APPENDIX G
Health and Safety Plan

Health and Safety Plan

Quiet Cove Property
Anacortes, Washington
Ecology Agreed Order No. DE 11346

for
Washington State Department of Ecology
on Behalf of Port of Anacortes

June 12, 2019

GeoEngineers
Earth Science + Technology

Health and Safety Plan

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GeoEngineers

Fourth and Blanchard Building
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Health and Safety Plan

Quiet Cove Property
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File No. 5147-024-07

June 12, 2019

Prepared for:

Washington State Department of Ecology
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Attention: Arianne Fernandez

On Behalf of:

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ATTACHMENTS

GEOENGINEERS, INC.
SITE HEALTH AND SAFETY PLAN
QUIET COVE
FILE NO. 5147-024-07

This Health and Safety Plan (HASP) is to be used in conjunction with the GeoEngineers, Inc. (GeoEngineers) Safety Programs. Together, the written safety programs and this HASP constitute the site safety plan for this site. This plan is to be used by GeoEngineers personnel on this site and must be available on site. If the work entails potential exposures to other substances or unusual situations, additional safety and health information will be included, and the plan will need to be approved by the GeoEngineers Health and Safety Program Manager. Plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Programs.

Liability Clause: If requested by subcontractors, this site HASP may be provided for informational purposes only. In this case, Form 1 shall be signed by the subcontractor. Please be advised that this site-specific HASP is intended for use by GeoEngineers employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this HASP. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by the company.

1.0 GENERAL PROJECT INFORMATION

Project Name:	Quiet Cove Property, Interim Cleanup Action (IA)
Project Number:	5147-024-07
Type of Project:	Site preparation including traffic control, erosion and sediment control, demolition, and utility management; remedial excavation including soil handling, stockpiling, transportation and off-site disposal; monitoring well installation; groundwater and soil sampling.
Start/Completion:	IA construction is expected to start in spring/summer 2020 and the construction duration is estimated to be approximately 4 months.
Subcontractors:	Earthwork contractor, Driller, and utility locate contractor

Chain of Command	Title	Name	Telephone Numbers
1	Project Manager	John Herzog	(c) 206.406.6431 (o) 206.239.3252
2	Site Safety Officer	TBD	TBD
3	Field Engineer/Geologist	TBD	TBD
4	Health and Safety Program Manager	Mary Lou Sullivan	(c) 360.633.9821 (o) 253.722.2425
N/A	Current Owner	Brad Tesch Project Coordinator Port of Anacortes	(c) 360.302.0974 (o) 360.299.1830
N/A	Subcontractor(s)	TBD	TBD

1.1. Functional Responsibility

1.1.1. Project Manager

The Project Manager (PM) is responsible for fulfilling contractual and administrative control of the project. The Project Manager's duties include defining the project approach and tasks, selecting project team members and establishing budgets and schedules.

The Project Manager's duties also include implementing the project approach and tasks, overseeing project team members during performance of project tasks, adhering to and communicating the status of budgets and schedules to the Port, providing technical oversight, and providing overall production and review of project deliverables. The Project Manager shall maintain the official, approved Interim Action Work Plan and supporting documents, and shall be responsible for distributing updated documents to the project team.

1.1.2. Site Safety Officer

The Site Safety Officer (SSO) will have the on-site responsibility and authority to modify and stop work, or remove personnel from the site if working conditions change that may affect on-site and off-site health and safety. The SSO will be the main contact for any on-site emergency situation. The SSO is First Aid and CPR qualified, and has current Hazardous Waste Operations and Emergency Response (HAZWOPER) training. The SSO is responsible for implementing and enforcing the project safety program and safe work practices during site activities. The SSO shall conduct daily safety meetings, perform air monitoring as required, conduct site safety inspections as required, coordinate emergency medical care, and ensure personnel are wearing the appropriate personal protective equipment (PPE). The SSO shall have advanced field work experience and shall be familiar with health and safety requirements specific to the project. The SSO has the authority to suspend site activities if unsafe conditions are reported or observed.

Duties of the SSO include the following:

- Implementing the HASP in the field and monitoring compliance with its guidelines by staff.
- Being sure that GeoEngineers field personnel have met the training and medical examination requirements. Advising other contractor employees of these requirements.
- Maintaining adequate and functioning safety supplies and equipment at the site.
- Setting up work zones, markers, signs and security systems, if necessary.
- Performing or supervising air quality measurements. Communicating information on these measurements to GeoEngineers field staff and subcontractor personnel.
- Communicating health and safety requirements and site hazards to field personnel, subcontractors and contractor employees, and site visitors.
- Directing personnel to wear PPE and guiding compliance with health and safety practices in the field.
- Consulting with the PM regarding new or unanticipated site conditions, including emergency response activities. If monitoring detects concentrations of potentially hazardous substances at or above the established exposure limits, notify/consult with the PM. Consult with the PM and the Health and Safety Program Manager (HSM) regarding new or unanticipated site conditions, including emergency

response activities. If field monitoring indicates concentrations of potentially hazardous substances at or above the established exposure limits, the HSM must be notified and corrective action taken.

