15 September 2022), during (19 October 2022), and after (11 November 2022) site activities to photograph and document the removal progress. The aerial surveys predominantly focused on the active portions of the Site and no fly-overs were conducted of the remaining approximately 31 acres of the property.

Based on Property conditions observed by Haley & Aldrich during the site reconnaissance visit in May 2023, and in reviewing the aerial survey results from EPA, an additional UAS flight/survey is not warranted at this time. This may be worth revisiting in the fall or winter when leaves have dropped making the surrounding landscape more visible from the air.

3.4 TERRESTRIAL ECOLOGICAL EVALUATION (TEE)

The terrestrial ecological evaluation (TEE) process is required at all MTCA sites where there has been a release or threatened release of a hazardous substance that may pose a threat to human health or the environment. The purpose of the TEE is to evaluate whether a release of hazardous substances to soil may pose a threat to the terrestrial environment and allows us to determine what plants and/or animals

might be harmed by the contaminants at the site. Data collected by EPA and their consultant has been preliminarily reviewed and screened against the MTCA TEE table (Table 749-3). Based on the initial data evaluation and comparison to TEE table values, some additional sampling is warranted and has been proposed in this RIWP. The proposed investigation will support development of a site-specific TEE weight-of-evidence evaluation, consistent with WAC 173-340-7493, which will be conducted as part of this RI. Additional information is provided in Sections 4.5.2 and 5 below.

A simplified TEE is most likely not appropriate for this Site since the Property is largely vegetated, has wetlands present, and is in close proximity to the Strait of Georgia. The wetlands, trees, and their understory vegetation are likely comprised of plants native to the state of Washington. Haley & Aldrich is not aware of any planned changes for future uses of the Property. Given that the Site is surrounded by a natural area that (likely) provides ecological habitat, a site-specific TEE may be required. This will be further evaluated during the RI reporting.

4. Preliminary Screening Levels and CSM

4.1 PROPOSED SCREENING LEVELS

Preliminary Screening Levels (PSLs) for the Site have been proposed based on previous investigations conducted on the Property. The following MTCA PSLs for each media will be used for screening purposes in the RI. Proposed PSLs will be further refined as part of future RI data collection activities. The proposed subsurface investigations will be required to evaluate both the lateral and vertical extents of impacts to both soil and groundwater. As such, communications with both the Washington SHPO and Lummi Nation THPO will be required to ensure that the destruction of any artifacts of historic significance does not unintentionally occur. An Inadvertent Discovery Plan (IDP) has been prepared and included in this RIWP (Appendix C) and will be referenced and implemented during all subsurface investigation activities.

4.1.1 Surface Water

Surface water samples will be screened and compared to the MTCA Method B (freshwater) levels for surface water (including Applicable or Relevant and Appropriate Requirements [ARARs] under WAC 173-201A, the federal Clean Water Act, and 40 CFR 131.45).

4.1.2 Groundwater

Groundwater will be screened relative to MTCA Methods A and B drinking water criteria. If groundwater is shown to directly discharge into local surface water, the PSLs will be adjusted to account for this additional potential exposure pathway.

4.1.3 Soil

Although the Property is zoned industrial, there are several residences to the east. Therefore, for potential human health exposures, soil will be screened against Method B PSLs for unrestricted land use and drinking water protection. For some constituents such as petroleum and lead, MTCA Method A unrestricted screening levels will be used. The Method A values are for protection of human health via the direct contact or ingestion pathways and protection of groundwater via the soil-leaching-to-groundwater pathway. Additionally, proposed Site-specific Method B screening levels for petroleum may be calculated based on the volatile petroleum hydrocarbons and extractable petroleum hydrocarbons analyses (VPH and EPH, respectively). Additionally, soil quality data will be compared to ecological indicator soil concentrations for protection of terrestrial plants and animals (MTCA Table 749-3).

4.2 PROPOSED POINTS OF COMPLIANCE

The soil point of compliance (POC) is the depth below ground surface (bgs) at which soil cleanup levels (CULs) shall be attained. The standard POC in soil for human direct contact and for ecological receptors is 15 feet bgs throughout an entire site and the standard POC is all depths throughout a Site for protection of groundwater and surface water. The standard POC for protection of groundwater and surface water is preliminarily applied to soil and sediment on the Site.

Additional assessment of soil, groundwater, sediment, and surface water on the Site will inform final POCs on the Site. It is anticipated that the determination of whether soil is protective of groundwater will be assessed using a POC established for groundwater. Note that a conditional POC of up to 6 feet bgs may be established for ecological receptors, as this represents the interval that receptors are most likely to directly contact in the absence of anthropogenic or other disturbances (e.g., excavation bringing deeper soils to the surface).

For groundwater, the POC is the point or points where the groundwater CULs must be attained for a Site to comply with the cleanup standards. Groundwater CULs shall be attained in all groundwater from the POC to the outer boundary of the hazardous-substance plume. In accordance with (WAC 173-340-720(8)(c)), a conditional POC may be established if it is not practicable to meet the CULs throughout the site within a reasonable restoration time frame. A conditional POC for groundwater is not proposed at this time for the Site.

4.3 PRELIMINARY CSM

A CSM describes potential chemical sources, release mechanisms, environmental transport processes, exposure routes, and receptors for sources identified on the Site. The primary purpose of the CSM is to identify potential current and future pathways by which human and ecological receptors could be exposed to site-related chemicals. A complete exposure pathway consists of four necessary elements: (1) a source and mechanism of chemical release to the environment; (2) an environmental transport medium for a release chemical; (3) a point of potential contact with the impacted medium (referred to as the exposure point); and (4) an exposure route (e.g., soil ingestion) at the exposure point.

The preliminary CSM included herein is based on findings from previous investigations at the Site. The historical operations of the tall oil processing, the secondary containments and ASTs, associated piping, and the ancillary sand blasting operations likely contributed to contamination of soil and water at the Site. Contaminants in soil and groundwater at the Site have the potential to migrate through a number of pathways to the adjacent drainage ditch and ultimately the Strait of Georgia, resulting in possible exposures to human and/or ecological receptors. Data generated from this RIWP will be used to develop a comprehensive and updated CSM for the Site to be used during the RI and FS processes.

4.4 CONTAMINANT TRANSPORT AND EXPOSURE ROUTES

Possible contaminant transport routes from the Site were identified in the Final Trip Report (E&E, 2017), Removal Action Report (Weston, 2023), and during site reconnaissance. The primary transport routes generally include soil to surface water and soil to groundwater. The transport pathways could possibly result in exposures to ecological receptors within the Strait of Georgia, and potential human receptors via fish consumption. The following sections focus on the possible transport pathways and exposure routes from the Site.

4.4.1 Potential Sources and Release Mechanisms

Possible contaminant sources for the migration of tall oil-related products from the Site are due to the pulp kraft processing that occurred since the 1980s; unknown and known leaking secondary containments, staged drums, and miscellaneous abandoned vehicles and equipment scattered about the former working area; sand blasting grit related to metal processing in Warehouse A and on the eastern concrete pad; and possible other unknown sources. During the RSE and previous Site

investigations and inspections, regulatory representatives were misinformed by site contacts regarding the breadth of impacted areas; and therefore, there is the possibility of impacted areas as yet undiscovered on the Property. Additionally, between the RSE in 2017 and the March 2022 site visit, there has been evidence that the Site is still active in some capacity. Information gathered from previous work and this RIWP will be used to determine more specifically any possible sources and source locations.

4.4.2 Fate and Transport Processes

The fate and transport processes of tall oil and other petroleum-related products depends on the composition of the contaminants and environment affected by the contaminants. Data generated from the RIWP will be used to better understand the fate and transport processes at the Site. The most likely contaminant transport routes/pathways are described below.

4.4.3 Primary Transport Pathways

The primary mechanisms likely to influence the fate and transport of chemicals at the Site include natural biodegradation of organic chemicals; sorption to soil and sediment; advection and dispersion in surface and groundwater; volatilization of volatile chemicals from soil or groundwater to air; leaching of chemicals from soil to groundwater; and discharge of chemically impacted surface water, soil, groundwater, and sediment to surface water. The relative importance of these processes varies depending on the chemical and physical properties of the released contaminant. The properties of soil, sediment, and the dynamics of groundwater flow also affect contaminant fate and transport.

4.5 HUMAN HEALTH AND ECOLOGICAL EXPOSURE

4.5.1 Human Health Exposure Scenarios

Soil and surface waters with concentrations of COPCs above the CULs may present a potential exposure pathway to human and/or ecological receptors. The Property is zoned and operated industrially; however, due to the residential homes nearby to the east, we are conservatively assuming an unrestricted land use. The potential human exposure pathways for surface water at the Site include dermal absorption, ingestion, and vapor inhalation. The potential exposure pathways for soil at the Site include dermal absorption, ingestion, and inhalation of soil vapors.

The Site is partially covered with compacted gravel fill that according to previous inspections, contains suspected oils seeps at some locations. In other areas, tanks, drums, vehicles, and equipment were staged on vegetation or directly on soil. Due to the largely unknown lateral and vertical extent of impacts in both soil and surface water, the pathway is considered potentially complete for direct contact including both dermal absorption and ingestion.

Volatile contaminants may partition to the vapor phase in the suspected source areas through impacted subsurface soil or groundwater transport of dissolved-phase contamination. The air-filled pore space between soil grains in the unsaturated zone, or partially saturated zone, is referred to as soil gas or soil vapor. Volatile contaminants in soil gas may migrate into overlying buildings resulting in vapor inhalation exposures to building occupants. Because the Site currently does not have any occupied buildings, the exposure pathway for inhalation of volatile COPCs from soil gas is considered incomplete. However, future land use for the Site may change so this pathway will be further considered and evaluated during the RI.

The Property contains drainage ditches that discharge to the adjacent wetlands and ultimately the Strait of Georgia. Given the close proximity to the Site, there is potential for the COPCs to migrate downgradient of the suspected source area and impact sediment and surface water via groundwater discharge. However, the presence and lateral extent of any potential groundwater plume has not yet been verified or fully delineated. Therefore, the pathway for discharge of chemically-impacted groundwater to surface water and sediment in the Strait of Georgia, as well as any other downgradient receiving waterbodies or ancillary wetlands is considered potentially complete. However, these pathways will be further considered and evaluated during the RI.

4.5.2 Terrestrial Ecological Receptors

As described above, the need for a TEE must be considered in an RI. WAC 173-340-7940 through 173-340-7494 define the goals and procedures of a TEE, including determining whether a release of hazardous substances to soil may pose a threat to the terrestrial environment, characterizing existing or potential threats to terrestrial plants and animals. Due to the presence of known surface contamination outside of buildings and structures, as well as the proximity to high quality undeveloped habitat that is surrounding the Site, a site-specific TEE will most likely be required. Based on new data obtained from this RI, the selection of an appropriate evaluation method will be determined during the RI.

5. Remedial Investigation Activities

5.1 REMEDIAL INVESTIGATION DATA GAPS AND OBJECTIVES

The data gaps remaining after the investigations that have occurred to date are:

- **Data Gap 1.** The lateral and vertical extent of known soil contamination at the Site. Subsurface investigations have not been performed due to proximity to the Lummi Reservation and potential cultural significance in the area.
- **Data Gap 2.** The direction of groundwater flow and the extent of groundwater/surface water interactions. Currently, groundwater flow direction is inferred from topography and the location of adjacent drainages.
- **Data Gap 3.** The lateral and vertical extent of groundwater impacts at the Site. As previously mentioned, subsurface investigations inhibited obtaining knowledge of the scope of groundwater impacts.

5.2 SCOPE OF SERVICES

Based on all of the above, our proposed scope of services includes the following:

- Complete public and private utility locates to check for underground utilities and pipelines near the proposed sampling locations;
- Advance 14 borings to collect soil and grab groundwater samples;
- Install permanent groundwater monitoring wells in seven of the boring locations;
- Collect 24 grab surficial soil samples;
- Collect and field screen soil samples from explorations for selected chemical analyses.
- Conduct four groundwater monitoring events on a quarterly schedule. Each monitoring event includes collecting groundwater samples from and gaging newly installed monitoring wells.
- Analyze selected soil samples for total petroleum hydrocarbons – diesel range and heavy oil range (TPH-DRO) and gasoline range (TPH-G); VOCs; SVOCs; VPH and EPH; and select metals (arsenic [As], cadmium [Cd], copper [Cu], chromium [Cr], lead [Pb], mercury [Hg], nickel [Ni], and zinc [Zn]).
- Analyze selected surface water and groundwater samples for total petroleum hydrocarbons – diesel range and heavy oil range (TPH-DRO) and gasoline range (TPH-G); VOCs; SVOCs; and select metals ([As, Cd, Cu, Cr, Pb, Hg, Ni, potassium [K], sodium [Na], and Zn).
- Grab groundwater and surface water samples will also be analyzed total suspended solids;
- Up to four surface soil samples (located near Warehouse A) will be analyzed for PCBs. A sample of product/material dripping from the pipe near the distillation tower will be collected and also analyzed for PCBs;
- Up to four small hand dug test pits will be completed in the vicinity of B-05 to help determine the lateral extent of product material observed on the ground surface on 2 August 2023;
- Update the CSM to describe contaminant sources, exposure pathways, and potential receptors;

- Manage investigation-derived waste (IDW) by storing at the Site and disposing off-site to an appropriate disposal facility; and
- Prepare an RI Report discussing the analytical results and assessing risks to on- and off-site receptors via exposure pathways identified in the CSM.

5.3 FIELD ACTIVITIES

Field activities should be coordinated with subcontractors, including a subsurface utility locator, driller, analytical laboratory, and IDW waste hauler to complete this scope of services. Before field activities begin, the Underground Utility Notification Center should be notified, and boring locations should be cleared for subsurface utilities by private and public utility locators.

The attached Sampling and Analysis Plan (SAP; see Appendix A) will guide environmental field sampling and laboratory and field analytical quality procedures specific to this scope of services. Table 1 and 2 provide summaries of the proposed sample locations and analyses. The site-specific Health and Safety Plan (HASP; see Appendix B) is also attached. An IDP (see Appendix C) has also been developed and includes specific sections related to Washington State Historic Preservation Office (SHPO) and Lummi Nation Tribal Historic Preservation Office (THPO) concerns and best practices.

5.3.1 Acquiring Access Agreements and ROW Permits

An access agreement (order number 21-2-01292-37) was obtained by Ecology on April 11, 2022, to perform the RI activities at the Site. The access agreement expires on 11 April 2024 and is provided as Appendix D. None of the proposed investigatory locations are required on neighboring parcels; however, this may need to be reevaluated following initial results obtained from this RI.

5.3.2 Surface Soil and Surface Water Sampling

At approximately 24 locations, grab soil samples (labeled S-01 through S-24) will be collected from discrete locations in suspected source areas, as indicated on Figure 2. This preliminary surficial screening is proposed as a means to minimize potential impacts to this culturally sensitive area while also collecting valuable information. If surface water is present, grab water samples may also be collected from these locations. Soil samples will be collected using a hand auger or other hand tools. Grab soil samples will be collected from below the surface, to approximately 6 to 12 inches bgs (after scraping away the surface organic material/duff layer). For the purposes of this RIWP, we have assumed that up to 24 grab soil and 10 surface water samples will be submitted to an Ecology-accredited analytical laboratory for chemical analyses.

Soil sampling equipment will be decontaminated before it is used at each sampling location. Where disposable (one-time use) equipment is used, it will be properly discarded after use at one sample, and a new piece will be used for the next sample. Samples will be obtained by hand using a new, uncontaminated glove or with a decontaminated stainless-steel spoon, trowel, or knife. Soil samples will be collected for analysis of VOCs and TPH-G/VPH using EPA Method 5035A procedures. Unless otherwise directed by the selected analytical laboratory, additional soil will also be collected in an unpreserved glass jar for analysis of TPH-DRO, select metals (As, Cd, Cu, Cr, Pb, Hg, Ni, and Zn), and SVOCs.

5.3.3 Drilling and Subsurface Soil and Groundwater Sampling

All boring and monitoring well installation will be conducted by a driller licensed in the State of Washington. Borings will be advanced using a direct push drill rig. Fourteen borings will be advanced below the groundwater table which is assumed to be approximately 10 to 15 feet bgs. Borings will be advanced to a maximum depth of 30 feet bgs (depending on field conditions and observations by the geologist). Soil samples will be logged and collected in five-foot intervals. A minimum of three soil samples per boring will be submitted to the laboratory for chemical analyses. Two of these borings are proposed to investigate background levels intrinsic to the area. Grab groundwater (or reconnaissance) samples will be collected from the temporary borings (except for locations where a permanent monitoring well is being installed). Groundwater sample depths will be determined in the field based on observed soil stratigraphy. Groundwater samples will be collected directly from the borehole using low-flow sampling techniques.

Temporary borings will be abandoned by filling with hydrated bentonite chips or with bentonite grout to the surrounding grade, in general accordance with the Minimum Standards for Construction and Maintenance of Wells (WAC 173-160).

5.3.4 Proposed Monitoring Well Installations and Groundwater Monitoring

To further delineate the extent of impacts at the Site, eight monitoring wells will be installed at select boring locations. Figure 2 shows potential monitoring wells locations to assess the lateral distribution of contaminants. All monitoring wells will be installed and constructed in general accordance with the Minimum Standards for Construction and Maintenance of Wells (WAC 173-160) and as described below:

Construction. Monitoring wells will be constructed of 2-inch-diameter Schedule 40 PVC with 5 to 10 feet of screened casing. Boring and monitoring well depths will be determined in the field based on encountering groundwater. Screening depths will be placed/centered at the depth of encountered ground water. However, boring depth will be determined based on soil field screening results and depth of groundwater. If field screening results indicate that contamination may be present at depth, the borings may continue advancing to a maximum of 30 feet bgs and the monitoring wells would be completed after having delineated the vertical extent of contamination. A clean silica sand pack will be placed about 1 foot above the screened section, and a minimum 3-foot bentonite seal will be placed above the sand to within about 1 foot of the ground surface. A concrete surface seal will secure the base of a steel stick-up well monument. A watertight locking cap and lock will secure the wellhead, and bolts will secure the monument cover. All monuments will be permanently marked with well identification numbers. The top of the well casing will be surveyed to calculate groundwater elevations and flow direction.

Development. Following installation, monitoring wells will be developed at least 12 hours after construction. Each well will be developed by purging (or pumping) up to 10 casing volumes of groundwater from the well using a stainless-steel or disposable bailer and/or a submersible pump. Development will be considered complete after water from the well becomes visibly clear, 10 well casing volumes have been removed, or the well bails dry (whichever is less). Development water will be handled in accordance with Section 5.3.7.

Decontamination Procedures. Non-disposable sampling equipment and reusable materials that contact the soil or water will be decontaminated on site before and after use at each sampling location. Decontamination will consist of the following:

- Tap-water rinse (may consist of an equivalent high-pressure or hot-water rinse). Visible soil to be removed by scrubbing.
- Non-phosphate detergent wash, consisting of a dilute mixture of Liqui-Nox® (or equivalent) and tap water.
- Distilled-water rinse.

Decontamination fluids will be transferred to drums for management as described below in Section 5.3.7.

Quarterly Groundwater Sampling. The proposed new monitoring wells will be sampled no sooner than 12 hours after development. Quarterly groundwater sampling events will be conducted for the entire monitoring well network associate with the Site. For the purposes of the RIWP, we are assuming an additional three events (quarterly) of groundwater monitoring will be conducted following the installation of the monitoring wells and initial sampling event. It's anticipated that the final quarter of sampling will be performed the first week of April 2024, before the access agreement expires.