- Documenting site accidents, illnesses and unsafe activities or conditions, and reporting them to the PM and the HSM.
- Directing decontamination operations of equipment and personnel.

1.1.3. Field Engineer/Geologist

The Field Engineer/Geologist working on-site that has the potential of coming in contact with hazardous substances or physical hazards is responsible for participating in the health and safety program and complying with the site-specific HASP. These personnel are required to:

- Participate and be familiar with the health and safety program as described in this manual.
- Notify the SSO when there is need to stop work to address an unsafe situation.
- Comply with the HASP and acknowledge understanding of the plan.
- Report to the SSO, PM or HSM any unsafe conditions and all facts pertaining to incidents or accidents that could result in physical injury or exposure to hazardous materials.
- Participate in health and safety training, including initial 40-hour Occupational Safety and Health Administration (OSHA) course, annual 8-hour HAZWOPER refresher, and First Aid/cardiopulmonary resuscitation (CPR) training.
- Participate in the medical surveillance program if applicable.
- Schedule and take a respirator fit test annually.
- Any field employee working onsite may stop work if the employee believes the work is unsafe.

1.1.4. Health and Safety Program Manager

The Health and Safety Program Manager (HSM) is responsible for implementing and promoting employee participation in the program. The HSM issues directives, advisories and information regarding health and safety to the technical staff. Additionally, the HSM has the authority to audit on-site compliance with Health and Safety Plans (HASPs), suspend work or modify work practices for safety reasons, and dismiss from the site any GeoEngineers or subcontractor employees whose conduct on the site endangers the health and safety of themselves or others.

1.1.5. Port of Anacortes Project Coordinator

The Port of Anacortes (Port) Project Coordinator's duties consist of implementing the project approach and tasks, overseeing the project team members during performance of project tasks.

1.1.6. Subcontractors Under GeoEngineers Supervision

Subcontractors working on the site under GeoEngineers supervision or direct control that have the potential of coming in contact with hazardous substances or physical hazards shall have their own health and safety program that is in line with the site-specific HASP.

1.2. List of Field Personnel and Training

Anticipated field personnel include the following:

- Nate Solomon
- Dexter Chan
- Katy Atakturk

Field personnel will have appropriate training and up to date certifications.

1.3. Site Description

The Quiet Cove property is located at 202 O Avenue in Anacortes, Washington, southeast of Guemes Channel. The property is approximately 0.8 acres in size and is located at the intersection of 2nd Street and O Avenue. The Site is bordered to the north by 2nd Street, east by O Avenue and south by 3rd Street. The western portion of the property borders a Port of Anacortes owned storage yard and a bulk fuel distribution facility owned and operated by Texaco/Reisner.

The Quiet Cove Property is generally flat. The property and surrounding area is paved with concrete or asphalt with the exception of planter strips located on the 2nd and 3rd Street, and O Avenue Rights-of-Way (ROW) and surface areas of 2nd Street, adjacent Port and Texaco/Reisner properties located in the west are primarily contain gravel surface. Stormwater runoff at the Site is collected in catch basins that discharge to the City of Anacortes stormwater system. Currently, two warehouse buildings are present in the northwest portion of the property. One of the warehouse building also has a combined office. A chain link fence surrounds the property preventing general public access. Vehicle and pedestrian access to the property is through gated entrance south of 2nd Street.

1.4. Site History

The property was historically used for bulk fuel distribution from 1909 to at least 1977 (the date when fuel operations ceased is unknown). Fuel (primarily gasoline and diesel) was supplied to the facility from product lines routed from the property north across 2nd Street to the pier face of Curtis Wharf. While operating as a bulk fuel storage and distribution facility, fuel was stored in above ground storage tanks (ASTs) for general distribution. During the late 1970s, the bulk fuel facility was decommissioned and all of the ASTs and associated structures removed. Between 1977 and 2014, the property was operated as a storage yard for marine vessels and recreational vehicles, and leased office and warehouse space to various tents for sales and marine services. In 2013, the property was purchased by the Port as part of their plans for expansion and improvements to the Curtis Wharf International Shipping Terminal.