After the groundwater levels are measured, each well will be purged at a low flow rate using a peristaltic or submersible pump connected to disposable tubing. The tubing inlet will be placed approximately at the center of the well screen or if the water table is below the top of the screened interval, then the tubing inlet will be placed at the center of the monitoring well's water column. To assess the effectiveness of purging and verify that the water quality parameters have stabilized, field parameters including pH, dissolved oxygen, oxidation reduction potential, electrical conductivity, turbidity, and temperature will be measured by means of a flow-through cell. Purging will be considered complete when 3 casing volumes of water have been removed, the well purges dry, or field parameters stabilize to within 10 percent (whichever is less). If the well is purged dry, it will be allowed to recover before sampling is performed.

5.3.5 Soil Screening and Sampling and Documentation

Field personnel will collect soil samples generally at 5-foot intervals from the exploration. A minimum of three soil samples from each subsurface exploration will be submitted to the analytical laboratory for chemical analyses. Field screening will be performed on each sample for environmental impacts using physical observation, performing sheen tests, and measuring headspace vapor using a photoionization detector. Additional information for soil screening and sampling is detailed in the SAP (Appendix A).

Soil and other observations at each boring location will be documented on a boring log and in field notes by a geologist or hydrogeologist licensed by the State of Washington, or by a person working under the direct supervision of a Washington State-licensed geologist or hydrogeologist. Boring logs will include information such as the project name and location, the name of the drilling contractor, the drilling method, the sampling method, sample depths, a description of soil encountered, and screened intervals. Soils will be described using American Society for Testing and Materials designation D2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). The information will be recorded on a boring log form or in field notes.

Observations during well development activities should also be documented in field notes and forms. Observations will include, but are not limited to, groundwater levels, development water characteristics (e.g., color, turbidity, sheen), and development purge volumes.

5.3.6 Laboratory Analysis and Quality Assurance and Quality Control

Laboratory analyses should be completed by an Ecology accredited analytical laboratory consistent with the protocols described in the SAP (Appendix A). The SAP should guide aspects of laboratory and field analytical quality procedures and quality assurance/quality control (QA/QC) requirements for analytical sampling and analyses.

Soil and groundwater samples collected by field personnel should be submitted under standard chain-of-custody procedures and will be analyzed as described in the SAP. Laboratory data will be submitted electronically to Ecology in an electronic format compatible with their Environmental Information Management System.

5.3.7 Reporting

Upon completion of field work and data analyses, a RI report will be drafted for Ecology, which will summarize the field activities, sampling procedures, laboratory testing results, and provide an updated CSM. Documentation of the fieldwork, data validation and QA/QC will be provided, along with an evaluation of the analytical results, and recommendations for further assessment, if applicable. Following the completion of the RI report, a FS report with disproportionate cost analysis, and selection of a preferred remedial alternative will be prepared.

5.3.8 IDW Management

IDW will consist of excess soil cuttings, development and purged groundwater from borings and monitoring wells, decontamination water, and personal protective equipment. Soil IDW will be placed in labeled Department of Transportation (DOT)-approved, 55-gallon steel drums. Water IDW will be placed in separately labeled, DOT-approved, 55-gallon steel drums. Associated samples collected from the supplemental RI activities will be used to profile the IDW for disposal. As a contingency, IDW samples will be collected from the drummed soil and water and only analyzed if requested by the receiving disposal facility. Upon receipt of the results, the IDW will be appropriately disposed of at a permitted disposal or treatment facility. Copies of all disposal documentation (e.g., manifests, weight tickets) for IDW will be provided in the final report.

6. Limitations

Work for this project will be performed in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work will be performed. It is intended for the exclusive use of Ecology for specific application to the referenced property. This RIWP is not meant to represent a legal opinion. No other warranty, express or implied, is made.

References

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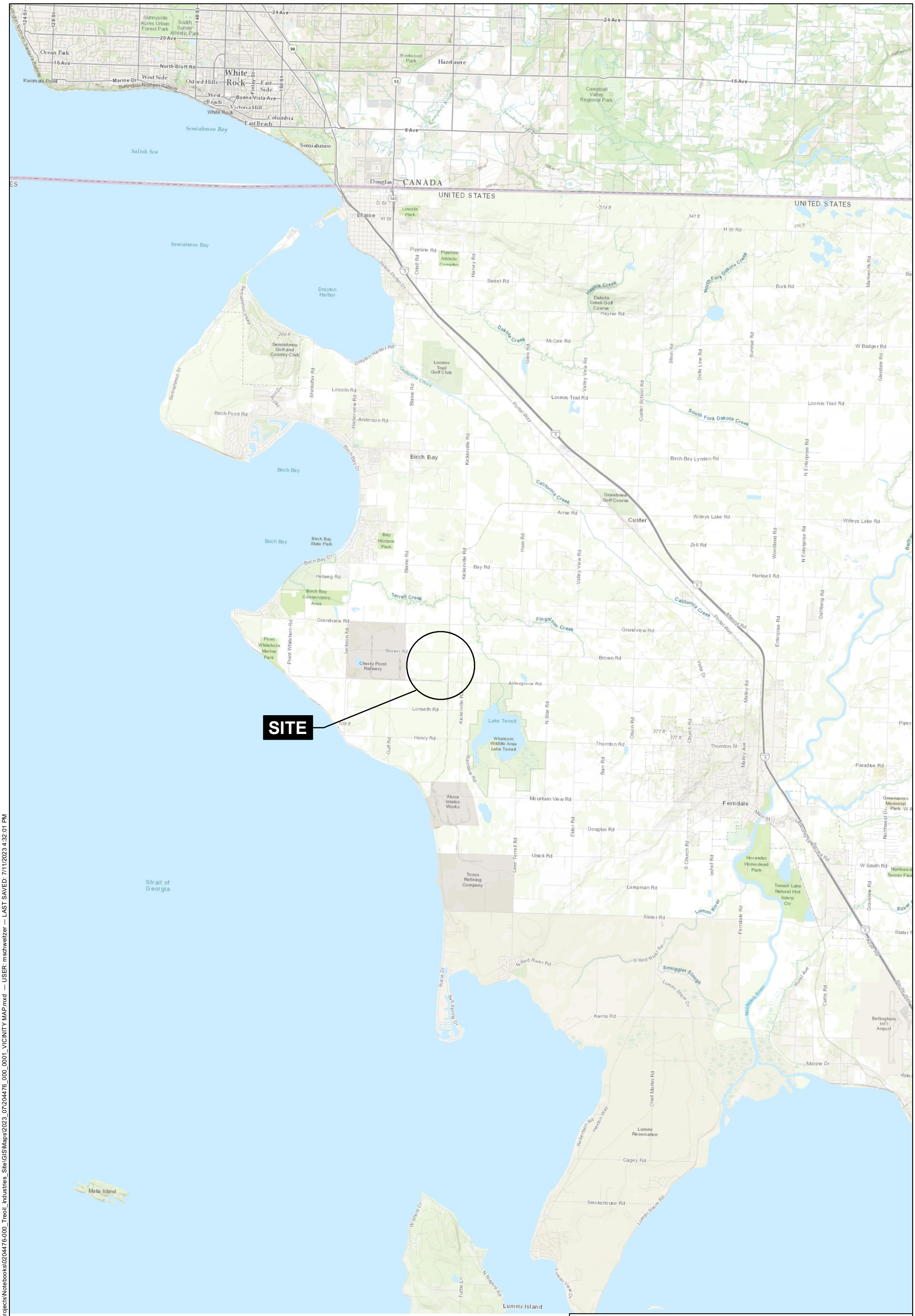
FIGURES



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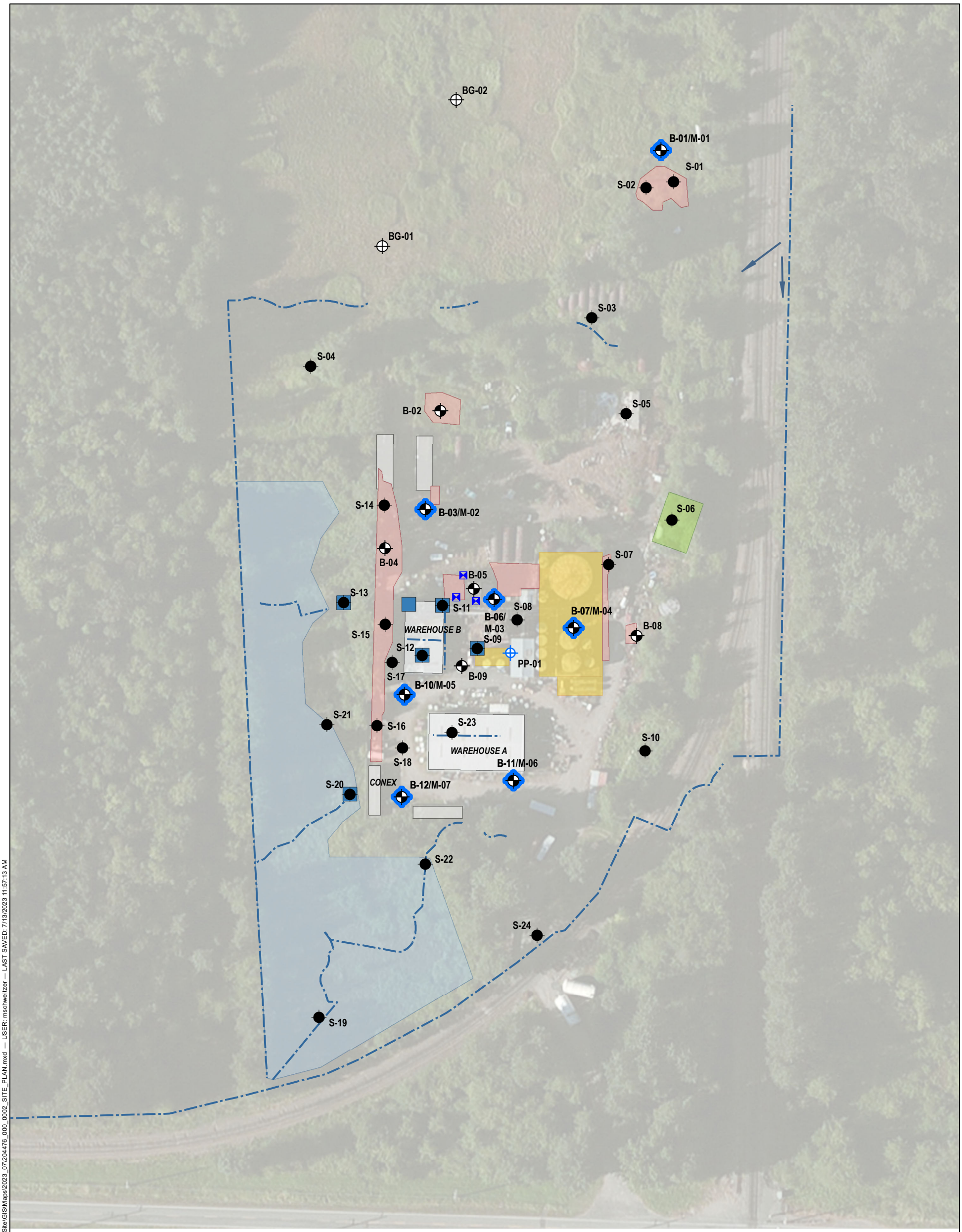

LEGEND

- PROPOSED SURFICIAL SOIL/WATER SAMPLE
- PROPOSED BACKGROUND SAMPLE
- PROPOSED RECONNAISSANCE BORING
- PROPOSED BACKGROUND SAMPLE MW
- PROPOSED MONITORING WELL LOCATION
- CATCH BASIN/SUMP
- STRUCTURE
- FORMERLY IDENTIFIED AREA OF STAINED SOIL
- SECONDARY CONTAMINANT
- SAND BLAST GRIT
- DELINEATED WETLAND
- DRAINAGE
- INFERRED GROUNDWATER FLOW
- PROPOSED TEST PIT LOCATION (NO SAMPLES TO BE COLLECTED)
- PROPOSED PRODUCT SAMPLE LOCATION

N

0 100 200

SCALE IN FEET

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. ALL FEATURES SHOWN WERE DIGITIZED FROM "FIGURE 6, IMPACTS TO SOIL," ECOLOGY AND ENVIRONMENT, INC., 2017.
3. AERIAL IMAGERY SOURCE: ESRI

HALEY ALDRICH

TREOIL INDUSTRIES SITE
FERNDALE, WASHINGTON

PROPOSED SITE CHARACTERIZATION SAMPLE PLAN

JULY 2023

FIGURE 2

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TABLES

TABLE 1 - PROPOSED SOIL SAMPLING PLAN
TREOIL BIOREFINERY
FERNDALE, WASHINGTON
0204476-001/001

Location ID	Rationale	Estimated Ground Surface Elevation (ft ASML)	Total Depth (ft bgs)	Sample Matrix	TPH-Dx	TPH-Gx	*VPH/EPH*	VOCs, SVOCs	Total Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, Zn)	PCBs
BG-01	To collect background data, upgradient from impacts to site.	8	30	Soil	6	6	1	6	5	
BG-02	To collect background data, upgradient from impacts to site.	8	30	Soil	6	6	0	6	5	
B-01/M-01	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils. During site reconnaissance rosin was observed in this area. Tank 50 was formerly located south of this area. M-01 will provide upgradient groundwater quality data.	8	30	Soil	5	5	1	5	5	
B-02	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	Soil	6	6	1	6	5	
B-03/M-02	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient of an area previously observed to have stained soils. The former laboratory trailers are also upgradient of this location. M-02 will provide groundwater quality data.	8	30	Soil	5	5	1	5	5	
B-04	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	Soil	6	6	1	6	5	
B-05	To investigate and delineate the vertical extents of the potential hydrocarbon contamination in an area previously observed to have stained soils. This area is adjacent to the distillation tower and during site reconnaissance there was product at the surface.	8	30	Soil	6	6	1	6	5	
B-06/M-03	To investigate and delineate the vertical extents of the potential hydrocarbon contamination in an area previously observed to have stained soils. This area is downgradient from the former Tanks 1 through 3 locations.	8	30	Soil	5	5	1	5	5	
B-07/M-04	To investigate and delineate the vertical extents of potential hydrocarbon contamination in soils beneath former secondary containment that was suspected to be leaking.	8	30	Soil	5	5	1	5	5	
B-08	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	Soil	6	6	1	6	5	
B-09	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from a former secondary containment.	8	30	Soil	6	6	1	6	5	3
B-10/M-05	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse B and secondary containment drainage path.	8	30	Soil	5	5	1	5	5	3
B-11/M-06	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse A. This area is also further downgradient from two of the former secondary containments.	8	30	Soil	5	5	1	5	5	3
B-12/M-07	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse A.	8	30	Soil	5	5	1	5	5	3

TABLE 1 - PROPOSED SOIL SAMPLING PLAN
TREOIL BIOREFINERY
FERNDALE, WASHINGTON
0204476-001/001

Location ID	Rationale	Estimated Ground Surface Elevation (ft ASML)	Total Depth (ft bgs)	Sample Matrix	TPH-Dx	TPH-Gx	*VPH/EPH*	VOCs, SVOCs	Total Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, Zn)	PCBs
S-01	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils. Tank T-50 was formerly in this location.	8	0.5	Soil	1	1		1	1	
S-02	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils. Tank T-50 was formerly in this location.	8	0.5	Soil	1	1		1	1	
S-03	To investigate and delineate potential hydrocarbon contamination in the former locations of Tanks 9 through 15.	8	0.5	Soil	1	1		1	1	
S-04	To support the terrestrial ecological evaluation (TEE).	8	0.5	Soil	1	1		1	1	
S-05	To investigate and delineate potential hydrocarbon contamination in the former Tank 6 location.	8	0.5	Soil	1	1		1	1	
S-06	To investigate and delineate potential heavy metals contamination in the former sand blasting area.	8	0.5	Soil	1	1		1	1	
S-07	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	0.5	Soil	1	1		1	1	
S-08	To investigate and delineate potential hydrocarbon contamination in an area that was adjacent to the central processing facilities.	8	0.5	Soil	1	1		1	1	
S-09	To investigate and delineate potential hydrocarbon contamination in the drainage sump adjacent to a former secondary containment.	8	0.5	Soil	1	1		1	1	
S-10	To investigate and delineate potential hydrocarbon contamination in an area where equipment and debris was stored at one point.	8	0.5	Soil	1	1		1	1	
S-11	To investigate and delineate potential hydrocarbon contamination in the drainage sump. Drainage sump connects to previously identified ephemeral drainage that is suspected to convey contaminants off the site.	8	0.5	Soil	1	1		1	1	
S-12	To investigate and delineate potential hydrocarbon contamination in the drainage sump. Drainage sump connects to previously identified ephemeral drainage that is suspected to convey contaminants off the site.	8	0.5	Soil	1	1		1	1	
S-13	To investigate and delineate potential hydrocarbon contamination in the drainage sump. Drainage sump connects to previously identified ephemeral drainage that is suspected to convey contaminants off the site.	8	0.5	Soil	1	1		1	1	
S-14	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	0.5	Soil	1	1		1	1	
S-15	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	0.5	Soil	1	1		1	1	
S-16	To investigate and delineate potential hydrocarbon contamination in an area that was previously observed to have stained soils and downgradient from secondary containment drainage path.	8	0.5	Soil	1	1	1	1	1	
S-17	To investigate and delineate potential hydrocarbon and PCB contamination adjacent to a decrepit electrical transformer.	8	0.5	Soil	1	1		1	1	1
S-18	To investigate and delineate potential hydrocarbon contamination adjacent to an area with stained soils and adjacent to where equipment was stored at one point.	8	0.5	Soil	1	1		1	1	

TABLE 1 - PROPOSED SOIL SAMPLING PLAN
TREOIL BIOREFINERY
FERNDALE, WASHINGTON
0204476-001/001

Location ID	Rationale	Estimated Ground Surface Elevation (ft ASML)	Total Depth (ft bgs)	Sample Matrix	TPH-Dx	TPH-Gx	*VPH/EPH*	VOCs, SVOCs	Total Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, Zn)	PCBs
S-19	To investigate and delineate potential hydrocarbon contamination at the further downstream of a previously identified drainage swale. Sample would be further downstream from S-22. Drainage is suspected to convey contaminants off the site. This will also support the terrestrial ecological evaluation (TEE).	8	0.5	Soil	1	1		1	1	
S-20	To investigate and delineate potential hydrocarbon contamination in the drainage sump. Drainage sump connects to previously identified ephemeral drainage that is suspected to convey contaminants off the site.	8	0.5	Soil	1	1		1	1	
S-21	To investigate and delineate potential hydrocarbon contamination within the delineated wetland west and downgradient from the site.	8	0.5	Soil	1	1		1	1	
S-22	To investigate and delineate potential hydrocarbon contamination at the start of a previously identified drainage swale. Drainage is suspected to convey contaminants off the site.	8	0.5	Soil	1	1		1	1	
S-23	To investigate and determine if any potential hydrocarbon, metals, PCBs, or caustic contamination remains in the trench in Warehouse A.	8	0.5	Soil	1	1		1	1	1
S-24	To investigate and delineate potential hydrocarbon contamination in an area where equipment and debris was stored at one point.	8	0.5	Soil	1	1		1	1	
TP-1	Hand dug test pit to determine lateral extent of ponded product material near shed and B-05	8	~1-2	N/A: no samples collected - just visual screening and observation						
TP-2	Hand dug test pit to determine lateral extent of ponded product material near shed and B-05	8	~1-2	N/A: no samples collected - just visual screening and observation						
TP-3	Hand dug test pit to determine lateral extent of ponded product material near shed and B-05	8	~1-2	N/A: no samples collected - just visual screening and observation						
	TOTAL NUMBER OF SAMPLES COLLECTED*:				101	101	14	101	94	14

*Note: not all collected samples will be analyzed by laboratory.

Duplicates:
Soil borings: Duplicate soil samples will be labeled FD01 (02, 03, etc.) -mmddyy and 30 minutes will be added to the sample time. The location and depth of the duplicate will be noted in the field logs.

TABLE 2 - PROPOSED GROUNDWATER AND SURFACE WATER SAMPLING PLAN
TREOIL BIOREFINERY
FERNDALE, WASHINGTON
0204476-001/001

Location ID	Rationale	Estimated Ground Surface Elevation (ft ASML)	Total Depth (ft bgs)	Sample Matrix	TPH-Dx	TPH-Gx	VOCs, SVOCs	Dissolved Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, K, Na, Zn)	Total Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, K, Na, Zn)	PCBs	Total Suspended Solids
BG-01	To collect background data, upgradient from impacts to site.	8	30	GW	1	1	1	1	1		1
BG-02	To collect background data, upgradient from impacts to site.	8	30	GW	1	1	1	1	1		1
B-01/M-01	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils. During site reconnaissance rosin was observed in this area. Tank 50 was formerly located south of this area. M-01 will provide upgradient groundwater quality data.	8	30	GW	1	1	1				
B-02	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	GW	1	1	1	1	1		1
B-03/M-02	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient of an area previously observed to have stained soils. The former laboratory trailers are also upgradient of this location. M-02 will provide groundwater quality data.	8	30	GW	1	1	1				
B-04	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	GW	1	1	1	1	1		1
B-05	To investigate and delineate the vertical extents of the potential hydrocarbon contamination in an area previously observed to have stained soils. This area is adjacent to the distillation tower and during site reconnaissance there was product at the surface.	8	30	GW	1	1	1	1	1		1
B-06/M-03	To investigate and delineate the vertical extents of the potential hydrocarbon contamination in an area previously observed to have stained soils. This area is downgradient from the former Tanks 1 through 3 locations.	8	30	GW	1	1	1				
B-07/M-04	To investigate and delineate the vertical extents of potential hydrocarbon contamination in soils beneath former secondary containment that was suspected to be leaking.	8	30	GW	1	1	1				
B-08	To investigate and delineate the vertical extents of potential hydrocarbon contamination in an area that was previously observed to have stained soils.	8	30	GW	1	1	1	1	1		1
B-09	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from a former secondary containment.	8	30	GW	1	1	1	1	1		1
B-10/M-05	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse B and secondary containment drainage path.	8	30	GW	1	1	1				
B-11/M-06	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse A. This area is also further downgradient from two of the former secondary containments.	8	30	GW	1	1	1				
B-12/M-07	To investigate and delineate the vertical extents of potential hydrocarbon contamination downgradient from Warehouse A.	8	30	GW	1	1	1				

TABLE 2 - PROPOSED GROUNDWATER AND SURFACE WATER SAMPLING PLAN
TREOIL BIOREFINERY
FERNDALE, WASHINGTON
0204476-001/001

Location ID	Rationale	Estimated Ground Surface Elevation (ft ASML)	Total Depth (ft bgs)	Sample Matrix	TPH-Dx	TPH-Gx	VOCs, SVOCs	Dissolved Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, K, Na, Zn)	Total Metals (As, Cd, Cu, Cr, Pb, Hg, Ni, K, Na, Zn)	PCBs	Total Suspended Solids
PP-01	To characterize product material found dripping from pipe in distillation tower.	15	--	Product	1	1	1			1	
SW-01 through SW-10	If and when water is encountered at the surface in select locations, a grab water sample will be collected in addition to a soil sample. No more than 10 surficial water samples will be collected.	8	--	Surface water	1	1	1	1	1		1
				TOTAL NUMBER OF SAMPLES COLLECTED*:	16	16	16	8	8	1	8

*Note: not all collected samples will be analyzed by laboratory.

Duplicates:
Grab Groundwater (GW) from borings: One duplicate grab groundwater sample will be collected from one location during the sampling event and labeled GW-mmddyy
MWs: One duplicate groundwater sample will be collected during each quarterly sampling event and labeled GW-mmddyy. The location of the duplicate will be noted.

APPENDIX A
Sampling and Analysis Plan

APPENDIX A
Sampling and Analysis Plan

1. Introduction

This Sampling and Analysis Plan (SAP) presents the proposed field activities, and sample collection procedures that will be used to complete the field work for a remedial investigation (RI) at the Treoil Industries Biorefinery site (Property), in Ferndale, Washington (Figure 1 of the RI Work Plan [RIWP]). Please refer to the attached work plan for a detailed description of the project and relevant Site background information.

2. Sampling Analysis Plan

2.1 FIELD SAMPLING PROCEDURES

2.1.1 Site Access

Ecology has executed an access agreement with the property owner to access the Property and perform the RI activities.

2.1.2 Utility Location

Prior to beginning any exploration activities, underground utilities must be located and marked, and the Washington Utility Notification Center should be contacted, who will in turn notify the various utilities in the area to mark any underground installations in the vicinity of the Site. Exploration locations will be adjusted, if necessary, to avoid any underground utilities that are identified. A private utility locate will also be arranged and coordinated by Haley & Aldrich.

2.1.3 Explorations and Soil and Grab Groundwater Sampling

Approximately fourteen borings will be advanced using a direct push drill rig. Most proposed borings will likely be installed to depths of approximately 15 to 20 feet below ground surface (bgs). However, if field screening indicates that contamination may be present at depth, borings can be advanced until the vertical extent of contamination has been delineated (up to 30 feet as described in the RIWP). As such, the drillers will be prepared with the necessary equipment to extend the borings to a depth of 30 feet. To prevent vertical migration of contaminants, an outer steel casing will be used to isolate specific stratigraphic intervals from zones above and below, as needed.

The decision to proceed to a greater depth will be based on field observations and screening data collected using a photoionization detector (PID), and the vertical extent of contamination is considered delineated after at least two successive soil vapor head space sample readings collected over a 5-foot vertical depth range which indicate that PID readings have returned to background concentrations, and that no odor or other indication of contamination is noted. Sampling procedures during boring advancement are discussed below.

2.1.4 Field Screening Techniques

Soils obtained from drilling explorations will be field screened for contamination through physical observation, performing sheen tests, and measuring headspace vapor using a PID. The effectiveness of field screening varies with temperature, moisture content, organic content, soil type, and age of the constituents. Soil screening tests may not be completed if limited soil volume is recovered. These techniques are discussed below.

Observation. For soil with relatively higher solvent concentrations there will likely be observable indicators of contamination. Soil may be stained or discolored so that it is visibly noticeable compared to typical soil colors. Sheens may also cause the soil to have a shiny or glossy appearance. Odors may also be present ranging from very faint to strong, and from sweet smelling to pungent. Odors are usually detected inadvertently during field activities and are usually noticeably different than typical odors in the air.

PID Headspace Measurements. Headspace vapor measurements will be made on soil samples using a PID with a 10.4 eV lamp to assess the possible presence of volatile organic compounds (VOCs). The PID is not compound-specific and only provides a semi-quantitative indication of the presence of VOCs. The PID measures concentrations in parts per million (ppm). Soil is placed in a Ziploc® bag (filled less than half full), sealed with some air, and allowed to warm to ambient temperatures. PID measurements are made within 30 minutes of collection by opening the bag slightly and inserting the probe into the air space in the bag. The highest PID measurement for each sample is recorded on the field logs.

Sheen Tests. A sheen test is a visual test to assess if a sheen is produced on water by the soil. A small portion of the soil sample is placed in a pan partially filled with water and the water surface is observed for signs of sheen. Sheens will be classified as follows:

- **No sheen (NS).** No visible sheen on water surface.
- **Slight sheen (SS)**. Light colorless film, spotty to globular; spread is irregular, not rapid; areas of no sheen remain; film dissipates rapidly.
- **Moderate sheen (MS).** Light to heavy film, may have some color or iridescence; globular to stringy; spread is irregular to flowing; few remaining areas of no sheen on water surface.
- **Heavy sheen (HS).** Heavy colorful film with iridescence; stringy; spread is rapid; sheen flows off the sample; most of the water surface may be covered with sheen.

2.1.5 Soil Boring Sampling

Soil samples will be collected from each exploration location. In general, soil samples will be collected for possible chemical analyses every 5 feet with a minimum of three samples per boring. Soil samples will be collected for lithologic description, field screening, and chemical analyses, as described below. The sampling locations from within the boring may be modified in the field (based on field screening) if needed to delineate the vertical extent of impacts in soil (i.e., to bound the contamination by collecting one sample above observed impacts, one from within the impacted zone, and one from beneath the suspected impacted zone).

Soil-sampling equipment will be decontaminated before it is used at each sampling location. Where disposable (one-time use) equipment is used, it will be properly discarded after use at one sample, and a new piece will be used for the next sample. Soil samples will be obtained by hand, using a new, uncontaminated glove; or with a decontaminated stainless-steel spoon, trowel, or knife. Soil samples

will be collected for analysis of VOCs and, total petroleum hydrocarbons – gasoline range (TPH-G), and volatile petroleum hydrocarbons (VPH) using Environmental Protection Agency (EPA) Method 5035 procedures. Unless otherwise directed by the selected analytical laboratory, a soil sample will also be collected in an unpreserved glass jar for analysis of diesel- and oil-range petroleum hydrocarbons (TPH-D and TPH-O, respectively), select metals (As, Cd, Cu, Cr, Pb, Hg, Ni, K, Na, and Zn), and polychlorinated biphenyls (PCBs) semivolatile organic compounds (SVOCs).

Select subsurface soil samples may be analyzed for TPH-G, TPH-D, and TPH-O analyses (sample material with the most apparent soil staining and/or other observed visual and olfactory impacts will be used for these expedited analyses). Following receipt and review of laboratory chromatograms, we will select roughly five samples that exceed the Method A TPH CUL for additional VPH and extractable petroleum hydrocarbons (EPH) analyses. If more than one petroleum type is encountered, we will have the laboratory analyze a minimum of three VPH/EPH tests for each product type at that sample location. For the purposes of this work plan, we have assumed a maximum of 15 VPH/EPH soil analyses will be performed.

The following options are considered industry-standard sampling techniques and may be used for soil sample collection. Soil samples will be collected directly from the soil cores from the borings. The sampling locations from within the boring may be modified in the field (based on field screening) if needed to delineate the vertical extent of impacts in soil (i.e., to bound the contamination by collecting one sample above observed impacts, one from within the impacted zone, and one from beneath the suspected impacted zone). To prevent cross-contamination between samples, samples will be collected from soil material that has not come into contact with drill casings and hand tools (and other sampling equipment) will be decontaminated between samples.

During drilling, a description of soil conditions and visual and olfactory observations will be recorded on boring logs by a geologist or hydrogeologist licensed in the State of Washington, or by a person working under the direct supervision of a Washington-State-licensed geologist or hydrogeologist in accordance with American Society for Testing and Materials (ASTM) Method D2488. Soil samples will be labeled according to the boring number and the order the sample was collected (e.g., B1-S1). The soil from temporary borings will be field screened for organic vapors using a PID and sheen testing will be performed. Soil and groundwater observations and sample parameters will be recorded on field sampling data sheets.

Sample containers will be packed in iced shipping containers (coolers) with chain-of-custody documentation (as described below) and delivered or shipped to the laboratory. One field duplicate soil sample will be collected for every 20 samples collected, preferably from areas showing signs of contamination. Duplicate soil samples will be labeled FD01 (02, 03, etc.) -mmddyy and 30 minutes will be added to the sample time. The location and depth of the duplicate will be noted in the field logs.

2.1.6 Grab Groundwater Sampling from Borings

Groundwater samples will be collected from discrete intervals during drilling to evaluate the vertical distribution of contamination. Groundwater sample depths will be determined in the field based on soil stratigraphy observations and field screening observations. When a boring enters a highly transmissive lens, drilling will cease. The outer steel casing used by drillers to prevent vertical migration of groundwater will be lowered to the transmissive zone. This should isolate groundwater from the desired transmissive zone. For borings that are not completed as permanent groundwater monitoring wells, grab groundwater samples will be collected directly from the borehole using low-flow sampling

techniques. For the purposes of this work plan, we have assumed that seven grab groundwater samples will be collected.

Prior to setting the screen and any groundwater sample collection and purging, field staff will measure and record the depth to water using an electronic water-level probe (an oil-water interface probe may be used if free product is observed in the boring).

Each temporary well will be constructed of a 1- or 2-inch-diameter Schedule 40 PVC casing with a 5-foot-long, 0.010-inch-slot capped, pre-packed screen and the top of the screen casing will be placed one foot above the observed water table. The well casing and screen will be lowered down the inside of the 2.25-inch drill casing and a clean silica sand pack (10/20 sand) will be placed between the boring wall and the PVC screen from the bottom of the well to approximately 1 to 2 feet above the screened interval, if a prepacked well screen is not used. The drillers will measure the open-hole depth outside the temporary well casing before and during sand placement to confirm the sand is being placed at the correct interval. If material has sloughed at the bottom, the drillers would remove any excess material until the bottom of the boring is at the requested depth.

The laboratory-supplied sample bottles will be filled directly from the polyethylene tubing at relatively low flow rates. Field filtering will be performed for the dissolved metals analysis. Groundwater samples will be labeled according to the boring number (e.g., B-01-GW). One duplicate grab groundwater sample will be collected from one location during the sampling event and labeled GW-mmddyy. The location of the duplicate will be noted. Laboratory analyses and methods are provided in Section 4.

To prevent cross-contamination of the wells, new disposable polyethylene tubing will be used for each groundwater sample location, and the water-level probe will be decontaminated between wells.

2.1.7 Documentation

Observations, field screening results, and sampling activities will be documented in field notes and forms. Boring logs will include information such as the project name and location, the name of the drilling contractor, the drilling method, the sampling method, sample depths, a description of soil encountered, and screened intervals. Soils will be described using ASTM D2488-00, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures). The information will be recorded on a boring log form or in field notes.

2.2 MONITORING WELL CONSTRUCTION AND DEVELOPMENT

Select borings will be completed as monitoring wells after soil screening and sampling are completed. These locations are identified in RIWP Figure 2. All wells will be installed and constructed in accordance with Washington Administrative Code (WAC) and Revised Code of Washington (RCW) rules and regulations.

2.2.1 Construction

Each monitoring well will be constructed of a 2-inch-diameter Schedule 40 PVC casing with a 5- to 10-foot-long, 0.010-inch-slot screen placed at the appropriate screen interval as determined during field conditions. A clean silica sand pack (10/20 sand) will be placed between the boring wall and the PVC screen from the bottom of the well to approximately 1 to 2 feet above the screened interval. A minimum 3-foot bentonite seal will be placed above the sand to within 1 or 2 feet of the ground surface.

A concrete surface seal will secure the base of a steel stick-up well monument. A watertight locking cap and lock will secure the wellhead, and bolts will secure the monument cover. All monuments will be permanently marked with well identification numbers.

2.2.2 Elevations

To calculate subsequent groundwater level elevations and flow direction, the tops of the well casings will be surveyed/measured to the nearest 0.01 foot by a licensed surveyor.

2.2.3 Development

Following installation, monitoring wells will be developed at least 12 hours after construction. The depth to water and depth to sediment in each well will be measured using an electronic water-level probe before starting well development. Wells will be developed by surging groundwater with a stainless-steel or disposal polyethylene bailer and pumping with a submersible pump until either (a) water from the wells becomes visibly clear, (b) turbidity measurements stabilize to within 10 percent for 3 successive casing volumes, (c) a minimum of 10 well volumes are purged, or (d) the well bails dry. See Section 2.8 for well development water storage and disposal.

2.2.4 Documentation

Observations and development activities will be documented in field notes and forms. Observations will include, but are not limited to, groundwater levels, development water characteristics (e.g., color, turbidity, sheens), and development purge volumes.

2.3 MONITORING WELL SAMPLING

If new monitoring wells are installed, they will be sampled no sooner than 12 hours after development.

2.3.1 Measurement of Groundwater Levels

Prior to purging, groundwater levels in the wells will be measured to the nearest 0.01 foot using an electronic water-level probe. The wells will be opened and allowed to equilibrate for up to a half hour before measurements are taken.

2.3.2 Purging

After groundwater levels are measured, each well will be purged at a low flow rate using a peristaltic or submersible pump fitted with clean, disposable tubing. The tubing inlet will be placed approximately at the middle of the well screen. Tubing will be used one time and disposed of as described in Section 2.8.3. To assess the effectiveness of purging, pH, electrical conductivity, temperature, dissolved oxygen, and oxidation-reduction potential will be measured by means of a flow-through. Results of these measurements will be included in the field notes. Purging will be considered complete when 3 casing volumes of water have been removed, the well purges dry, or field parameters stabilize to within 10 percent for three consecutive readings (whichever is less). If the well is purged dry, it will be allowed to recover before sampling is performed. Purge water will be handled in accordance with Section 2.8.

2.3.3 Sampling

After purging of a well is complete, a groundwater sample will be collected using the same equipment used for purging and low-flow groundwater sampling techniques. The laboratory-supplied sample bottles will be filled directly from the polyethylene tubing. Volatile Organic Analyte (VOA) containers will be filled leaving no headspace. One duplicate groundwater sample will be collected during each quarterly sampling event and labeled GW-mmddyy. The location of the duplicate will be noted.

As noted in Section 2.5.4, select monitoring wells will have samples analyzed for TPH-G, TPH-DRO, VOCs, SVOCs, and select metals.

2.3.4 Documentation

Observations made during groundwater sampling activities will be documented in field notes. Observations will include, but are not limited to, groundwater levels, purge water characteristics (e.g., color, turbidity, sheens), purge volumes, field parameter measurements, and sampling time.

2.4 SURFACE SOIL AND SURFACE WATER SAMPLING

Haley & Aldrich will collect up to 24 grab surface soil samples (labeled S-01 through S-24) from discrete locations in suspected source areas, as indicated on Figure 2. In the event that surface water is encountered, water samples (labeled as SW-1, SW-2, etc.) may also be collected from these locations. Soil samples will be collected using a hand auger or other hand tools. For the purposes of this work plan, we have assumed that up to 24 grab soil and 10 surface water samples will be submitted to the analytical laboratory for chemical analysis. Grab soil samples will be collected from below the surface, from approximately 6 to 12 inches bgs (after scraping away the surface organic material/duff layer).

Sampling equipment will be decontaminated before it is used at each sampling location. Where disposable (one-time use) equipment is used, it will be properly discarded after use at one sample, and a new piece will be used for the next sample. Samples will be obtained by hand using a new, uncontaminated glove or with a decontaminated stainless-steel spoon, trowel, or knife.

Soil samples collected for analysis of VOCs and TPH-G/VPH will be obtained using EPA Method 5035A procedures. Unless otherwise directed by the selected analytical laboratory, additional soil will also be collected in an unpreserved glass jar for analysis of TPH-DRO, select metals (As, Cd, Cu, Cr, Pb, Hg, Ni, and Zn), and SVOCs. Up to four soil samples within close proximity to Warehouse A will be analyzed for PCBs.

Surface water samples will be analyzed for TPH-G, TPH-D, VOCs, SVOCs, Total Suspended Solids (TSS), as well as total and dissolved metals.