2.0 WORK PLAN

2.1. Project Description and Objectives

Remedial excavation activities will be completed to remove contaminated soil within the Property boundary where historical uses have resulted in a release or releases to the environment. The scope of work for GeoEngineers includes:

- Observing site preparation activities including installation of temporary traffic controls, erosion and sediment control, demolition of two existing buildings on the Property, utility location and management, etc.
- Assisting the cleanup contractor in identifying the contact between overburden and underlying contaminated soil;
- Identifying the initial limits of excavation based on field screening results;
- Obtaining soil samples from the limits of excavation and submitting soil samples to an Ecology accredited laboratory for chemical analysis;
- Observing excavated material handling, stockpiling and loading activities;
- Oversight of backfill and the placement of oxygen releasing chemicals for enhancing biodegradation of residual contaminants that are expected to remain in place adjacent to the Property in the east, north and west;
- Site restoration oversight following completion of remedial excavation activities;
- Observing installation and development of groundwater monitoring wells following the completion of interim action construction activities; and
- Obtaining groundwater samples from existing and newly installed monitoring wells to evaluate post-construction groundwater conditions at the Site. Groundwater samples will be submitted for chemical analysis to an Ecology-accredited laboratory.

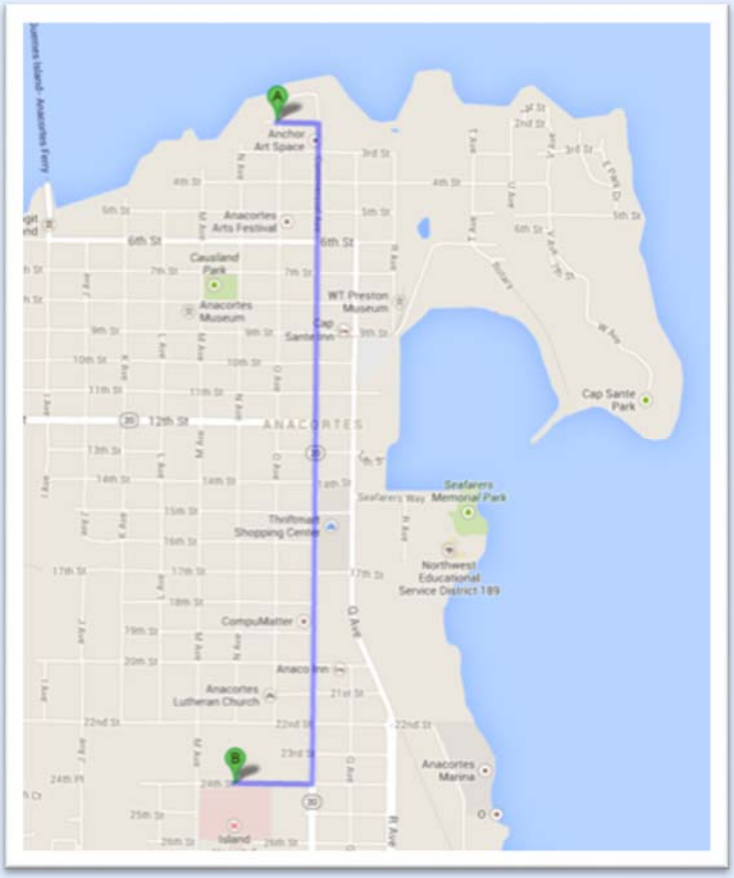
The interim action remedial excavation will remove contaminated soil on the Quiet Cove property, to the extents practicable. The remedial excavation activities, including sample locations and laboratory analyses are detailed in the Interim Action Work Plan.

2.2. List of Field Activities

Anticipated field activities to be completed during the project:

Y/N	Field Activity	Y/N	Field Activity
Y	Site Reconnaissance	N	Vapor Measurements
N	Exploratory Borings	N	Product Sample collection
Y	Construction Monitoring	Y	Soil Stockpile Testing
Y	Surveying	Y	Remedial Excavation
N	Test Pit Exploration	N	Recovery of Free Product
Y	Soil Sample Collection	Y	Monitoring Well Installation
Y	Groundwater Sampling	Y	Monitoring Well Development
N	Sediment Sampling	N	Underground Storage Tank (UST) Removal Monitoring
Y	Groundwater Depth/Free Product Measurement	N	Other:

3.0 EMERGENCY INFORMATION

Hospital Name and Address:	Island Hospital 1211 24th Street Anacortes, WA 98221
Phone Numbers (Hospital ER):	**Phone**: 360.468.3185/360.299.1300
Distance:	1.5 Miles
Route to Hospital: 1) Head east on 2nd St toward O Ave – 410 feet 2) Turn right onto Commercial Ave – 1.2 mile 3) Turn right onto 24th Street – 0.1 mile 4) Arrive at 1211 24th St, Anacortes	
Ambulance:	9-1-1
Poison Control:	Seattle 206.253.2121; Other 800.732.6985
Police:	9-1-1
Fire:	9-1-1
Location of Nearest Telephone:	Cell phones are carried by field personnel.
Nearest Fire Extinguisher:	Located in the GeoEngineers vehicle on-site.
Nearest First-Aid Kit:	Located in the GeoEngineers vehicle on-site.