2.5 PRODUCT MATERIAL SAMPLING

A pipe within the distillation tower area was observed to be leaking/dripping an oily product material during our site reconnaissance visit in May 2023. We plan to collect a sample of this product, if the pipe is still dripping during our RI field activities. The dripping pipe product will be analyzed for TPH-D Extended, TPH-G, metals, VOCs, SVOCs, and PCBs. The pipe product sample naming convention will be PP-01.

2.6 SAMPLE MANAGEMENT

2.6.1 Containers

Clean sample containers will be provided by the analytical laboratory ready for sample collection, including preservative, if required. Specific container requirements for samples that will undergo multiple analyses will be discussed with the analytical laboratory prior to sample collection.

2.6.2 Labeling Requirements

A sample label will be affixed to each container before sample collection. All containers will be marked with the project number, a sample number, date and time of collection, sampler's initials, and preservation type. Each sample will have a unique identification number that will be referenced by entry into notes. Soil samples will be labeled according to the boring number and the order the sample was collected (e.g., B1-S1).

2.6.3 Chain of Custody Procedures

Chain of custody forms will be used to document the collection, custody, and transfer of samples from their initial collection location to the laboratory. Each sample will be entered on the custody form immediately after it is collected.

Sample custody procedures will be followed to provide a record that can accompany a sample as it passes from collection through analysis. A sample is considered to be in custody if it meets at least one of the following conditions:

- it is in someone's physical possession or view;
- it is secured to prevent tampering (i.e., custody seals); and/or
- it is locked or secured in an area restricted to authorized personnel.

A chain of custody form will be completed in the field as samples are packaged. At a minimum, the information on the custody form will include the sample number, date and time of sample collection, sampler, analysis, and number of containers. A copy of the custody form will be placed in the cooler with its respective samples before the container is sealed for delivery to the laboratory. Another copy will be retained and placed in the project files after review by the project manager. Custody seals will be placed on each cooler containing samples so the package cannot be opened without breaking the seals.

After sample containers have been filled, they will be stored in a cooler cooled with ice or blue ice to approximately 4°C. The coolers will be transferred to the analytical laboratory for chemical analyses. Chain of custody procedures will be maintained and documented at all times, from commencement in the field until delivery of the samples to the analytical laboratory, as discussed previously. Specific procedures are:

- individual sample containers will be packed to prevent breakage;
- custody forms will be enclosed in a plastic bag and taped to the inside lid of the cooler;
- signed and dated custody seals will be placed on all coolers before shipping;
- samples will be hand-delivered to the analytical laboratory by Haley & Aldrich personnel or courier;

- when sample possession is transferred to the laboratory, the custody form will be signed by the persons transferring custody of the coolers; and
- upon receipt of samples at the laboratory, the shipping container custody seal will be broken, and the sample-receiving custodian will compare samples with information on the chain of custody form and record the condition of the samples received.

2.6.4 Laboratory Analyses and Turnaround Time

Soil, surface water, and groundwater samples will be analyzed by the selected environmental laboratory (accredited by Ecology) as outlined below.

2.6.4.1 Soil Samples

Analyze selected soil samples for TPH-G, TPH-DRO, VOCs, SVOCs, PCBs, and total metals (As, Cd, Cu, Cr, Pb, Hg, Ni, Zn). Up to 15 subsurface soil samples will be analyzed for VPH/EPH soil analyses.

All other soil samples will be analyzed on a standard turnaround time.

2.6.4.2 Groundwater Samples

Analyze selected groundwater samples for TPH-G, TPH-D, VOCs, SVOCs, as well as total and dissolved metals (same metals as soil plus potassium and sodium). Select grab groundwater samples will also be analyzed for TSS.

Groundwater samples will be analyzed on a standard turnaround time.

2.6.4.3 Surface Water Samples

Analyze selected surface water samples for TPH-G, TPH-D, VOCs, SVOCs, TSS, as well as total and dissolved metals.

Surface water samples will be analyzed on a standard turnaround time.

2.6.4.4 Product Material Sample

If collected, analyze the pipe product material for TPH-D Extended, TPH-G, metals, VOCs, SVOCs, and PCBs.

This sample will be analyzed on a standard turnaround time.

2.7 DECONTAMINATION PROCEDURES

2.7.1 Sampling Equipment Decontamination

To prevent cross contamination between sampling events, clean dedicated sampling equipment (e.g., disposable gloves, groundwater sampling tubing) will be used for each sample location and discarded after use. Cleaning of non-disposable items, such as the water level indicator, will consist of washing in a detergent (Liquinox®) solution, rinsing with tap water, followed with a deionized water rinse.

Decontamination water will be collected and handled as investigation-derived waste (IDW) as discussed in the following section.

The drilling subcontractor will use a specialized, self-contained decontamination trailer with a pressure washer and steam cleaner to clean the drilling equipment, such as drill rods and casing, prior to beginning each new boring. The IDW will be contained and transferred to drums stored on the site as discussed in the following section.

2.8 IDW MANAGEMENT

IDW will be generated during drilling activities, decontamination procedures, well development, and purging and sampling during quarterly groundwater monitoring events. The handling and disposal of specific types of IDW are discussed below. Copies of all disposal documentation (e.g., manifests, weight tickets) for IDW will be provided in the final report.

Soil and water IDW will be placed in separate, labeled, 55-gallon steel drums to be temporarily stored on the Property in a secure area on site. Associated samples collected from the RI activities will be used to profile the soil and water IDW for disposal. As a contingency, however, IDW samples will be collected from the drummed soil and only analyzed if requested by the receiving facility. Upon receipt of the chemical analyses, the IDW will be appropriately disposed of at a permitted disposal or treatment facility.

Disposable sampling equipment (e.g., sample tubing) and personal protective equipment (e.g., nitrile gloves) will be placed in plastic bags after use and disposed of as solid waste.

3. Quality Assurance and Quality Control

The laboratory reports will be reviewed by a Haley & Aldrich technical specialist to ensure conformance with project standards, provide additional data qualifications as appropriate, and verify that the data are acceptable for the purposes of the project. This includes reviewing holding times, reporting limits, method blanks, surrogate recoveries, laboratory duplicate relative percent differences (RPDs), spike blank/spike blank duplicate (SB/SBD) recoveries, and matrix spike/matrix spike duplicate (MS/MSD) recoveries.

3.1 DATA QUALITY INDICATORS

The overall quality assurance objectives for field sampling, field measurements, and laboratory analysis are to produce data of known and appropriate quality. The procedures and quality control checks specified herein will be used so that known and acceptable levels of accuracy and precision are maintained for each data set. This section defines the objectives for accuracy and precision for laboratory data. These goals are primarily expressed in terms of acceptance criteria for the quality control checks performed.

3.1.1 Precision

Precision is the degree of reproducibility or agreement between independent or repeated measurements. Analytical variability will be expressed as the RPD between laboratory replicates and

between MS and MSD analyses. RPD will be used to measure precision for this investigation and is defined as follows:

$$RPD = \frac{|D_1 - D_2|}{(D_1 + D_2)/2} \times 100$$

Where

D_1 = sample value
D_2 = duplicate sample value

3.1.2 Accuracy

Accuracy is the agreement between a measured value and its true or accepted value. While it is not possible to determine absolute accuracy for environmental samples, analysis of standards and spiked samples provides an indirect assessment of accuracy.

Laboratory accuracy will be assessed as the percent recovery of MSs, MSDs, surrogate spiked compounds (for organic analyses), and laboratory control samples. Accuracy will be defined as the percentage recovery compared with the true or accepted value and is defined as follows:

$$\%\ Recovery = \frac{(SSR - SR)}{SA} \times 100$$

Where

SSR = spiked sample result
SR = sample results (not applicable for surrogate recovery)
SA = amount of spike added

3.1.3 Representativeness

Representativeness expresses 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. The sampling program will be designed carefully to see that sample locations are selected properly, sufficient numbers of samples are collected to accurately reflect conditions at the Site, and samples are representative of sample locations. A sufficient sample volume will be collected at each sampling point to minimize bias or errors associated with sample particle size and heterogeneity.

3.1.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. So that results are comparable, samples will be analyzed using standard EPA methods and protocols as described in Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (EPA 1986). Data will also be reviewed to verify that precision and accuracy criteria have been achieved and, if not, that data have been appropriately qualified.

Field personnel will collect samples in a consistent manner at all sampling locations so that all data collected as part of this study are comparable. Comparability is attained by careful adherence to

standardized sampling and analytical procedures, based on rigorous documentation of sample locations (including depth, time, and date).

3.1.5 Completeness

Completeness is the percentage of measurements made that are judged to be valid. Completeness will be calculated separately for each analytical group (e.g., TPHs and VOCs). For results to be considered complete, all quality control check analyses required to verify precision and accuracy must have been performed. Data qualified as estimated during the validation process will be considered complete. Results that are rejected during the validation review or samples for which no analytical results were obtained will be considered non-valid measurements. Completeness will be calculated for each analysis using the following equation:

$$Completeness = \frac{valid\ data\ points\ obtained}{total\ data\ points\ planned} \times 100$$

The target goal for completeness is a minimum of 95 percent. Completeness will be monitored on an on-going basis so that archived sample extracts can be reanalyzed, if required, without remobilization.

3.2 DATA QUALITY ASSURANCE REVIEW

Haley & Aldrich will independently review the quality of the chemical analytical results provided by the laboratory. The data quality report will assess the adequacy of the reported detection limits in achieving the project screening levels; the precision and accuracy of the data; and the usability of the analytical data for project objectives. Exceedances of analytical control limits will be summarized and evaluated.

A data evaluation review will be performed on an all results using quality control summary sheet results provided by the laboratory for each report. Data evaluation reviews are based on the quality control requirements previously described and follow the format of the EPA National Functional Guidelines for Organic Superfund Methods Data Review (EPA 2020), modified to include specific criteria of individual analytical methods. The laboratory will be contacted to obtain raw data (instrument tuning, calibrations, instrument printouts, bench sheets, and laboratory worksheets) if any problems or discrepancies are discovered during the routine evaluation.

The data evaluation review will verify:

- That sample numbers and analyses match the chain of custody request;
- Sample preservation and holding times;
- That instrument tuning and performance criteria were achieved;
- That laboratory blanks were analyzed at the proper frequency and that no analytes were present in the blanks;
- That laboratory duplicates, MSs, surrogate compounds, and laboratory control samples control limits were met; and
- That required detection limits were achieved.
- Data qualifier flags, beyond any applied by the laboratory, will be added to sample results that fall outside the quality control acceptance criteria. Typical data qualifiers are:

- **U** The compound was analyzed for but was not detected above the reporting limit. The associated numerical value is the sample reporting limit.
- **J** The associated numerical value is an estimated quantity because quality control criteria were slightly exceeded and/or the associated numerical value is detected below Reporting Limit and above the method detection limit.
- **UJ** The compound was analyzed for, but not detected. The associated numerical value is an estimated reporting limit because quality control criteria were not met.
- **R** Data are not usable because of significant exceedance of quality control criteria. The analyte may or may not be present; resampling and/or reanalysis is necessary for verification.

4. Data Analysis and Reporting

4.1 LABORATORY REPORTS

The laboratory data reports will consist of summary data packages that will include:

- Case narrative identifying the laboratory analytical batch number, matrix and number of samples included, analyses performed, and analytical methods used, and description of any problems or exceedance of quality control criteria and corrective action taken. The laboratory manager or a designee must sign the narrative.
- Copy of chain of custody forms for all samples included in the analytical batch.
- Tabulated sample analytical results with units, data qualifiers, percent solids, sample weight or volume, dilution factor, laboratory batch and sample number, Haley & Aldrich sample number, and dates sampled, received, extracted, and analyzed all clearly specified.
- Summary of calibration results.
- Blank summary results indicating samples associated with each blank.
- MS/MSD result summaries with calculated percent recovery and relative percent differences.
- Laboratory control sample results, when applicable, with calculated percent recovery.
- Electronically formatted data deliverable (EDD) results in EQuIS and Ecology EIM format.

4.2 DATA EVALUATION, ANALYSIS, AND REPORTING

After the planned fieldwork, sample analysis, and data quality review, results will be compared with the appropriate screening levels. A draft RI report will be prepared summarizing the sampling procedures and laboratory testing results. The report will include a map with sampling locations, figures and cross sections with areas and elevations of contamination, tabulated analytical testing data compared with MTCA cleanup levels, sample depth, chemical data quality review, and laboratory analytical reports. The report will include statements on any limitations on the data use that are the result of adverse QC exceedances, as identified in Section 3.2, Data Quality Assurance Review. A public review draft RI Report will be completed after incorporating comments from Ecology.

References

ASTM, 2009. ASTM D2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). American Society for Testing Materials. ASTM International, West Conshohocken, PA.

Ecology, 1997. NWTPH-Gx and NWTPH-Dx Methods, in Analytical Methods for Petroleum Hydrocarbons, ECY 97-602. Washington State Department of Ecology. June 1997.

EPA, 1986. Test Methods for Evaluating Solid Waste; Physical/Chemical Methods, SW-846, 3rd Update. Environmental Protection Agency.

EPA, 1992. Specifications and Guidance for Contaminant-Free Sample Containers. Environmental Protection Agency. OSWER Directive 92.0-05A.

EPA, 2020. US EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. Environmental Protection Agency. EPA-540-R-20-005, November 2020.

American Water Works Association, 1989. Standard Methods for the Examination of Water and Wastewater. 17th Edition.

APPENDIX B
Health and Safety Plan

HALEY & ALDRICH, INC.
SITE-SPECIFIC SAFETY PLAN

FOR

Treoil Industries Biorefinery

4242 Aldergrove Road, Ferndale, Washington

Project/File No. 0204476

Gensuite EZ Scan®

BI - Developers

Prepared By: Zachary Stephens	**Date: 6/26/2023**
Approvals: The following signatures constitute approval of this Health & Safety Plan.	
Insert Field Safety Managers electronic signature.	
Field Safety Manager: Harmony Lee	**Date: 7/3/2023**
Insert Project Manager's electronic signature.	
Project Manager: Andrew Kaparos	**Date:** Click or tap to enter a date.
HASP Valid Through: 8/31/2024	

Table of Contents

Attachments

STOP WORK AUTHORITY

In accordance with Haley & Aldrich (Haley & Aldrich) Stop Work Authority Operating Procedure (OP1035), any individual has the right to refuse to perform work that he or she believes to be unsafe without fear of retaliation. He or she also has the authority, obligation, and responsibility to stop others from working in an unsafe manner.

STOP Work Authority is the stop work policy for all personnel and subcontractors on the Site. When work has been stopped due to an unsafe condition, Haley & Aldrich site management (e.g., Project Manager [PM], Site Health & Safety Officer [SHSO], etc.) and the Haley & Aldrich Senior Project Manager (SPM) will be notified immediately.

Reasons for issuing a stop work order include, but are not limited to:

- The belief/perception that injury to personnel or accident causing significant damage to property or equipment is imminent.
- An Haley & Aldrich subcontractor is in breach of site safety requirements and/or their own site HASP.
- Identifying a substandard condition (e.g., severe weather) or activity that creates an unacceptable safety risk as determined by a qualified person.

Work will not resume until the unsafe act has been stopped OR sufficient safety precautions have been taken to remove or mitigate the risk to an acceptable degree. Stop work orders will be documented as part of an on-site stop work log, on daily field reports to include the activity/activities stopped, the duration, person stopping work, person in-charge of stopped activity/activities, and the corrective action agreed to and/or taken. Once work has been stopped, only the Haley & Aldrich SPM or SHSO can give the order to resume work. Haley & Aldrich senior management is committed to support anyone who exercises his or her “Stop Work” authority.

ISSUANCE AND COMPLIANCE

This HASP has been prepared in accordance with Occupational Safety and Health Administration (OSHA) regulations (CFR 29, Parts 1904, 1910, and 1926) if such are applicable.

The specific requirements of this HASP include precautions for hazards that exist during this project and may be revised as new information is received or as site conditions change.

- This HASP must be signed by all Haley & Aldrich personnel involved in implementation of the SOW (Section 2 of this HASP).
- This HASP, or a current signed copy, must be retained at all times when Haley & Aldrich staff are present.
- Revisions to this HASP must be outlined within the contents of the HASP. If immediate or minor changes are necessary, the Field Safety Manager (FSM), Haley & Aldrich, SSO and/or Project Manager (PM) may use Attachment 1 (HASP Amendment Form), presented at the end of this HASP. Any revision to the HASP requires employees and subcontractors to be informed of the changes so that they understand the requirements of the change.
- Deviations from this HASP are permitted with approval from the Haley & Aldrich FSM, PM, or Senior Health & Safety Manager (SHSM). Unauthorized deviations may constitute a violation of Haley & Aldrich company procedures/policies and may result in disciplinary action.
- This HASP will be relied upon by Haley & Aldrich's subcontractors and visitors to the site. Haley & Aldrich's subcontractors must have their own HASP which will address hazards specific to their trade that is not included in this HASP. This HASP will be made available for review to Haley & Aldrich's subcontractors and other interested parties (e.g. Facility personnel and regulatory agencies) to ensure that Haley & Aldrich has properly informed our subcontractors and others of the potential hazards associated with the implementation of the SOW to the extent that Haley &Aldrich is aware.

This site-specific HASP provides only site-specific descriptions and work procedures. General safety and health compliance programs in support of this HASP (e.g., injury reporting, medical surveillance, personal protective equipment (PPE) selection, etc.) are described in detail in the Haley &Aldrich Corporate Health and Safety Program Manual and within Haley & Aldrich's Standard Operating Procedures Both the manual and SOPs can be located on the Haley & Aldrich's Company Intranet. When appropriate, users of this HASP should always refer to these resources and incorporate to the extent possible. The manual and SOPs are available to clients and regulators upon request.

EMERGENCY EVENT PROCEDURES

1 - ASSESS THE SCENE

- **STOP WORK**
- Review the situation and ascertain if it's safe to enter the area.
- Evacuate the site if the conditions are unsafe.

2 - EVALUATE THE EMERGENCY

- **Call 911, or designated emergency number, if required.**
- **Provide first aid for the victim if qualified and safe to do so.**
  - First aid will be addressed using the onsite first aid kit. *
    - If providing first aid, remember to use proper first aid universal precautions if blood or bodily fluids are present.
- **If exposure to hazardous substance is suspected, immediately vacate the contaminated area.**
  - Remove any contaminated clothing and/or equipment.
  - Wash any affected dermal/ocular area(s) with water for at least 15 minutes.
  - Seek immediate medical assistance if any exposure symptoms are present.

** Note: Haley & Aldrich employees are not required or expected to administer first aid / CPR to any Haley & Aldrich staff member, Contractor, or Civilian personnel at any time; it is Haley & Aldrich´s position that those who do are doing so on their own behalf and not as a function of their job.*

3 - SECURE THE AREA

- **Cordon off the incident area, if possible.**
  - Notify any security personnel, if required.
  - Escort all non-essential personnel out of the area, if able.

4 - REPORT ON-SITE ACCIDENTS / INCIDENTS TO PM / SSO

- **Notify the PM and SSO as soon as it is safe to do so.**
  - Assist PM and SSO in completing any additional tasks, as required.

5 - INVESTIGATE / REPORT THE INCIDENT

- **Record details of the incident for input to the Gensuite.**
  - Complete any additional forms as requested by the PM and SSO.