3.1. Standard Emergency Procedures

- Get help

- Send another worker to phone 9-1-1 (if necessary)
- As soon as feasible, notify GeoEngineers' Project Manager

- Reduce risk to injured person
  - Turn off equipment
  - Move person from injury location (if in life-threatening situation only)
  - Keep person warm
  - Perform CPR (if necessary)
- Transport injured person to medical treatment facility (if necessary)
  - By ambulance (if necessary) or GeoEngineers vehicle
  - Stay with person at medical facility
  - Keep GeoEngineers Project Manager apprised of situation and notify Human Resources Manager of situation

3.2. Emergency Response

- Visual contact should be maintained between "pairs" on site, with the team remaining in proximity to assist each other in case of emergencies.
- If any member of the field crew experiences any adverse exposure symptoms while on site, the entire field crew should immediately halt work and act according to the instructions provided by the SSO.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.
- If an accident occurs, the Site Safety Officer and the injured person are to complete, within 24 hours, an Accident Report (Form 3) for submittal to the PM, the HSPM, and HR. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

4.0 HAZARD ANALYSIS

A hazard analysis has been completed as part of preparation of this HASP. The hazard analysis was performed taking into account the known and potential hazards at the site and surrounding areas, as wells as the planned work activities. The results of the hazard analysis are presented in this section. The hazard assessment will be evaluated each day before beginning work. Updates will be made as necessary and documented in the daily field log.

The following are known applicable hazards.

4.1. Physical Hazards and Mitigation Measures/Procedures

PHYSICAL HAZARDS (POTENTIALLY PRESENT AT THE SITE)

Y/N	Physical Hazard
Y	Drill rigs and Concrete Coring, including working inside a warehouse
Y	Backhoe

Y/N	Physical Hazard
Y	Trackhoe
N	Crane
Y	Front End Loader
Y	Excavations/trenching (1:1 slopes for Type B soil)
Y	Shored/braced excavation if greater than 4 feet of depth
Y	Overhead hazards/power lines
Y	Tripping/puncture hazards (debris on-site, steep slopes or pits)
Y	Unusual traffic hazard – Street traffic
Y	Heat/Cold, Humidity
Y	Utilities/ utility locate
Y	Noise
N	Other:

4.1.1. Mitigation Measures/Procedures

- A utility locate shall be completed, as required, for the location to prevent drilling or digging into utilities.
- Work areas will be marked with reflective cones, barricades and/or caution tape. High-visibility vests will be worn by on-site personnel to ensure they can be seen by vehicle and equipment operators.
- Field personnel will be aware of the location and motion of heavy equipment in the area of work to ensure a safe distance between personnel and the equipment. Personnel will be visible to the operator at all times and will remain out of the swing and/or direction of the equipment apparatus. Personnel will approach operating heavy equipment only when they are certain the operator has indicated that it is safe to do so through hand signal or other acceptable means.
- Heavy equipment and/or vehicles used on this site will not work within 20 feet of overhead utility lines without first ensuring that the lines are not energized. This distance may be reduced to 10 feet, depending on the client and the use of a safety watch.
- Personnel entry into unshored or unsloped excavations deeper than 4 feet is not allowed. Any trenching and shoring requirements will follow guidelines established in Washington Administrative Code (WAC) 296-155, the Washington State Construction Standards or OSHA 1926.651 Excavation Requirements. In the event that a worker is required to enter an excavation deeper than 4 feet, a trench box or other acceptable shoring will be employed or the side walls of the excavation will be sloped according to the soil type and guidelines as outlined in Department of Occupational Safety and Health (DOSH) and OSHA regulations. If the shoring/sloping deviates from that outlined in the WAC, it will be designed and stamped by a Professional Engineer (PE). Prior to entry, personnel will conduct air monitoring as described later in this plan. All hazardous encumbrances and excavated material will be stockpiled at least 2 feet from the edge of a trench or open pit. If concentrations of volatile gases accumulate within an open trench or excavation, the means of entering shall adhere to confined space entry and air monitoring procedures outlined under the air monitoring recommendations in this Plan and/or the GeoEngineers Health and Safety Programs.

- Personnel will avoid tripping hazards, steep slopes, pits and other hazardous encumbrances. If it becomes necessary to work within 6 feet of the edge of a pit, slope or other potentially hazardous area, appropriate fall protection measures will be implemented by the Site Safety Officer in accordance with OSHA/DOSH regulations and the GeoEngineers Health and Safety Program.
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this site will be implemented according to GeoEngineers Health and Safety Program with water provided on-site.