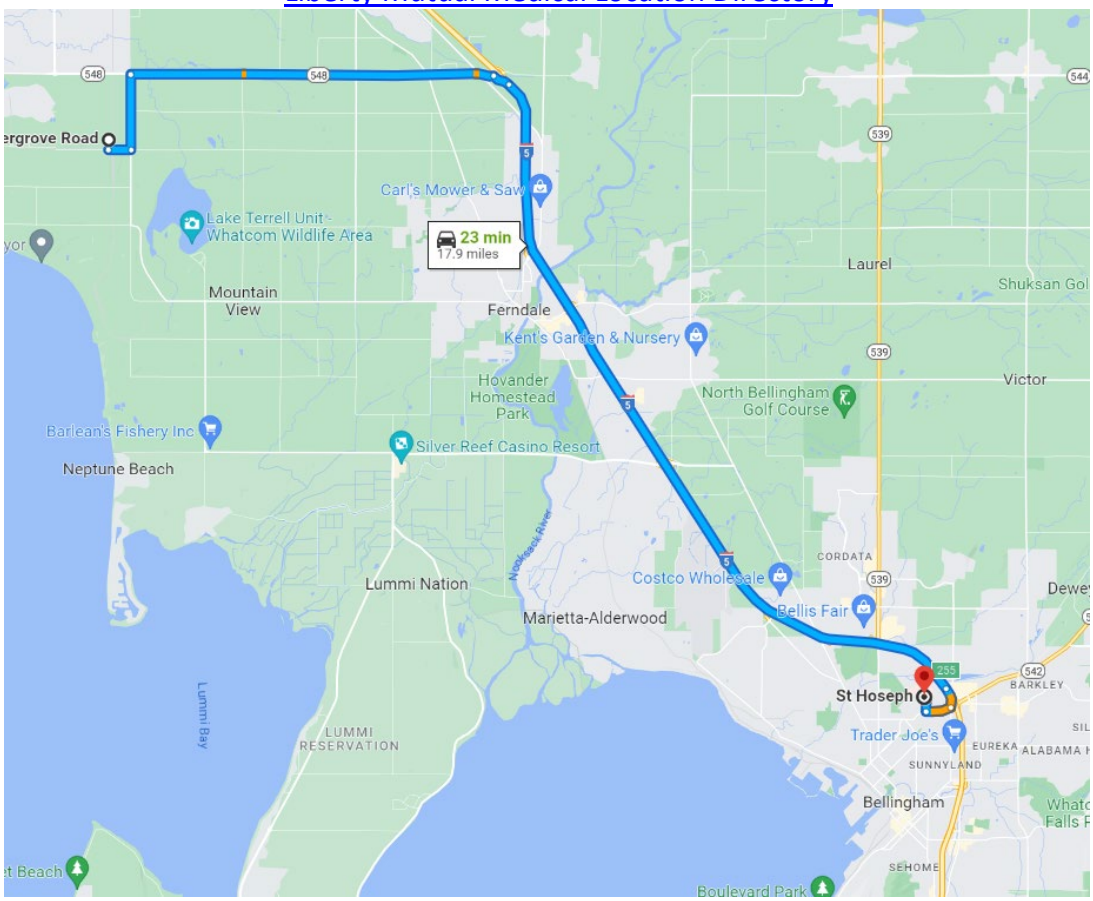
6 - TAKE CORRECTIVE ACTION

- **Implement corrective actions per the PM following root cause analysis.**
  - Complete Lessons Learned form.

PROJECT INFORMATION AND CONTACTS	
Project Name: Treoil Industries Biorefinery	**Haley & Aldrich File No.:** 0204476
Location: 4242 Aldergrove Road Ferndale, Washington	
Client/Site Contact: Phone Number:	Washington State Department of Ecology, Sunny Becker TBD
Haley & Aldrich Field Representative: Phone Number: Emergency Phone Number:	Sam Fisher 585.321.4224 206.635.8987
Haley & Aldrich Project Manager: Phone Number: Emergency Phone Number:	Andrew Kaparos 206.826.4485 206.473.7286
Field Safety Manager: Phone Number: Emergency Phone Number:	Sam Fisher 585.321.4224 206.635.8987
Subcontractor Project Manager: Phone Number:	TBD TBD
Nearest Hospital: Address: (see map on next page) Phone Number:	Saint Joseph 2927 Squalicum Pkwy, Bellingham, WA 98225 360.734.5400
Nearest Occ. Health Clinic: http://www.talispoint.com/liberty/ext/ Address: (see map on next page) Phone Number:	Birch Bay Family Medicine 8097 Harborview Rd, Blaine, WA 360.371.5855
Liberty Mutual Claim Policy	**WC6Z11254100033**
Emergency Response Number:	**911**
Other Local Emergency Response Number:	N/A
Other Ambulance, Fire, Police, or Environmental Emergency Resources:	

DIRECTIONS TO THE NEAREST HOSPITAL

Liberty Mutual Medical Location Directory



Directions to the Nearest Hospital:

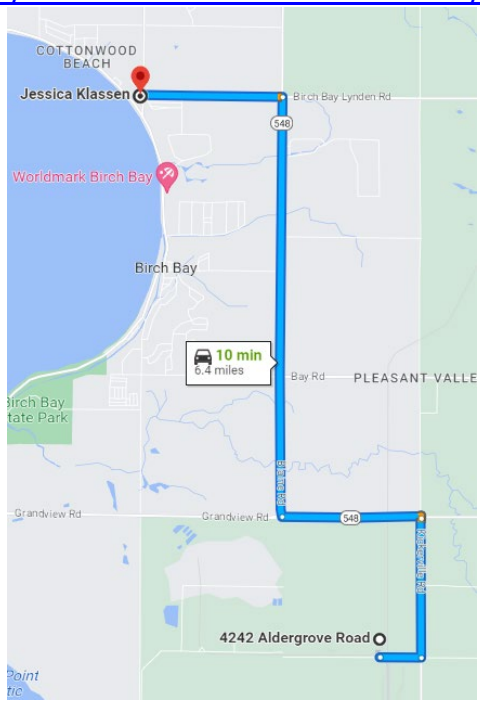
4242 Aldergrove Rd
Ferndale, WA 98248

- Get on I-5 S from WA-548
  10 min (6.4 mi)
- Follow I-5 S to E Sunset Dr in Bellingham. Take exit 255 from I-5 S
  10 min (11.0 mi)
- Continue on E Sunset Dr. Drive to Squalicum Pkwy
  2 min (0.5 mi)

St Hoseph
2979 Squalicum Pkwy, Bellingham, WA 98225

DIRECTIONS TO THE NEAREST URGENT CARE

[Liberty Mutual Medical Location Directory]



Directions to the Nearest Occupational Clinic:

4242 Aldergrove Rd
Ferndale, WA 98248

- Head east on Aldergrove Rd toward Kickerville Rd
  0.3 mi
- Turn left at the 1st cross street onto Kickerville Rd
  1.0 mi
- At the traffic circle, take the 3rd exit onto WA-548 N/Grandview Rd
  1.0 mi
- Turn right onto Blaine Rd
  3.0 mi
- Turn left onto Birch Bay Lynden Rd
  1.0 mi
- Slight right onto Morgan Dr
  Destination will be on the left
  72 ft

Jessica Klassen
8097 Harborview Rd, Blaine, WA 982309639

1. WORK SCOPE

This Site-Specific Health and Safety Plan addresses the health and safety practices and procedures that will be exercised by all Haley & Aldrich employees participating in all work on the Project Site. This plan is based on an assessment of the site-specific health and safety risks available to Haley & Aldrich and Haley & Aldrich's experience with other similar project sites. The scope of work includes the following:

Subsurface soil and groundwater investigations, groundwater monitoring well installation and sampling.

Project Task Breakdown

Task No.	Task Description	Employee(s) Assigned	Work Date(s) or Duration
1	Subsurface soil borings	Zach Stephens	August 2023, 1 week
2	Surface soil and water grab sampling	Sam Fisher	August 2023, 2 days
3	Groundwater monitoring well installation	Zach Stephens	August 2023, 1 week
4	Quarterly groundwater sampling	TBD	TBD

Subcontractor(s) Tasks

Firm Name	Work Activity	Work Date(s) or Duration
Holocene Drilling, Inc.	Drilling and installation of monitoring wells	August 2023, 1 week

Projected Start Date: 8/6/2023

Projected Completion Date: 8/12/2023

2. SITE OVERVIEW / DESCRIPTION

Site Classification

The project site can be classified as formerly industrial. Located on the project site is the remaining structures of the former Treoil Industries Biorefinery, which used to process tall oil and refine biodiesel. The site has been the focus of several environmental compliance concerns dating back to the late 1980s.

Site Description

Project work is expected to be focused around a ~3.5 acre area where former industrial processes were focused. The site consists of several structures, refinery towers, and tanks. Ground is mixed terrain with some paving, some exposed dirt, and some asphalt.

Background and Historic Site Usage

As previously stated, the site was previously the location for Treoil Industries Biorefinery, and has multiple known environmental concerns. Previous investigations have been conducted at the site, with suspects contaminants including petroleum products, VOCs including benzene, toluene, ethylbenzene, xylenes, along with PAHs, SVOCs, and heavy metals. Suspected contaminants are likely present to some extent in both soil, groundwater, and surface water spread out across the entirety of the site.

Site Status

Indicate current activity status and describe operations at the site:

Inactive

There are no current activities taking place on the site, but buildings formerly used while the site was active remain, and may still contain materials and or items from former activities.

Site Plan

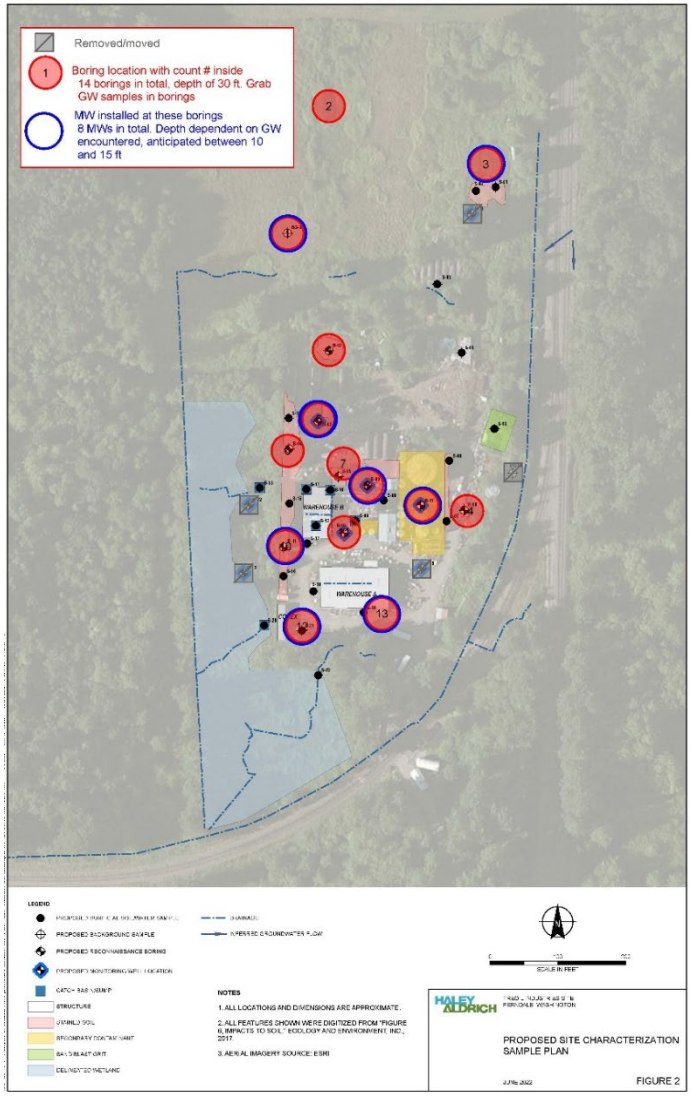
Is a site plan or sketch available? Yes

Work Areas

List and identify each specific work areas(s) on the job site and indicate its location(s) on the site plan:

Spread out throughout the entirety of the site.

Site Plan



See full site plan in the project folder:
\\haleyaldrich.com\share\sea_projects\Notebooks\0204476-000_Treoil_Industries_Site\GIS\Output

3. HAZARD ASSESSMENT

Indicate all hazards that may be present at the site and for each task. If any of these potential hazards are checked, it is the Project Manager's responsibility to determine how to eliminate / minimize the hazard to protect onsite personnel.

Site Chemical Hazards

Is this Site impacted with chemical contamination? Yes

Source of information about contaminants: Previous Investigation

Contaminant of Concern	Location/Media	Concentration	Units
BTEX/VOCs	**Soil Surficial, groundwater**	**0-15,000**	**ug/kg**
Polycyclic aromatic hydrocarbons (PAHs)	**Soil Surficial, groundwater**	**0-3,700**	**ug/kg**
Heavy Metals	**Soil**	**0 – 25,000**	**mg/kg**
Polychlorinated biphenyls (PCBs)	**Soil**	**0.2* (*identified in one location, suspected in others*)**	**mg/kg**
Choose an item.	Select Media.		Select Units
Choose an item.	Select Media.		Select Units
Choose an item.	Select Media.		Select Units
Choose an item.	Select Media.		
Choose an item.	Select Media.		Select Units
Choose an item.	Select Media.		Select Units

Total Petroleum Hydrocarbons (TPH): is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. Because there are so many different chemicals in crude oil and petroleum products, it is not practical to measure each one separately. However, it is useful to measure the total amount of TPH at a site.

TPH is a mixture of chemicals, but they are all made mainly from hydrogen and carbon, called hydrocarbons. Scientists divide TPH into groups of petroleum hydrocarbons that act alike in soil or water. These groups are called petroleum hydrocarbon fractions. Each fraction contains many individual chemicals.

Polycyclic aromatic hydrocarbons (PAHs): are a class of chemicals that occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. PAHs generated from these sources can bind to or form small particles in the air. High-temperature cooking will form PAHs in meat and in other foods. Naphthalene is a PAH that is produced commercially in the United States to make other chemicals and mothballs. Cigarette smoke contains many PAHs.

Polychlorinated biphenyls (PCBs): are a group of manufactured organic chemicals that contain 209 individual chlorinated chemicals. PCBs are either oily liquids or solids and are colorless to light yellow in color. They have no known smell or taste. There are no known natural sources of PCBs. Some commercial PCB mixtures are known in the United States by their industrial trade name e.g. Aroclor.

Site Hazards Checklist			
Weather			
Hot Temperatures	Select Hazard	Select Hazard	Select Hazard

Hot Temperatures

Heat stress may occur at any time work is being performed at elevated ambient temperatures. Because heat stress is one of the most common and potentially serious illnesses associated with outdoor work during hot seasons, regular monitoring and other preventative measures are vital. Site workers must learn to recognize and treat the various forms of heat stress. The best approach is preventative heat stress management.

H&A employees and their subcontractors should be aware of potential health effects and/or physical hazards of working when there are hot temperatures or a high heat index. Refer OP1015-Heat Stress for a discussion on hot weather hazards.

Biological			
Small Mammals	Mosquitoes	Stinging Insects	Ticks

Small Mammals

Rodents, are the most abundant order of mammals. There are hundreds of species of rats; the most common are the black and brown rat. Other rodents you may encounter are mice, beavers, squirrels, guinea pigs, capybaras and coypu.

The Brown Rat has small ears, blunt nose, and short hair. It is approximately 14-18” long (with tail). They frequently infest garbage/rubbish, slaughterhouses, domestic dwellings, warehouses, and supermarkets. They also frequent any space with an easy meal and potential nesting sites. The Black Rat is identified by its tail, that is always longer than the length from the head to the body. It is also slimmer and more agile than the Brown rat. Its size varies according to its environment and food supply.

The House Mouse has the amazing ability to adapt and can frequently be found in human dwellings. In

buildings, mice will live anywhere and difficult to keep out. Mice are omnivorous, they will eat anything. Rats and mice often become a serious problem in cold winter months when they seek food and warmth inside buildings. They may suddenly appear in large numbers when excavation work disturbs their in-ground nesting locations or their food source is changed.

Some major problems caused by rats and mice are contaminating the food they eat with urine and excrement. Gnawing into materials such as paper, wood, or upholstery, to use as nest material. Also gnawing plastic, cement, soft metals such as lead and aluminum, and wiring, which may cause a fire hazard. Occasionally biting people and may kill small animals. They, or the parasites they carry, like fleas, mites and worms, spread many diseases such as salmonella, trichinosis, rat bite fever, hantavirus, Weil's disease, and bubonic plague. They damage ornamental plants by burrowing among the roots or feeding on new growth. They also eat garden vegetables, such as corn and squash. These rodents have been a problem for centuries, because of their incredible ability to survive and are so difficult to eliminate. In addition, they are extremely compatible with human behavior and needs.

Avoid contact with rodents, if possible. Avoid contact with rodent excrement. Do not eat food or water that may have encountered rodent excrement. If exposed, wash hands and avoid touching your face with your hands.

Mosquitos

Work outdoors with temperatures above freezing will likely bring staff into contact with mosquitos. There are a variety of mosquito species that can transmit a range of diseases. Birds act as reservoirs for the viruses that can be collected by the mosquito and transmitted to a person. Majority of mosquitos are mainly a nuisance but staff need to take appropriate precautions to minimize the potential transmission of a virus that can result in one of the following diseases: West Nile, Eastern Equine Encephalitides and Western Encephalitides. Knowing some key steps that can minimize the risk of mosquito bites is, therefore, important in reducing the risks. Workers working outdoors should be aware that the use of PPE techniques is essential to preventing mosquito bites especially when working at sites where mosquitoes may be active and biting.

Use repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-diol products provide longer-lasting protection. To optimize safety and effectiveness, repellents should be used according to the label instructions. Cover as much of your skin as possible by wearing shirts with long-sleeves, long pants, and socks whenever possible. Avoid use of perfumes and colognes when working outdoors during peak times when mosquitoes may be active; mosquitoes may be more attracted to individuals wearing perfumes and colognes.

Stinging Insects

Stinging Insects fall into two major groups: Apidae (honeybees and bumblebees) and vespids (wasps, yellow jackets, and hornets). Apidae are docile and usually do not sting unless provoked. The stinger of the honeybee has multiple barbs, which usually detach after a sting. Vespids have few barbs and can inflict multiple stings.

There are several kinds of stinging insects that might be encountered on the project site. Most stings will only result in a temporary injury. However, sometimes the effects can be more severe, even life-

threatening depending on where you are stung and what allergies you have. Being stung in the throat area of the neck may cause edema (swelling caused by fluid build-up in the tissues) around the throat and may make breathing difficult.

In rare cases, a severe allergic reaction can occur. This can cause "anaphylaxis" or anaphylactic shock with symptoms appearing immediately or up to 30 minutes later. Symptoms include; Hives, itching and swelling in areas other than the sting site, swollen eyes/eyelids, wheezing, chest tightness, difficulty breathing, hoarse voice, swelling of the tongue, dizziness or sharp drop in blood pressure, shock, unconsciousness or cardiac arrest. Reactions can occur the first time you are stung or with subsequent stings. If you see any signs of reaction, or are unsure, call or have a co-worker call emergency medical services (e.g., 911) right away. Get medical help for stings near the eyes, nose or throat. Stay with the person who has been stung to monitor their reaction.

Staff who are allergic to bee stings are encouraged to inform their staff/project manager. If staff member carries an Epi-pen (i.e., epinephrine autoinjector) they are encouraged to inform their colleagues in case they are stung and are incapable of administering the injection. Examine site for any signs of activity or a hive/nest. If you see several insects flying around, see if they are entering/exiting from the same place. Most will not sting unless startled or attacked. Do not swat, let insects fly away on their own. If you must, walk away slowly or gently "blow" them away. If a nest is disturbed and you hear "wild" buzzing, protect your face with your hands and run from the area immediately. Wear long sleeves, long pants, and closed-toed boots. Wear light colored clothes such as khakis. Avoid brightly colored, patterned, or black clothing. Tie back long hair to avoid bees or wasps from entanglement. Do not wear perfumes, colognes or scented soaps as they contain fragrances that are attractive. If bee or wasp is found in your car, stop and leave windows open.