4.1.2. Engineering Controls

Y/N	Engineering Control
Y	Trench shoring (1:1 slope for Type B Soils)
Y	Location work spaces upwind/wind direction monitoring
N	Other soil covers (as needed)
N	Other (specify): Click here to enter text.

4.2. Biological Hazards and Mitigation Measures/Procedures

BIOLOGICAL HAZARDS (POTENTIALLY PRESENT AT SITE)

Y/N	Biological Hazard	Mitigation Measure/Procedure
N	Poison Ivy or other vegetation	Work gloves and long sleeve shirt
Y	Insects or snakes	Work gloves and long sleeve shirt
N	Hypodermic needles or other infectious hazards	Do not pick up or contact
N	Wildlife	
Y	Other: Bird droppings	Hard hat, gloves and long sleeve shirt

4.3. Ergonomic Hazards and Mitigation Measures/Procedures

4.3.1. Lifting Injuries

Back injuries often result from lifting objects that are too heavy or from using the wrong lifting technique. Keep your back healthy and pain-free by following common sense safety precautions.

- Minimize reaching by keeping frequently used items within arm's reach, moving your whole body as close as possible to the object.
- Avoid overextending by standing up when retrieving objects on shelves.
- Keep your back in shape with regular stretching exercises.
- Get help from a coworker or use a hand truck if the load is too heavy or bulky to lift alone.

4.3.2. Lifting Techniques

- Face the load; don't twist your body. Stand in a wide stance with your feet close to the object.
- Bend at the knees, keeping your back straight. Wrap your arms around the object.
- Let your legs do the lifting.
- Hold the object close to your body as you stand up straight. To set the load down, bend at the knees, not from the waist.

4.4. Chemical Hazards

CHEMICAL HAZARDS (POTENTIALLY PRESENT AT SITE)

Substance	Pathways
Petroleum Products Gasoline Diesel Heavy oil Waste oil	Air/Soil/Water
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) and Naphthalenes	Air/Soil/Water
Halogenated Volatile Organic Compounds	Air/Soil/Water
Volatile Organic Compounds (VOCs) Benzene, ethylbenzene, toluene, xylenes (BETX) n-Hexane Methyl tertiary-butyl ether (MTBE) 1,2-dibromoethane (EDB) 1,2-dichloroethane (EDC)	Air/Soil/Water
Metals Arsenic Cadmium Chromium Lead Mercury	Air/Soil/Water

SPECIFIC CHEMICAL HAZARDS AND EXPOSURES (POTENTIALLY PRESENT AT SITE)

Chemical or Compound/ Description	Exposure Limits/ IDLH	Exposure Route	Immediate Symptoms of Exposure/Health Effects
Arsenic	PEL 0.05 mg/m^3 IDLH 5.0 mg/m^3	Inhalation, skin absorption, skin and eye contact, ingestion	Ulceration of nasal septum; dermatitis; GI disturbances; peripheral neuropathy; respiratory irritation; hyperpigmentation of skin

Chemical or Compound/ Description	Exposure Limits/ IDLH	Exposure Route	Immediate Symptoms of Exposure/Health Effects
Cadmium	PEL 0.005 mg/m3 IDLH 9 mg/m3	respiratory system, kidneys, prostate, blood	Pulmonary edema, dyspnea (breathing difficulty), cough, chest tightness, substernal (occurring beneath the sternum) pain; headache; chills, muscle aches; nausea, vomiting, diarrhea; anosmia (loss of the sense of smell), emphysema, proteinuria, mild anemia; [potential occupational carcinogen]
Chromium	PEL 1 mg/m^3 IDLH 250 mg/m^3	Inhalation, ingestion, skin and eye contact	Irritated eyes, skin respiratory system
Lead	PEL 0.05 mg/m^3 IDLH 100 mg/m^3	Inhalation, ingestion, skin and eye contact	Lassitude; insomnia; facial pallor; abnormalities; weight loss, malnutrition, constipation, abdominal pain; colic; anemia; gingival lead line; tremors; paralysis of the wrist and ankles; encephalopathy; kidney disease; irritated eyes; hypertension
Mercury	PEL 0.05 mg/m^3 IDLH 10 mg/m^3	Inhalation, skin absorption, skin and eye contact, ingestion	Irritated eyes, skin; cough, chest pain, dyspnea, bronchitis, pneumonia; tremors, insomnia, irritability, indecision, headache, lassitude; stomatitis, salivation; GI disturbances, abnormalities, low weight; proteinuria
Gasoline (Unleaded) — clear liquid with a characteristic odor	PEL 300 ppm TLV 300 ppm STEL 500 ppm	Ingestion, inhalation, skin absorption, skin and eye contact	Irritated eyes, skin, and mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; headache; dermatitis
Diesel Fuel — liquid with a characteristic odor	None established by OSHA, but ACGIH has adopted 100 mg/m3 for a TWA (as total hydrocarbons)	Ingestion, inhalation, skin absorption, skin and eye contact	Irritated eyes, skin, and mucous membrane; fatigue; blurred vision; dizziness; slurred speech; confusion; convulsions; headache; dermatitis
Waste oil – may contain metals, gas, antifreeze and PAHs	Depends on the ancillary contaminants	Ingestion, inhalation, skin absorption, skin and eye contact	Depends on the ancillary contaminants.
Lube Oil/Mineral Oil – as a mist	The current OSHA PEL for mineral oil mist is 5 mg/m3 of air as an 8-hr TWA	If the oil is not a mist, then route of exposure is skin and eye contact	Exposure to oil mists can cause eye, skin and upper respiratory tract irritation.