Ticks

Ticks are generally found in wooded, brushy, or grassy areas. They favor moist, shaded areas with fallen leaves and low vegetation, often sitting on the tips of tall grass or on shrubs waiting for a host to pass. Adult ticks are approximately the size of sesame seeds and are most active from March to mid-May and mid-August to November. Both nymphs and adults can transmit Lyme disease. Ticks can be active any time the temperature is above freezing. Ticks burrow into the host's skin to position themselves to withdraw blood. Infected ticks pass pathogens to the host through the bloodstream. Once imbedded, they may remain on the host for days. On humans, they frequently crawl to fleshy parts of the body and into difficult to reach spots such as the groin, armpit, or scalp.

A fine-tipped tweezer is recommended for tick removal tool and should be in the first-aid kit. Follow these steps: Pull upward with steady, even pressure. Do not twist or jerk the tick; this can cause mouth parts to break off and remain in the skin. If this happens, remove the parts with tweezers. If unable to remove easily with tweezers, leave them alone and let the skin heal.

After removing the tick, thoroughly clean the bite area and hands with rubbing alcohol, iodine scrub, or soap & water. Dispose of live ticks by submersal in alcohol, placing it in a sealed bag/container, wrap it tightly in tape or flush it down the toilet. Never crush ticks with your fingers. Do not attempt to use nail polish remover, petroleum jelly, lotion or heat to try to get the tick to exit skin. Swift removal is key.

Wear light-colored clothing so ticks stand out and long-sleeved shirts and long pants to reduce skin exposure. Tuck your shirt into your pants and tuck your pants into your socks to close gaps. Use repellent containing 20-30% DEET (N, N-diethyl-m-toluamide) on exposed skin and clothing. Avoid hands, eyes and mouth and wash off repellent when back indoors. Treat clothing with or purchase clothing with products containing 0.5% permethrin. It remains protective through several washings. Conduct frequent tick checks on clothing and skin. Have others check your back, scalp, and behind your ears and check gear for "hitchhikers". As soon as returning indoors, take a bath or shower and do a full-body inspection using a mirror. Wash field clothes and tumble dry on high to kill any ticks that may be hidden. If working in an area of significant tick habitat PPE may need to be upgraded to a Tyvek suit. Implementation of controls is crucial to minimize or eliminate the possibility of a tick bite. Should a staff member find an embedded tick they need to report it immediately to Corporate H&S. If a staff member has been bitten contact Corporate H&S and Work Care at 888-449-7787 to initiate the Tick Management Protocol. Once bitten, it takes approximately 48 hours to transmit Lyme Disease.

Location/Terrain			
Slip/Trip/Falls	Choose an item.	Choose an item.	Choose an item.

Slips, Trips & Falls

Slip and trip injuries are the most frequent injuries to workers. Statistics show most falls happen on the same level resulting from slips and trips. Both slips and trips result from unintended or unexpected change in the contact between the feet and the ground or walking surface. Good housekeeping, quality of walking surfaces (flooring), awareness of surroundings, selection of proper footwear, and appropriate pace of walking are critical for preventing fall accidents.

Site workers will be walking on a variety of irregular surfaces, that may affect their balance. Extra care must be taken to walk cautiously near rivers because the bottom of the riverbed maybe slick and may not be visible. Rocks, gradient changes, sandy bottoms, and debris may be present but not observable.

Take your time and pay attention to where you are going. Adjust your stride to a pace that is suitable for the walking surface and the tasks you are doing. Check the work area to identify hazards - beware of trip hazards such as wet floors, slippery floors, and uneven surfaces or terrain. Establish and utilize a pathway free of slip and trip hazards. Choose a safer walking route. Carry loads you can see over. Keep work areas clean and free of clutter. Communicate hazards to on-site personnel and remove hazards as appropriate.

Miscellaneous			
Other	Choose an item.	Choose an item.	Choose an item.

Evidence of vagrants utilizing site was identified in Warehouse B during site reconnaissance and confirmed by the Ecology site contact. Furthermore, evidence of drug paraphernalia was also visible in the vicinity adjacent to where it appeared a vagrant was living at some point. Though the Ecology site contact said the known individual has since moved on from the site, it is recommended that all site visits are conducted in teams of at least 2 people and to minimize separation from each other as much as possible when conducting project work.

Task Hazard Summary

Task 1 - Underground Utility Clearance

Ground disturbance activities such as excavating or drilling have the potential to contact underground utilities and may be considered a hazardous activity and a permit to work may be required. Once the H&A Project Manager has identified the work zone and the areas designated for ground disturbance the PM or designee is required to delineate the area with either white paint or flags so that the appropriate agencies know which area to check for their respective utilities. Haley & Aldrich staff members must ensure that permission has been gained from the property owner to access the property prior to site entry and before marking any proposed exploration or drilling locations.

The Project Manager shall verify that the proposed dig or drill zones are adequately marked or staked prior to the locators site visit, and that the appropriate Line Location Organization/ Contractor has been notified (a minimum of 72 business hours in advance) of all planned ground disturbance activities and a request for line location has been registered with the applicable One Call or dial Before You Dig organization when applicable. Personnel that are required to mark the area need to identify and understand the hazards associated with the project area which can range from a public roadway to a greenspace in a remote location.

See OP1020 Work Near Utilities.

Task 2– Drilling

Drilling is conducted for a range of services that can include but are not limited to: soil characterization, environmental investigation, well installation, and ore exploration. Familiarity with basic drilling safety is an essential component of all drilling projects. Potential hazards related to drilling operations include, but are not limited to encountering underground or overhead utilities, traffic and heavy equipment, hoisting heavy tools, steel impacts, open rotation entanglement, and the planned or unexpected encountering of toxic or hazardous substances. While staff members do not operate drilling equipment, they may work in close proximity to operating drilling equipment and may be exposed to many of the same hazards as the drilling subcontractor. It is imperative that staff are aware of emergency stops and establish communication protocols with the drillers prior to the start of work.

See OP 1002 Drilling Safety for more information.

Task 3 – Water Sampling

Environmental water sampling could include activities such as groundwater sampling from permanent or temporary wells, or surface water sampling from streams, rivers, lakes, ponds, lagoons, and surface impoundments.

Sampling tasks could involve uncapping, purging (pumping water out of the well), and sampling, and/or monitoring, new or existing monitoring wells. A mechanical pump may be used to purge the wells and can be hand-, gas-, or electric-operated. Water samples taken from the wells are then placed in containers and shipped to an analytical laboratory for analysis. The physical hazards of these operations are primarily associated with the collection methods and procedures used.

When sampling bodies of water containing known or suspected hazardous substances, adequate precautions must be taken to ensure the safety of sampling personnel. The sampling team member collecting the sample should not get too close to the edge, where ground failure or slips, trips or falls may cause him/her to lose his/her balance. The person performing the sampling should have fall restraint or protection for the task. When conducting sampling from a boat in an impoundment or flowing waters, appropriate vessel safety procedures should be followed. Avoid lifting heavy coolers with back muscles; instead, use ergonomic lifting techniques, team lift or mechanical lifts. Wear proper gloves, such as when handling sample containers to avoid contacting any materials that may have spilled out of the sample containers.

Inhalation and absorption of COCs are the primary routes of entry associated with water sampling, due to the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. During this project, several different groundwater sampling methodologies may be used based on equipment accessibility and the types of materials to be sampled. These sampling methods may include hand or mechanical bailing. The primary hazards associated with these specific sampling procedures are not potentially serious; however, other operations in the area or the conditions under which samples must be collected may present chemical and physical hazards. The hazards directly associated with groundwater sampling procedures are generally limited to strains or sprains from hand bailing, and potential eye hazards. Exposure to water containing COCs is also possible. All tools and equipment that will be used at the site must be intrinsically safe (electronics and electrical equipment) and non-sparking or explosion-proof (hand tools).

Task Physical Hazards Checklist				
Potential Task Hazards	**Task 1** **Subsurface soil borings**	**Task 2** **Surface soil and water grab sampling**	**Task 3** **Groundwater monitoring well installation**	**Task 4** **Quarterly groundwater sampling**
Generated Wastes	☒	☐	☒	☒
Rotating Equipment	☒	☐	☒	☐
Ground Disturbance	☒	☐	☒	☐
Underground Utilities	☒	☐	☒	☐

Noise	☒	☐	☒	☐
Energized Equipment	☒	☐	☒	☐
Hand/Power Tools	☐	☒	☐	☒
Heavy Equipment	☒	☐	☐	☐
Repetitive Motion	☒	☒	☒	☒
Underground Utilities	☒	☐	☒	☐
Other: Specify	☐	☐	☐	☐

Summary of Physical Hazards & Controls

Ergonomics

Most Work-related Musculoskeletal Disorders (WMSDs) are caused by Ergonomic Stressors. Ergonomic Stressors are caused by poor workplace practices and/or insufficient design, which may present ergonomic risk factors. These stressors include, but not limited to, repetition, force, extreme postures, static postures, quick motions, contact pressure, vibration, and cold temperatures.

WMSDs are injuries to the musculoskeletal system, which involves bones, muscles, tendons, ligaments, and other tissues in the system. Symptoms may include numbness, tightness, tingling, swelling, pain, stiffness, fatigue, and/or redness. WMSD are usually caused by one or more Ergonomic Stressors. There may be individual differences in susceptibility and symptoms among employees performing similar tasks. Any symptoms are to be taken seriously and reported immediately.

See OP1053 Ergonomics for more information.

Controls

- Ensure workstations are ergonomically correct so bad posture is not required to complete tasks.
- Take periodic breaks over the course of the day.
- Stretch during break times.
- Break up tasks that require repetitive motion.
- Contact Corporate H&S with any ergonomic concerns

Generated Waste

Activities on environmental sites may generate waste that requires regulated handling and disposal. Excess sample solids, decontamination materials, poly sheeting, used PPE, etc. that are determined to be free of contamination through field or laboratory screening can usually be disposed into client-approved, on-site trash receptacles. Uncontaminated wash water may be discarded onto the ground surface away from surface water bodies in areas where infiltration can occur. Contaminated materials must be segregated into liquids or solids and drummed separately for off-site disposal.

Controls

- Manage waste properly through good work practices.

- Collect, store, containerize waste, and dispose of it properly.
- All wastes generated shall be containerized in an appropriate container (i.e. open or closed top 55-gallon drum, roll-off container, poly tote, cardboard box, etc.) as directed by the PM.
- Containers should be inspected for damages or defects
- Waste containers should be appropriately labeled indicating the contents, date the container was filled, owner of the material (including address) and any unique identification number, if necessary.
- Upon completion of filling the waste container, the container should be inspected for leaks and an appropriate seal.

Ground Disturbance

Ground disturbance is defined as any activity disturbing the ground. Ground disturbance activities include, but are not limited to, excavating, trenching, drilling (either mechanically or by hand), digging, plowing, grading, tunneling and pounding posts or stakes.

Because of the potential hazards associated with striking an underground utility or structure, the operating procedure for underground utility clearance shall be followed prior to performing any ground disturbance activities.

See OP1020 Working Near Utilities

Controls

Prior to performing ground disturbance activities, the following requirements should be applied:

- Confirm all approvals and agreements (as applicable) either verbal or written have been obtained.
- Request for line location has been registered with the applicable One-Call or Dial Before You Dig organization, when applicable.
    - Whenever possible, ground disturbance areas should be adequately marked or staked prior to the utility locators site visit.
- Notification to underground facility operator/owner(s) that may not be associated with any known public notification systems such as the One-Call Program regarding the intent to cause ground disturbance within the search zone.
- Notifications to landowners and/or tenant, where deemed reasonable and practicable.
- Proximity and Common Right of Way Agreements shall be checked if the line locator information is inconclusive.

Hand and Power Tools

Hand and power tools can expose staff to a wide range of hazards depending upon the tool used. Hazards can include but are not limited to: falling, flying, abrasive, and splashing objects, or harmful dusts, fumes, mists, vapors, or gases.

Serious accidents often occur before steps are taken to evaluate and avoid or eliminate tool-related hazards. Staff must recognize the hazards associated with the different types of tools and the safety precautions necessary to prevent those hazards.

See OP 1026 Hand and Power Tools for more information.

Controls

- Keep all tools in good condition with regular maintenance.
- Use the right tool for the job. Do not use a tool for a task which it was not designed for.
- Examine each tool for damage before use and do not use damaged tools.
- For tools that are damaged or defective, red tag the tool and take out of service.
- Operate tools per the manufacturers' instructions.
- Use the appropriate personal protective equipment.
- All electrically powered tools will be connected through a ground fault circuit interrupter (GFCI).
- All personnel must be trained on the use of the tool they are utilizing.

Heavy Equipment

Staff must be careful and alert when working around heavy equipment, failure or breakage and limited visibility can lead to accidents and worker injury. Heavy equipment such as cranes, drills, haul trucks, or other can fail during operation increasing chances of worker injury. Equipment of this nature shall be visually inspected and checked for proper working order prior to commencement of field work. Those operating heavy equipment must meet all requirements to operate the equipment. Haley & Aldrich, Inc. staff that supervise projects or are associated with high risk projects that involve digging or drilling should use due diligence when working with a construction firm.

See OP1052 Heavy Equipment for additional information.

Controls

- Only approach equipment once you have confirmed contact with the operator (e.g., operator places the bucket on the ground).
- Always maintain visual contact with operators and keep out of the strike zone whenever possible.
- Always be alert to the position of the equipment around you.
- Always approach heavy equipment with an awareness of the swing radius and traffic routes of all equipment and never go beneath a hoisted load.
- Avoid fumes created by heavy equipment exhaust.

Line of Fire

Line of fire refers to the path an object will travel. Examples of line of fire situations typically observed on project sites include lifting/hoisting, lines under tension, objects that can fall or roll, pressurized objects or lines, springs or stored energy, work overhead, vehicles and heavy equipment.

Controls

- Never walk under a suspended load.
- Be aware and stay clear of tensioned lines such as cable, chain and rope.
- Be cautious of torque stresses that drilling equipment and truck augers can generate. Equipment can rotate unexpectedly long after applied torque force has been stopped.
- Springs and other items can release tremendous energy if compressed and suddenly released
- Items under tension and pressure can release tremendous energy if it is suddenly released.
- Not all objects may be overhead; be especially mindful of top-heavy items and items being transported by forklift or flatbed.

- Secure objects that can roll such as tools, cylinders, and pipes.
- Stay clear of soil cuttings or soil stockpiles generated during drilling operations and excavations, be aware that chunks of soil, rocks, and debris can fall or roll.

Noise

Working around heavy equipment (drill rigs, excavators, etc.) often creates excessive noise. The effects of noise include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities. Noise monitoring data that indicates that working within 25 feet of operating heavy equipment result in exposure to hazardous levels of noise (levels greater than 85 dBA).

See OP 1031 Hearing Conservation for additional information.

Controls

- Personnel are required to use hearing protection (earplugs or earmuffs) within 25 feet of any operating piece of heavy equipment.
- Limit the amount of time spent at a noise source.
- Move to a quiet area to gain relief from hazardous noise sources.
- Increase the distance from the noise source to reduce exposure.

Repetitive Motion

Repetitive Motion or Strain Injuries are injuries effecting muscles, nerves, and tendons by repetitive movement and overuse. Almost any kind of awkward or repetitive motion you make could lead to an injury over time. Actions like bending or twisting of the wrists, reaching for materials, working with your hands above shoulder level, or grasping objects can increase wear and tear on the body. The condition mostly effects the upper body.

Controls

- Arrange your work zone, supplies and tools as much as possible to avoid reaching, leaning, bending and twisting your waist or wrists.
- During rest breaks, use stretches to loosen up your body.
- Vary tasks if you can so that you are not making the same movement repeatedly over for a long period.

Rotating Equipment

Exposure to rotating parts can occur when working near a drilling rig, or other similar equipment. All rotating parts should be covered with guards to prevent access by workers. When performing maintenance activities that require the rotating parts to be exposed, workers should not allow loose clothing, hands, or tools to approach the rotating parts. Energy isolation procedures must be followed, and guards must be replaced as soon as possible after completing the maintenance task.

Operation of drilling equipment also creates hazards associated with pinch points and rotating equipment. These are hazards where the body and extremities, especially the hands, can be caught in moving equipment and crushed.

Controls

- Evaluate work procedures to avoid placing the body and extremities in the path of rotating equipment and tools to avoid being struck by moving equipment, tools and machinery.
- Evaluate equipment and tool use to identify pinch points and develop procedures to avoid placing body parts in a position where they can be caught in moving equipment, tools and machinery.
- Follow energy isolation procedures if required
- Do not work near rotating equipment with long loose hair, loose clothing or jewelry.

Underground Utilities

Various forms of underground/overhead utility lines or conveyance pipes may be encountered during site activities. Prior to the start of intrusive operations, utility clearance is mandated, as well as obtaining authorization from all concerned public utility department offices. Should intrusive operations cause equipment to come into contact with utility lines, the SHSO, Project Manager, and Regional H&S Manager shall be notified immediately. Work will be suspended until the client and applicable utility agency is contacted and the appropriate actions for the situation can be addressed.

See OP1020 Work Near Utilities for complete information.

Controls

- Obtain as-built drawings for the areas being investigated from the property owner;
- Visually review each proposed soil boring locations with the property owner or knowledgeable site representative;
- Perform a geophysical survey to locate utilities;
- Hire a private line locating firm to determine location of utility lines that are present at the property;
- Identifying a no-drill or dig zone;
- Hand dig or use vacuum excavation in the proposed ground disturbance locations if insufficient data is unavailable to accurately determine the location of the utility lines.

4. PROTECTIVE MEASURES

The personal protective equipment and safety equipment (if listed) is specific to the associated task. The required PPE and equipment listed must be onsite during the task being performed. Work shall not commence unless the required PPE or Safety Equipment is present.

Required Safety & Personal Protective Equipment

Required Personal Protective Equipment (PPE)	**Task 1**	**Task 2**	**Task 3**	**Task 4**
	Subsurface soil borings	Surface soil and water grab sampling	Groundwater monitoring well installation	Quarterly groundwater sampling
Hard hat	☐	☒	☒	☒
Safety Glasses	☒	☒	☒	☒
Safety Toed Shoes	☒	☒	☒	☒
Class 2 Safety Vest	☒	☒	☒	☒
Hearing Protection	☒	☐	☒	☐
Nitrile Gloves	☒	☒	☒	☒
Cut proof Gloves	☐	☒	☒	☒
Level of protection required	D	D	D	D
Required Safety Equipment				
Fire Extinguisher	☐	☐	☒	☐
First Aid Kit	☒	☒	☒	☒
Eyewash Bottles	☒	☒	☒	☒
Choose an item.	☐	☐	☐	☐

5. TRAINING REQUIREMENTS

The table below lists the training requirements staff must have respective to their assigned tasks and that are required to access the Site.

Site Specific Training Requirements

All members on site should have completed their 40-hour HAZWOPER training.

Task Specific Training Requirements

Required Training Type	**Task 1**	**Task 2**	**Task 3**	**Task 4**
	Enter task description.	Enter task description.	Enter task description.	Enter task description.
Choose an item.	☐	☐	☐	☐

6. AIR MONITORING PLAN AND EQUIPMENT

Exposures to airborne substances shall be fully characterized throughout project operations to ensure that exposure controls are effectively selected and modified as needed.