Chemical or Compound/ Description	Exposure Limits/ IDLH	Exposure Route	Immediate Symptoms of Exposure/Health Effects
Benzene	OSHA PEL 1 ppm Short term: 5 ppm ACGIH PEL 0.5 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritated eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]
Toluene	PEL 100 ppm IDLH 500 ppm	Inhalation, absorption, ingestion, direct contact	Irritation to eyes, nose, exhaustion, confusion, dizziness, headaches, dilated pupils, euphoria, anxiety, teary eyes, muscle fatigue, insomnia, paresthesia, dermatitis, liver and kidney damage.
Ethyl benzene	PEL 100 ppm IDLH 800 ppm	Inhalation, ingestion, direct contact	Irritation to eyes, skin, respiratory system, burning
Xylenes	PEL 100 ppm IDLH 900 ppm	Inhalation, skin absorption, ingestion, direct contact	Irritation to eyes, skin, nose, throat, dizziness, excitement, drowsiness, incoordination, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal
MTBE	PEL 40 ppm	Ingestion, Inhalation, skin absorption, direct contact	Irritation to eyes, skin, nose, throat and lungs, aspiration, chemical pneumonia, nausea, vomiting, diarrhea, tremors, convulsions, loss of consciousness, headache, dizziness, loss of balance or coordination.
Polycyclic aromatic hydrocarbons (PAH) as coal tar pitch volatiles	PEL 0.2 mg/m^3 TLV 0.2 mg/m^3 REL 0.1 mg/m^3 IDLH 80 mg/m^3	Inhalation, ingestion, skin and/or eye contact	Dermatitis, bronchitis, potential carcinogen

Notes:

IDLH = immediately dangerous to life or health
OSHA = Occupational Safety and Health Administration
ACGIH = American Conference of Governmental Industrial Hygienists
mg/m^3 = milligrams per cubic meter
TWA = time-weighted average (Over 8 hrs.)
PEL = permissible exposure limit
TLV = threshold limit value (over 10 hrs)
STEL = short-term exposure limit (15 min)
ppm = parts per million

4.4.1. Mitigation Measures/Procedures

- **Construction Observation, sample handling, packaging, and processing:** skin contact with contaminated media and preservative acids. Wear modified Level D personal protective equipment (PPE).

- **Groundwater Sampling:** Splash hazard associated with groundwater extraction and sample collection. Possible corrosion hazard associated with sample preservatives. Wear protective clothing and eye protection and chemical-resistant gloves are required when handling samples.
- **Decontamination of equipment:** inhalation or eye contact or skin contact with airborne mists or vapors, or contaminated liquids. Wear safety glasses; decontaminate clothing and skin prior to eating, drinking or other hand to mouth contact.

4.5. Additional Hazards

Update in Daily Report. Include evaluation of:

- Physical Hazards (excavations and shoring, equipment, traffic, tripping, heat stress, cold stress and others).
- Chemical Hazards (odors, spills, free product, airborne particulates and others present).
- Biological Hazards (snakes, spiders, other animals, discarded needles, poison ivy, pollen, bees/wasps and others present).

5.0 AIR MONITORING PLAN

An air monitoring plan has been prepared as part of development of this HASP. The air monitoring plan is based on the results of the chemical exposure assessment and the known and potential inhalation hazards on-site. The air monitoring plan addresses steps necessary to limit worker exposure. Non-occupational exposures are not addressed in this plan. When possible, position yourself up upwind of the field activity.

FIELD INSTRUMENTATION

Applicable Field Instrumentation	
X	Multi-Gas Detector (may include oxygen, carbon monoxide, hydrogen sulfide, lower explosive limit)
	Dust Monitor
	Other (i.e., detector tubes or badges) Please specify: Click here to enter text.