Is air/exposure monitoring required at this work site for personal protection? No

Is perimeter monitoring required for community protection? No

Air monitoring plan not applicable No

Air Monitoring/Screening Equipment Requirements

Photo-Ionization Detector (PID) 10.6eV

The required equipment listed above must be on site. Work shall not commence unless the equipment is present and in working order.

Monitoring Plans

Parameter/ Contaminant	Equipment	Action Level	Response Activity
VOCs	PID 10.6 eV	< 10 ppm	Continue work and monitoring.
		>10 ppm for 5 minutes	Clear Instrument and Re-Monitor the Area. Implement PPE upgrades
		>10 ppm for >5 minutes	Evacuate the area and call the RHSM and/or PM for further guidance. Implement engineering controls.

Zone Location and Monitoring Interval
Breathing zone and edge of Exclusion Zone.

7. DECONTAMINATION & DISPOSAL METHODS

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment through or over, tracking, or splashing potential or known contaminated/impacted materials.)

Personal Hygiene Safeguards

The following minimum personal hygiene safeguards shall be adhered to:

1. No smoking or tobacco products in any project work areas.
2. No eating or drinking in the exclusion zone.
3. It is required that personnel present on site wash hands before eating, smoking, taking medication, chewing gum/tobacco, using the restroom, or applying cosmetics and before leaving the site for the day.

It is recommended that personnel present on site shower or bathe at home at the end of each day of working on the site.

Decontamination Supplies

All decontamination should be conducted at the project site in designated zones or as dictated by Client requirements. Decontamination should not be performed on Haley & Aldrich owned or leased premises.

☐ Acetone	☒ Distilled Water	☐ Polyethylene Sheeting
☒ Alconox Soap	☐ Drums	☐ Pressure/Steam Cleaner
☐ Brushes	☐ Hexane	☐ Tap Water
☐ Disposal Bags	☐ Methanol	☐ Wash tubs
☒ 5 Gallon Buckets	☒ Paper Towels	☐ Other: Specify

Location of Decontamination Station

Describe/Enter location of decontamination station or refer to a figure where it is shown.

Standard Personal Decontamination Procedures

Outer gloves and boots should be decontaminated periodically as necessary and at the end of the day. Brush off solids with a hard brush and clean with soap and water or other appropriate cleaner whenever possible. Remove inner gloves carefully by turning them inside out during removal. Wash hands and forearms frequently. It is good practice to wear work-designated clothing while on-site which can be removed as soon as possible. Non-disposable overalls and outer work clothing should be bagged onsite prior to laundering. If gross contamination is encountered on-site contact the Project Manager and Field Safety Manager to discuss proper decontamination procedures.

The steps required for decontamination will depend upon the degree and type of contamination but will generally follow the sequence below.

1. Remove and wipe clean hard hat
2. Rinse boots and gloves of gross contamination
3. Scrub boots and gloves clean
4. Rinse boots and gloves
5. Remove outer boots (if applicable)
6. Remove outer gloves (if applicable)
7. Remove Tyvek coverall (if applicable)
8. Remove respirator, wipe clean and store (if applicable)
9. Remove inner gloves (if outer gloves were used)

PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles.

Small Equipment Decontamination

Pretreatment of heavily contaminated equipment may be conducted as necessary:

1. Remove gross contamination using a brush or wiping with a paper towel
2. Soak in a solution of Alconox and water (if possible)
3. Wipe off excess contamination with a paper towel

Standard decontamination procedure:

4. Wash using a solution of Alconox and water
5. Rinse with potable water
6. Rinse with methanol (or equivalent)
7. Rinse with distilled/deionized water

Inspect the equipment for any remaining contamination and repeat as necessary.

Disposal Methods
Procedures for disposal of contaminated materials, decontamination waste, and single use personal protective equipment shall meet applicable client, locate, State, and Federal requirements.
Disposal of Single Use Personal Protective Equipment
PPE that is not grossly contaminated can be bagged and disposed in regular trash receptacles. PPE that is grossly contaminated must be bagged (sealed and field personnel should communicate with the Project Manager to determine proper disposal.
Select text from the drop down that applies to the project. Click + to add additional language from the drop down.

8. SITE CONTROL

The overall purpose of site control is to minimize potential contamination of workers, protect the public from the site's hazards, and prevent vandalism. Site control is especially important in emergency situations. The degree of site control necessary depends on site characteristics, site size, and the surrounding community. The following information identifies the elements used to control the activities and movements of people and equipment at the project site.

Communication

Internal
Haley & Aldrich site personnel will communicate with other Haley & Aldrich staff member and/or subcontractors or contractors with:

Face to Face Communication

External
H&S site personnel will use the following means to communicate with off-site personnel or emergency services.

Cellular Phones

Visitors

Project Site
Will visitors be required to check-in prior to accessing the project site?

The Site is currently gated. Ecology will coordinate gate opening. No check-in required.

Visitor Access
Authorized visitors that require access to the project site need to be provided with known information with respect to the site operations and hazards as applicable to the purpose of their site visit. Authorized visitors must have the required PPE and appropriate training to access the project site.

Site Safety Officer is responsible for facilitating authorized visitor access.

Zoning

Work Zone
The work zone will be clearly delineated to ensure that the general public or unauthorized worker access is prevented. The following will be used:

Cones

9. SITE SPECIFIC EMERGENCY RESPONSE PLAN

The Emergency Response Plan addresses potential emergencies at this site, procedures for responding to these emergencies, roles, responsibilities during emergency response, and training. This section also describes the provisions this project has made to coordinate its emergency response with other contractors onsite and with offsite emergency response organizations (as applicable).

During the development of this emergency response plan, local, state, and federal agency disaster, fire, and emergency response organizations were consulted (if required) to ensure that this plan is compatible and integrated with plans of those organizations. Documentation of the dates of these consultations are the names of individuals contacted is kept on file and available upon request.

The site has been evaluated for potential emergency occurrences, based on site hazards, and the major categories of emergencies that could occur during project work are:

- Fire(s)/Combustion
- Hazardous Material Event
- Medical Emergency
- Natural Disaster

A detailed list of emergency types and response actions are summarized in Table X below. Prior to the start of work, the SSO will update the table with any additional site-specific information regarding evacuations, muster points, or additional emergency procedures. The SSO will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of these routes and assembly areas.

Pre-Emergency Planning

Before the start of field activities, the Project Manager will ensure preparation has been made in anticipation of emergencies. Preparatory actions include the following:

Meeting with the subcontractor/and or client concerning the emergency procedures in the event a person is injured. Appropriate actions for specific scenarios will be reviewed. These scenarios will be discussed, and responses determined before the sampling event commences. A form of emergency communication (i.e.; Cell phone, Air horn, etc.) between the Project Manager and subcontractor and/or client will be agreed on before the work commences.

A training session (i.e., “safety meeting”) given by the Project Manager or their designee informing all field personnel of emergency procedures, locations of emergency equipment and their use, and proper evacuation procedures.

Ensuring field personnel are aware of the existence of the emergency response HASP and ensuring a copy of the HASP accompanies the field team(s).

Onsite Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate work rescue, contamination control and reduction or post-emergency cleanup. Emergency response equipment stocked

Table 9.1 Emergency Equipment and Emergency PPE			
Emergency Equipment	**Specific Type**	**Quantity Stocked**	**Location Stored**
First Aid Kit	ANSI	1	Field Vehicle
Emergency PPE	**Specific Type**	**Quantity Stocked**	**Location Stored**
Select	Enter text	Enter text	Enter text

EVACUATION ALARM
Verbal Communication (Site Personnel are adjacent in work zone)
EVACUATION ROUTES
Will be given a map after site specific training
EVACUATION MUSTER POINT(S)/ SHELTER AREA(S)
Will be given a locations after site specific training
EVACUTION RESPONSE DRILLS
The Site relies on outside emergency responders and a drill is not required.

Table 9-2 – Emergency Planning

Emergency Type	Notification	Response Action	Evacuation Plan/Route
Chemical Exposure	Report event to SSO immediately	Refer to Safety Data Sheet for required actions	Remove personnel from work zone
Fire - Small	Notify SSO and contact 911	Use fire extinguisher if safe and qualified to do so	Mobilize to *Muster Point*
Fire – Large/Explosion	Notify SSO and contact 911	Evacuate immediately	Mobilize to *Muster Point*
Hazardous Material – Spill/Release	Notify SSO; SSO will contact PM to determine if additional agency notification is	If practicable don PPE and use spill kit and applicable procedures to contain the release	See Evacuation Map for route, move at least 100 ft upwind of spill location
Medical – Bloodborne Pathogen	Notify SSO	If qualified dispose in container or call client or city to notify for further instruction.	None Anticipated
Medical – First Aid	Notify SSO	If qualified perform first aid duties	None Anticipated
Medical – Trauma	If life threatening or transport is required call 911, immediately	Wait at site entrance for ambulance	Noe Anticipated
Security Threat	Notify SSO who will call 911 as warranted	Keep all valuables out of site and work zones delineated.	None Anticipated
Weather – Earthquake/Tsunami's	STOP WORK and evacuate Site upon any earthquake	Turn off equipment and evacuate as soon as is safe to do so	Mobilize to *Shelter Location*
Weather – Lightning Storm	STOP WORK	Work may resume 30 minutes after the last observed lightning.	None Anticipated
Weather – Tornadoes/Hurricanes	Monitor weather conditions STOP WORK and evacuate the site	Evacuate to shelter location or shelter in place immediately	Mobilize to *Shelter Location*
MUSTER POINT Entry gate		*SHELTER LOCATION* Warehouse	
In case of site emergencies, site personnel shall be evacuated per this table and will not participate in emergency response activities. Site emergencies shall be reported to local, state, and federal governmental agencies as required.			

10. HASP ACKNOWLEDGEMENT FORM

All Haley & Aldrich employees onsite must sign this form prior to entering the site.

I hereby acknowledge receipt of, and briefing on, this HASP prior to the start of on-site work. I declare that I understand and agree to follow the provisions, processes, and procedures set forth herein at all times while working on this site.

Printed Name	Signature	Date

PLEASE SEE ELECTRONIC HASP FOR ATTACHMENTS

APPENDIX C
Inadvertent Discovery Plan

INADVERTENT DISCOVERY PLAN

PLAN AND PROCEDURES FOR THE DISCOVERY OF CULTURAL RESOURCES AND HUMAN SKELETAL REMAINS

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6000 or visit https://ecology.wa.gov/accessibility. People with impaired hearing may call Washington Relay Service at 711. People with a speech disability may call TTY at 877-833-6341.

Site Name(s): Treoil Industries

Project Lead/Organization: Andrew Kaparos/Haley & Aldrich, Inc.

Location: 4242 Aldergrove Road in Ferndale, WA 98248

County: Whatcom

If this Inadvertent Discovery Plan (IDP) is for multiple (batched) projects, ensure the location information covers all project areas.

1. INTRODUCTION

The IDP outlines procedures to perform in the event of a discovery of archaeological materials or human remains, in accordance with applicable state and federal laws. An IDP is required, as part of Agency Terms and Conditions for all grants and loans, for any project that creates disturbance above or below the ground. An IDP is not a substitute for a formal cultural resource review (Executive 21-02 or Section 106).

Once completed, **the IDP shall always be kept at the project site** during all project activities. All staff, contractors, and volunteers shall be familiar with its contents and know where to find it.

2. CULTURAL RESOURCE DISCOVERIES

A cultural resource discovery could be prehistoric or historic artifacts. Examples include (see images for further examples):

- An accumulation of shell, burned rocks, or other food related materials.
- Bones, intact or in small pieces.
- An area of charcoal or very dark stained soil with artifacts.
- Stone tools or waste flakes (for example, an arrowhead or stone chips).
- Modified or stripped trees, often cedar or aspen, or other modified natural features, such as rock drawings.
- Agricultural or logging materials that appear older than 50 years. These could include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, and many other items.
- Clusters of tin cans or bottles, or other debris that appear older than 50 years.
- Old munitions casings. ***Always assume these are live and never touch or move***.
- Buried railroad tracks, decking, foundations, or other industrial materials.

- Remnants of homesteading. These could include bricks, nails, household items, toys, food containers, and other items associated with homes or farming sites.

The above list does not cover every possible cultural resource. When in doubt, assume the material is a cultural resource.

3. ON-SITE RESPONSIBILITIES

If any employee, contractor, or subcontractor believes that they have uncovered cultural resources or human remains at any point in the project, take the following steps to ***Stop-Protect-Notify***. **If you suspect that the discovery includes human remains, also follow Sections 5 and 6.**

STEP A: Stop Work.

All work must stop immediately in the vicinity of the discovery.

STEP B: Protect the Discovery.

Leave the discovery and the surrounding area untouched and create a clear, identifiable, and wide boundary (30 feet or larger) with temporary fencing, flagging, stakes, or other clear markings. Provide protection and ensure integrity of the discovery until cleared by the Department of Archaeological and Historical Preservation (DAHP) or a licensed, professional archaeologist.

Do not permit vehicles, equipment, or unauthorized personnel to traverse the discovery site. Do not allow work to resume within the boundary until the requirements of this IDP are met.

STEP C: Notify Project Archaeologist (if applicable).

If the project has an archaeologist, notify that person. If there is a monitoring plan in place, the archaeologist will follow the outlined procedure.

STEP D: Notify Project and Washington Department of Ecology (Ecology) contacts.

Project Lead Contacts

Primary Contact		Alternate Contact	
Name:	Andrew Kaparos	Name:	Heather Good
Organization:	Haley & Aldrich, Inc.	Organization:	Haley & Aldrich
Phone:	206-473-7286	Phone:	360-927-1309
Email:	akaparos@haleyaldrich.com	Email:	hgood@haleyaldrich.com

Ecology Contacts (completed by Ecology Project Manager)

Ecology Project Manager
Name: Sunny Becker
Program: Toxic Cleanup
Phone: 425-457-3842
Email: hlin461@ecy.wa.gov

Alternate or Cultural Resource Contact
Name: Jon Klem
Program: Toxic Cleanup, NWRO
Phone: 206-556-5584
Email: jon.klem@ecy.wa.gov

STEP E: Ecology will notify DAHP.

Once notified, the Ecology Cultural Resource Contact or the Ecology Project Manager will contact DAHP to report and confirm the discovery. To avoid delay, the Project Lead/Organization will contact DAHP if they are not able to reach Ecology.

DAHP will provide the steps to assist with identification. DAHP, Ecology, and Tribal representatives may coordinate a site visit following any necessary safety protocols. DAHP may also inform the Project Lead/Organization and Ecology of additional steps to further protect the site.

Do not continue work until DAHP has issued an approval for work to proceed in the area of, or near, the discovery.

DAHP Contacts:

Name: Rob Whitlam, PhD
Title: State Archaeologist
Cell: 360-890-2615
Email: Rob.Whitlam@dahp.wa.gov
Main Office: 360-586-3065

Human Remains/Bones:

Name: Guy Tasa, PhD
Title: State Anthropologist
Cell: 360-790-1633 (24/7)
Email: Guy.Tasa@dahp.wa.gov

4. TRIBAL CONTACTS

In the event cultural resources are discovered, the following tribes will be contacted. See Section 10 for Additional Resources.

Tribe: Lummi
Name: Lena Tso
Title: Cultural Resources
Phone: 360-312-2257
Email: lenat@lummi-nsn.gov

Tribe: Nooksack
Name: Trevor Delgado
Phone: 360-592-5176 x 3234
Email: tdelgado@nooksack-nsn.gov

Tribe: Samish
Name: Jackie Ferry
Phone: 360-293-6404 x 126
Email: jferry@samishtribe.nsn.us

Tribe: Upper Skagit
Name: Scott Schuyler
Phone: 360-854-7009
Email: sschuyler@upperskagit.com

Tribe: Sauk-Suiattle
Name: Kevin Joseph
Title: Cultural Resources
Email: kJoseph@sauk-suiattle.com

Tribe: Swinomish
Name: Josephine Jefferson
Phone: 360-466-7352
Email: jjefferson@swinomish.nsn.us

Please provide contact information for additional tribes within your project area, if needed, in Section 11.

5. FURTHER CONTACTS (if applicable)

If the discovery is confirmed by DAHP as a cultural or archaeological resource, or as human remains, and there is a partnering federal or state agency, Ecology or the Project Lead/Organization will ensure the partnering agency is immediately notified.

Federal Agency:

Agency: EPA
Name: Jenna Manheimer
Title: On-Scene Coordinator, Region 10
Phone: 206.553.1189
Email: Manheimer.Jenna@epa.gov

6. SPECIAL PROCEDURES FOR THE DISCOVERY OF HUMAN SKELETAL REMAINS

Any human skeletal remains, regardless of antiquity or ethnic origin, will at all times be treated with dignity and respect. Follow the steps under ***Stop-Protect-Notify.*** For specific instructions on how to handle a human remains discovery, see: *RCW 68.50.645: Skeletal human remains—Duty to notify—Ground disturbing activities—Coroner determination—Definitions*.

Suggestion: If you are unsure whether the discovery is human bone or not, contact Guy Tasa with DAHP, for identification and next steps. Do not pick up the discovery.

Guy Tasa, PhD State Physical Anthropologist
Guy.Tasa@dahp.wa.gov
(360) 790-1633 (Cell/Office)

For discoveries that are confirmed or suspected human remains, follow these steps:

1. Notify law enforcement and the Medical Examiner/Coroner using the contacts below. **Do not call 911** unless it is the only number available to you.

   Enter contact information below (required):

- Local Medical Examiner or Coroner name and phone: Island County Coroner, Shantel Porter, 360-679-7358
- Local Law Enforcement main name and phone: Sheriff's Office, 360-321-5113, ext. 7310
- Local Non-Emergency phone number (911 if without a non-emergency number): Sheriff's Office, 360-321-5113, ext. 7310

2. The Medical Examiner/Coroner (with assistance of law enforcement personnel) will determine if the remains are human or if the discovery site constitutes a crime scene and will notify DAHP.
3. **DO NOT speak with the media, allow photography or disturbance of the remains, or release any information about the discovery on social media.**
4. If the remains are determined to be non-forensic, cover the remains with a tarp or other materials (not soil or rocks) for temporary protection and to shield them from being photographed by others or disturbed.

Further activities:

- Per RCW 27.44.055, RCW 68.50, and RCW 68.60, DAHP will have jurisdiction over non-forensic human remains. Ecology staff will participate in consultation. The Project Lead/Organization may also participate in consultation.
- Documentation of human skeletal remains and funerary objects will be agreed upon through the consultation process described in RCW 27.44.055, RCW 68.50, and RCW 68.60.
- When consultation and documentation activities are complete, work in the discovery area may resume as described in Section 8.

If the project occurs on federal lands (such as a national forest or park or a military reservation) the provisions of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) apply and the responsible federal agency will follow its provisions. Note that state highways that cross federal lands are on an easement and are not owned by the state.

If the project occurs on non-federal lands, the Project Lead/Organization will comply with applicable state and federal laws, and the above protocol.

7. DOCUMENTATION OF ARCHAEOLOGICAL MATERIALS

Archaeological resources discovered during construction are protected by state law RCW 27.53 and assumed eligible for inclusion in the National Register of Historic Places under Criterion D until a formal Determination of Eligibility is made.

The Project Lead/Organization must ensure that proper documentation and field assessments are made of all discovered cultural resources in cooperation with all parties: the federal agencies (if any), DAHP, Ecology, affected tribes, and the archaeologist.

An archaeologist will record all prehistoric and historic cultural material discovered during project construction on a standard DAHP archaeological site or isolate inventory

form. They will photograph site overviews, features, and artifacts and prepare stratigraphic profiles and soil/sediment descriptions for minimal subsurface exposures. They will document discovery locations on scaled site plans and site location maps.

Cultural features, horizons, and artifacts detected in buried sediments may require the archaeologist to conduct further evaluation using hand-dug test units. They will excavate units in a controlled fashion to expose features, collect samples from undisturbed contexts, or to interpret complex stratigraphy. They may also use a test unit or trench excavation to determine if an intact occupation surface is present. They will only use test units when necessary to gather information on the nature, extent, and integrity of subsurface cultural deposits to evaluate the site's significance. They will conduct excavations using standard archaeological techniques to precisely document the location of cultural deposits, artifacts, and features.

The archaeologist will record spatial information, depth of excavation levels, natural and cultural stratigraphy, presence or absence of cultural material, and depth to sterile soil, regolith, or bedrock for each unit on a standard form. They will complete test excavation unit level forms, which will include plan maps for each excavation level and artifact counts and material types, number, and vertical provenience (depth below surface and stratum association where applicable) for all recovered artifacts. They will draw a stratigraphic profile for at least one wall of each test excavation unit.

The archaeologist will screen sediments excavated for purposes of cultural resources investigation through 1/8-inch mesh, unless soil conditions warrant 1/4-inch mesh.

The archaeologist will analyze, catalogue, and temporarily curate all prehistoric and historic artifacts collected from the surface and from probes and excavation units. The ultimate disposition of cultural materials will be determined in consultation with the federal agencies (if any), DAHP, Ecology, and the affected tribe(s).

Within 90 days of concluding fieldwork, the archaeologist will provide a technical report describing any and all monitoring and resultant archaeological excavations to the Project Lead/Organization, who will forward the report to Ecology, the federal agencies (if any), DAHP, and the affected tribe(s) for review and comment.

If assessment activities expose human remains (burials, isolated teeth, or bones), the archaeologist and Project Lead/Organization will follow the process described in **Section 6**.

8. PROCEEDING WITH WORK

The Project Lead/Organization shall work with the archaeologist, DAHP, and affected tribe(s) to determine the appropriate discovery boundary and where work can continue.

Work may continue at the discovery location only after the process outlined in this plan is followed and the Project Lead/Organization, DAHP, any affected tribe(s), Ecology, and the federal agencies (if any) determine that compliance with state and federal laws is complete.

9. ORGANIZATION RESPONSIBILITY

The Project Lead/Organization is responsible for ensuring:

- This IDP has complete and accurate information.
- This IDP is immediately available to all field staff at the site and available by request to any party.
- This IDP is implemented to address any discovery at the site.
- That all field staff, contractors, and volunteers are instructed on how to implement this IDP.

10. ADDITIONAL RESOURCES

Informative Video

Ecology recommends that all project staff, contractors, and volunteers view this informative video explaining the value of IDP protocol and what to do in the event of a discovery. The target audience is anyone working on the project who could unexpectedly find cultural resources or human remains while excavating or digging. The video is also posted on DAHP's inadvertent discovery language website.

Ecology's IDP Video (https://www.youtube.com/watch?v=ioX-4cXfbDY)

Informational Resources

DAHP (https://dahp.wa.gov)

Washington State Archeology (DAHP 2003)
(https://dahp.wa.gov/sites/default/files/Field%20Guide%20to%20WA%20Arch_0.pdf)

Association of Washington Archaeologists (https://www.archaeologyinwashington.com)

Potentially Interested Tribes

Tribal Contacts: Interactive Map of Tribes by Area
(https://dahp.wa.gov/archaeology/tribal-consultation-information)

Tribal Contacts - WSDOT Tribal Contact Website
(https://wsdot.wa.gov/tribal/TribalContacts.htm)

11. ADDITIONAL INFORMATION

Please add any additional contact information or other information needed within this IDP.

None

Implement the IDP if you see…

Chipped stone artifacts.

Examples are:

- Glass-like material.
- Angular material.
- “Unusual” material or shape for the area.
- Regularity of flaking.
- Variability of size.

Stone artifacts from Oregon.

Stone artifacts from Washington.

Biface-knife, scraper, or pre-form found in NE Washington. Thought to be a well knapped object of great antiquity. Courtesy of Methow Salmon Rec. Foundation.

Implement the IDP if you see…

Ground stone artifacts.

Examples are:

- Unusual or unnatural shapes or unusual stone.
- Striations or scratching.
- Etching, perforations, or pecking.
- Regularity in modifications.
- Variability of size, function, or complexity.

Above: Fishing Weight - credit CRITFC Treaty Fishing Rights website.

Artifacts from unknown locations (left and right images).

Implement the IDP if you see…

Bone or shell artifacts, tools, or beads.

Examples are:

- Smooth or carved materials.
- Unusual shape.
- Pointed as if used as a tool.
- Wedge shaped like a “shoehorn”.
- Variability of size.
- Beads from shell (dentalium) or tusk.

Upper Left:*Bone Awls from Oregon.*

Upper Center: *Bone Wedge from California.*

Upper Right: *Plateau dentalium choker and bracelet, from Nez Perce National Historical Park, 19th century, made using Antalis pretiosa shells Credit: Nez Perce - Nez Perce National Historical Park, NEPE 8762, Public Domain.*

Above: *Tooth Pendants.*

Right: Bone Pendants. Both from Oregon and Washington.

Implement the IDP if you see…

Culturally modified trees, fiber, or wood artifacts.

Examples are:

- Trees with bark stripped or peeled, carvings, axe cuts, de-limbing, wood removal, and other human modifications.
- Fiber or wood artifacts in a wet environment.
- Variability of size, function, and complexity.

Left and Below: *Culturally modified tree and an old carving on an aspen (Courtesy of DAHP). These are examples of above ground cultural resources.*

Right, Top to Bottom: *Artifacts from Mud Bay, Olympia: Toy war club, two strand cedar rope, wet basketry*.

Implement the IDP if you see…

Strange, different, or interesting looking dirt, rocks, or shells.

Human activities leave traces in the ground that may or may not have artifacts associated with them. Examples are:

- "Unusual" accumulations of rock (especially fire-cracked rock).
- "Unusual" shaped accumulations of rock (such as a shape similar to a fire ring).
- Charcoal or charcoal-stained soils, burnt-looking soils, or soil that has a "layer cake" appearance.
- Accumulations of shell, bones, or artifacts. Shells may be crushed.
- Look for the "unusual" or out of place (for example, rock piles in areas with otherwise few rocks).

Shell Midden pocket in modern fill discovered in sewer trench.

Underground oven. Courtesy of DAHP.

Shell Midden with fire cracked rock.

Hearth excavated near Hamilton, WA.

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Agricultural or logging equipment. May include equipment, fencing, canals, spillways, chutes, derelict sawmills, tools, etc.
- Domestic items including square or wire nails, amethyst colored glass, or painted stoneware.

Left: Top to Bottom: *Willow pattern serving bowl and slip joint pocket knife discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

Right: *Collections of historic artifacts discovered during excavations in eastern Washington cities.*

Implement the IDP if you see…

Historic period artifacts (historic archaeology considered older than 50 years).

Examples are:

- Railway tokens, coins, and buttons.
- Spectacles, toys, clothing, and personal items.
- Items helping to understand a culture or identity.
- Food containers and dishware.

Main Image: *Dishes, bottles, work boot found at the North Shore Japanese bath house (ofuro) site, Courtesy Bob Muckle, Archaeologist, Capilano University, B.C. This is an example of an above ground resource.*

Right, from Top to Bottom: *Coins, token, spectacles and Montgomery Ward pitchfork toy discovered during Seattle Smith Cove shantytown (45-KI-1200) excavation.*

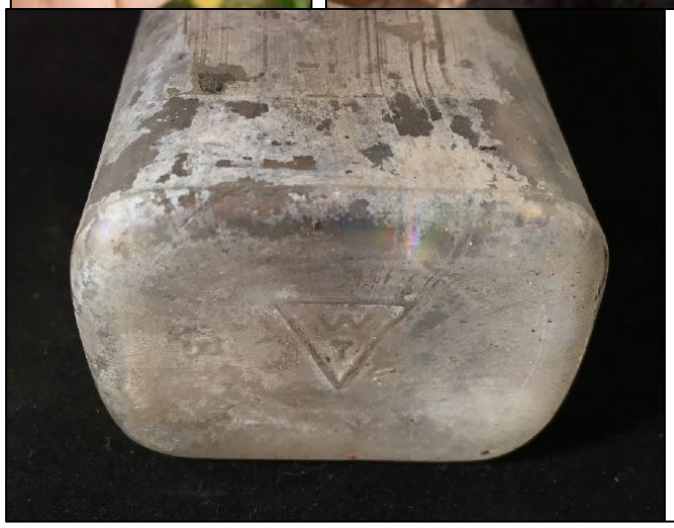
Implement the IDP if you see…

- Old munition casings – if you see ammunition of any type – ***always assume they are live and never touch or move!***
- Tin cans or glass bottles with an older manufacturer's technique – maker's mark, distinct colors such as turquoise, or an older method of opening the container.

Far Left: *.303 British cartridge found by a WCC planting crew on Skagit River.* ***Don't ever touch something like this!***

Left: *Maker's mark on bottom of old bottle.*

Right: *Old beer can found in Oregon. ACME was owned by Olympia Brewery. Courtesy of Heather Simmons.*



Logo employed by Whithall Tatum & Co. between 1924 to 1938 (Lockhart et al. 2016).

Can opening dates, courtesy of W.M. Schroeder.

Implement the IDP if you see…

Historic foundations or buried structures.

Examples are:

- Foundations.
- Railroad and trolley tracks.
- Remnants of structures.

Counter Clockwise, Left to Right: *Historic structure 45KI924, in WSDOT right of way for SR99 tunnel. Remnants of Smith Cove shantytown (45-KI-1200) discovered during Ecology CSO excavation, City of Spokane historic trolley tracks (above ground historic resources) uncovered during stormwater project, intact foundation of historic home that survived the Great Ellensburg Fire of July 4, 1889, uncovered beneath parking lot in Ellensburg.*

Implement the IDP if you see…

Potential human remains.

Examples are:

- Grave headstones that appear to be older than 50 years.
- Bones or bone tools--intact or in small pieces. It can be difficult to differentiate animal from human so they must be identified by an expert.
- These are all examples of animal bones and are not human.

Center: *Bone wedge tool, courtesy of Smith Cove Shantytown excavation (45KI1200).*

Other images (Top Right, Bottom Left, and Bottom) Center: Courtesy of DAHP.

Directly Above: *This is a real discovery at an Ecology sewer project site.*

What would you do if you found these items at a site? Who would be the first person you would call?

Hint: *Read the plan!*

APPENDIX D
Access Agreement

STATE OF WASHINGTON
WHATCOM COUNTY SUPERIOR COURT

STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY Plaintiff, v. CAMPBELL LAND CORPORATION; and JAGROOP S. GILL, Defendants.	NO. 21-2-01292-37 ORDER GRANTING INJUNCTIVE RELIEF TO PLAINTIFF

On March 4, 2021, Plaintiff State of Washington, Department of Ecology's ("Ecology") Motion for Permanent Injunctive Relief came before the Court. Ecology moved for a permanent injunction to permanently enjoin Campbell Land Corporation and Jagroop S. Gill ("Defendants") from interfering or restricting in any way entry and/or access by representatives from Ecology from entering upon property located at 4242 Aldergrove Road, Whatcom County, Washington, Whatcom County Assessor parcel number 3901083260850000 ("Property"), for the purpose of conducting:

1. An inspection, monitoring, and sampling of wastes at the Property to determine if there are violations of the State's Dangerous Waste regulations pursuant to RCW 70A.300.220(2)(d).

2. An inspection and investigation relating to the pollution of or the possible pollution of any of the waters of this state pursuant to RCW 90.48.090.

3. An investigation (including but not limited to inspecting, sampling, or testing) to determine the nature and extent of any of releases or threatened releases of hazardous substances that have occurred at the Property pursuant to the Model Toxics Control Act, RCW 70A.305.

The Court having heard argument, considered the records and files herein:

1. Plaintiff's Motion for Permanent Injunctive Relief.
2. Plaintiff's Brief in Support of Its Motion for Permanent Injunctive Relief.
3. Declaration of Stephanie Barney and the exhibits thereto.
4. Declaration of Mindy Collins and the exhibits thereto.
5. Declaration of Susan Dier and the exhibits thereto.
6. Declaration of Elizabeth Fint and the exhibits thereto.
7. Declaration of Victoria Sutton and the exhibit thereto.
8. Declaration of Chris Wilkerson and the exhibits thereto.
9. Declaration of John A. Level and the exhibits thereto.

Having fully considered the above record, the Court enters the following:

FINDINGS OF FACT

1. Whatcom County Assessor records establish that the Property is owned by the Campbell Land Corporation.

2. The Campbell Land Corporation was registered in the state of Nevada, Mr. Gill was the corporate officer for the Corporation, and the Corporation has dissolved.

3. The Property has been used historically for numerous industrial operations including the processing of tall oil, biodiesel refining, and other small-scale industrial ventures.

4. Environmental sampling of water, liquids, soils, and solids from the Property in 2000 indicated that the soils, tall oil rosin, water in the containment area, and sandblast grit area

were contaminated with total petroleum hydrocarbons, polynuclear aromatic hydrocarbons, and metals.

5. In April 2014, representatives from the Whatcom County Health Department conducted an inspection of the Property and observed that hazardous substances (bio-oil) quantities have been released to the grounds of the Property, and outside of the secondary containment structures for the industrial refinery tankage farms.

6. In September 2014, Ecology inspectors conducted a dangerous waste compliance inspection at the Property. The inspectors observed that many of the containers on the Property were rusted, corroded, and leaking. Ecology inspectors also saw that the containment areas at the Property were full of black liquid which appeared to be spilled tall oil, tall oil derivatives, biodiesel production wastes, and storm water, which was uncovered and open to the elements.

7. In May 2015, Ecology returned to the Property and took samples of a tote containing tall oil. Laboratory results from this sample demonstrated that the tall oil designated as toxic dangerous waste. Ecology inspectors observed that many of the containers, including those which held material reported to be tall oil, were open, rusty, unlabeled, and perforated. The containers at the Property were not being protected from the elements or from contamination.

8. In July 2015, Ecology's Hazardous Waste and Toxics Reduction Program issued an administrative enforcement order to Mr. Gill, Treoil Industries Ltd, Campbell Land Corporation, Farrington Financial Corporation, and TG Energy, which required the Property owner/operator to designate materials in specifically identified containers (per WAC 173-303-170(1)(a)) and submit a report to Ecology, obtain a RCRA site identification number, properly dispose of any dangerous waste at the Property, and file a dangerous waste annual report with Ecology. The Property Owner/Operator has failed to comply with the requirements of the administrative order.

9. The Property is subject to state industrial stormwater permitting requirements. Ecology issued the Property operator an Industrial Stormwater General Permit, which authorized

Treoil Industries Ltd. (Treoil) to discharge stormwater from its industrial activity to surface waters. Discharges from the facility are subject to complying with requirements specified in the permit. In December 2019, permit coverage lapsed for the Treoil site after Mr. Gill failed to reapply for the permit.

10. In April 2020, Ecology's Water Quality Program issued an administrative enforcement order to Mr. Gill, on behalf of Treoil Industries Ltd. and Campbell Land Corporation. Ecology issued this order due to Mr. Gill's failure to reapply for the Industrial Stormwater General Permit. Neither Treoil Industries Ltd. nor Campbell Land Corporation complied with the requirements of the Water Quality Program's administrative order and no appeal of the Order was ever filed.

11. In 2019 and 2021, Ecology made repeated attempts to gain permission from Mr. Gill and his representative to access the Property to conduct investigations and regulatory compliance inspections. Mr. Gill has denied or been unresponsive to Ecology's requests for access to the Property. Ecology staff have not been able to gain access to the Property since 2017.

12. Without access to the Property, Ecology staff are unable to conduct necessary inspections and sampling at the facility to determine if it is in compliance with the Dangerous Waste regulations and the State's Water Pollution Control statute or if conditions posed by releases or threatened releases of hazardous substances at the Property pose threats to the environment and human health.

Based on the above Findings of Fact, the Court enters the following:

CONCLUSIONS OF LAW

1. RCW 7.40.020 provides authority for the Court to grant injunctive relief.

2. The Hazardous Waste Management Act grants Ecology with the authority to enter at a reasonable time an establishment regulated under the Act for the purposes of inspection, monitoring, and sampling. RCW 70A.300.220(2)(d). An "establishment regulated under the

Act" includes a "facility," which "means all contiguous land and structures, other appurtenances, and improvements on the land used for recycling, storing, treating, incinerating, or disposing of hazardous waste." RCW 70A.300.010(8).

3. The State's Water Pollution Control Act, RCW 90.48, provides that Ecology "or its duly appointed agent shall have the right to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to the pollution of or the possible pollution of any of the waters of this state." RCW 90.48.090.

4. The State's Model Toxics Control Act (MTCA), RCW 70A.305, authorizes Ecology to enter upon private property to investigate releases of hazardous substances, including but not limited to inspecting, sampling, or testing to determine the nature or extent of any release or threatened release. RCW 70A.305.030(1)(a).

5. Ecology has established a clear legal right to enter the Property to: conduct an inspection and take samples concerning the dangerous waste located at the Property; inspect and investigate conditions on the Property related to possible pollution to waters of the state; and conduct an investigation of releases of hazardous substances to the environment at the Property.

6. Ecology's right and obligation to inspect facilities regulated by the Dangerous Waste regulations and Water Pollution Control Act, and investigating releases or threatened releases of hazardous substances under MTCA are jeopardized by not having access to the Property.

7. Without access to the Property, Ecology will be deprived of the ability to conduct: (a) an inspection and sampling at the Property to determine if it is in compliance with the Dangerous Waste regulations or if the Property's conditions are impacting or have potential to impact surface water and groundwater at the facility; and (b) a MTCA investigation of the Property.

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ORDER

Based on the above Findings of Fact and Conclusions of Law, THE COURT HEREBY ORDERS

1. That Ecology is granted a temporary injunction, which enjoins Defendants from in any way restricting entry and access by Ecology or its authorized employees, agents, or contractors from entering upon the Property for the purpose of conducting:

a. An inspection, monitoring, and sampling of wastes at the Property to determine if there are violations of the State's Dangerous Waste regulations pursuant to RCW 70A.300.220(2)(d).

b. An inspection and investigation relating to the pollution of or the possible pollution of any of the waters of this state pursuant to RCW 90.48.090.

c. An investigation (including but not limited to inspecting, sampling, or testing) to determine the nature and extent of any releases or threatened releases of hazardous substances that have occurred at the Property pursuant to RCW 70A.305.030(1)(a).

2. Ecology may take samples of any liquids or solids from secondary containment areas and of the contents in any containers (tanks, totes, and drums) at the Property. In addition, Ecology may collect samples of soil, surface water, or groundwater at any location at the Property.

3. Ecology shall have access to the Property to conduct these inspections and investigation actions for a period of one year from the date of entry of this Order.

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4. That the Court shall retain jurisdiction over this injunction so as to enforce its terms.

DATED this 11 day of ~~March~~ April 2022.

The Honorable David E. Freeman

Presented by:

ROBERT W. FERGUSON
Attorney General

JOHN A. LEVEL, WSBA #20439
Assistant Attorney General

Attorneys for Plaintiff
State of Washington
Department of Ecology
360-586-6753

Approved as to form and presentation waived:

Defendant(s)