MONITORING FREQUENCY

Applicable Monitoring Frequency/Locations and Type	
X	Continuous during soil disturbance activities or handling samples
	15 minutes
	30 minutes
	Hourly

5.1. Action Levels for Volatile Organic Chemicals

- The workspace will be monitored using a photoionization detector (PID). These instruments must be properly maintained, calibrated and charged (refer to the instrument manuals for details). Zero this

meter in the same relative humidity as the area in which it will be used and allow at least a 10-minute warm-up prior to zeroing. Do not zero in a contaminated area.

- An initial vapor measurement survey of the site should be conducted to detect "hot spots" if contaminated soil is exposed at the surface. Vapor measurement surveys of the workspace should be conducted at least hourly or more often if persistent petroleum-related odors are detected. Additionally, if vapor concentrations exceed 5 parts per million (ppm) above background continuously for a 5-minute period as measured in the breathing zone, upgrade to Level C personal protective equipment (PPE) or move to a non-contaminated area.
- Standard industrial hygiene/safety procedure is to require that action be taken to reduce worker exposure to organic vapors when vapor concentrations exceed one-half the threshold limit value (TLV). Because of the variety of chemicals, the PID will not indicate exposure to a specific permissible exposure limit (PEL) and is therefore not a preferred tool for determining worker exposure to chemicals. If odors are detected, then employees shall upgrade to respirators with Organic Vapor cartridges and will contact the Health and Safety Program Manager for other sampling options.

AIR MONITORING ACTION LEVELS

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	Background to 5 ppm in breathing zone	Use Level D or Modified Level D PPE
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes and in event of odors	5 to 50 ppm in breathing zone	Upgrade to Level C PPE *
Organic Vapors	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	> 50 ppm in breathing zone	Stop work and evacuate the area. Contact Health and Safety Program Manager for guidance.
Combustible Atmosphere	Environmental Remedial Actions	PID	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Depends on contaminant. The PEL is usually exceeded before the lower explosive limit (LEL).
Combustible Atmosphere	Environmental Remedial Actions	PID or 4-gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	>10% LEL or >1,000 ppm	Stop work and evacuate the site. Contact Health and Safety Program Manager for guidance.

Contaminant	Activity	Monitoring Device	Frequency of Monitoring Breathing Zone	Action Level	Action
Oxygen Deficient/ Enriched Atmosphere	Environmental Remedial Actions Confined Spaces	Oxygen meter or 4-gas meter	Start of shift; prior to excavation entry; every 30 to 60 minutes	<19.5 >23.5%	Continue work if inside range. If outside range, evacuate area and contact Health and Safety Program Manager.

*Contact the HSPM and Project Manager

6.0 SITE CONTROL PLAN

Use this section to provide an up-to-date Site Control Plan for cleanup operations to minimize employee exposure to hazardous substances.

6.1. Traffic or Vehicle Access Control Plans

A Right-of-Way/Public Works Permit will be obtained from the City of Anacortes for excavation that may extend into or near sidewalks and on roads, including preparation of a streamlined traffic control plan, if needed. Flagging and traffic control, if needed, will be performed by the earthwork contractor or their subcontractor. All persons contracting to perform flagging will have on site a current flagging card indicating that they are trained.

Traffic control procedures and devices must be used in accordance with Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) and Washington Safety and Health Standard WAC 296-155-305. Where flaggers are needed, supervisor must ensure that each flagger has the qualifications, training and equipment necessary to perform assigned task in accordance with the MUTCD. Training must be updated every 3 years. At a minimum, flaggers must have a stop/slow paddle, high visibility clothing, safety shoes, and a hard hat, before approaching any right of way to control traffic.

6.2. Site Work Zones

Fencing (chain link, orange construction netting, silt fence or similar), Survey Tape, Traffic Cones, Posted signage and/or barricades will be used to delineate the work zone and excluding non-site personnel from entering the work zone.

Exclusion zones will be established within approximately 10 feet around the remedial excavation, boring or well during drilling/sampling. Only persons with the appropriate training will enter this perimeter while work is being conducted there.

A contamination reduction zone will be established just outside the exclusion zone for the decontamination of sampling equipment. Care will be taken to prevent the spread of contamination. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Scrub brushes
- Spray rinse applicator

- Plastic garbage bags
- Container of Alconox/water solution and Alconox powder
- Exclusion zone (Approximately 10 to 15 feet around boring locations).

METHOD OF DELINEATION/EXCLUDING NON-SITE PERSONNEL

Applicable Delineation/Exclusion Methods	
X	Fence
	Survey Tape
X	Traffic Cones
	Other

6.3. Buddy System

Personnel on-site should use the buddy system (pairs), particularly whenever communication is restricted. If only one GeoEngineers employee is on site, a buddy system can be arranged with subcontractor/ contractor personnel.

6.4. Site Communication Plan

Positive communications (within sight and hearing distance or via radio) should be maintained between pairs on-site, with the pair remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown) and an agreed upon location for an emergency assembly area.

In instances where communication cannot be maintained, you should consider suspending work until it can be restored. If this is not an option, the following are some examples for communication:

- Hand gripping throat: Out of air, can't breathe.
- Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
- Hands on top of head: Need assistance.
- Thumbs up: Okay, I'm all right; or, I understand.
- Thumbs down: No, negative.

6.5. Emergency Action

In the event of an emergency, employees with convene in a designated area. Employees should communicate with others working on site and the PM to determine the Emergency Action Plan for each site. GeoEngineers employees and subcontractor(s) should be made aware of the Emergency Action for the site at each morning's safety tailgate meeting (drill rig shutoff switch, location of fire extinguishers, cell phone numbers, etc.). For medical assistance, see Section 3.0 above.

6.6. Decontamination Procedures

Decontamination, at a minimum, should include removing and disposing of PPE when exiting the exclusion zone and washing your hands. Decontamination may also consist of removing outer protective gloves and washing soiled boots and gloves using bucket and brush provided on-site in the contamination reduction zone. If needed, inner gloves will then be removed, and respirator, hands and face will be washed in either a portable wash station or a bathroom facility at the site. Employees will perform decontamination procedures and wash before eating, drinking or leaving the site.

6.7. Waste Disposal or Storage

Incidental waste including used PPE is to be placed in a plastic bag for disposal. Investigation derived waste (IDW) will be place in 35/55-gallon drums and stored on site in a secure location pending characterization and disposal.

7.0 PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) will consist of standard Level D equipment. Site activities include handling and sampling of soil, groundwater and sediment. Depth-to-groundwater measurements will be performed as well. Site hazards include potential exposure to hazardous materials, and physical hazards such as trips/falls, heavy equipment, and contaminant exposure.

Air monitoring will be conducted to determine the level of respiratory protection.

- Half-face combination organic vapor/high efficiency particulate air (HEPA) or P100 cartridge respirators will be available on site to be used as necessary. P100 cartridges are to be used only if PID measurements are below the site action limit. P100 cartridges are used for protection against dust, metals and asbestos, while the combination organic vapor/HEPA cartridges are protective against both dust and vapor. Ensure that the PID or TLV will detect the chemicals of concern on-site.
- Level D PPE, unless a higher level of protection is required, will be worn on the site. Potentially exposed personnel will wash gloves, hands, face and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating, smoking, etc.
- Adequate personnel and equipment decontamination will be used to decrease potential ingestion and inhalation.

PERSONAL PROTECTIVE EQUIPMENT

Applicable Personal Protection Equipment	
Field Equipment (specify):	
X	Hardhat (if overhead hazards, or client requests)
X	Steel-toed boots (if crushing hazards are a potential or if client requests)
X	Safety glasses (if dust, particles, or other hazards are present or client requests)
X	Reflective vest (if working near traffic or equipment)
X	Hearing protection (if it is difficult to carry on a conversation 3 feet away)
X	Rubber boots (if wet conditions)
Gloves (specify):	
X	Nitrile
	Latex
	Liners
	Leather
	Other (specify) Click here to enter text.
Protective Clothing (specify):	
	Tyvek (if dry conditions are encountered, Tyvek is sufficient) (modified Level D or Level C)
	Saranex (personnel shall use Saranex if liquids are handled or splash may be an issue) (modified Level D or Level C)
X	Cotton (Level D)
X	Rain gear (as needed) (Level D)
X	Layered warm clothing (as needed) (Level D)
Inhalation Hazard Protection (specify):	
X	Level D (no respirator)
	Level C (respirators with organic vapor/HEPA P100 filters)
	Level B (Self Contained Breathing Apparatus— STOP, Consult the HSM)

7.1. Personal Protective Clothing Inspections

PPE clothing ensembles designated for use during site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures or other defects. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.

- Inspect PPE during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears or other signs of punctures. If the integrity of the PPE is compromised in any manner, proceed to the contamination reduction zone and replace the PPE.
- Disposable PPE should not be reused after breaks unless it has been properly decontaminated.

7.2. Respirator Selection, Use and Maintenance

If respirators are required, site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear respiratory protection in accordance with 29 CFR 1910.134. Site personnel who will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

7.3. Respirator Cartridges

If the action levels identified in the Air Monitoring Action Levels Table in Section 5.0, are exceeded, site personnel should don respiratory protection appropriate for the known or suspected chemical of concern. For most sites, a half-face or full-face air purifying respirator with a National Institute for Occupational Safety and Health (NIOSH)-approved organic vapor/HEPA P100 combination cartridge (Level C), will be appropriate for the known or suspected chemicals of concern. Monitoring frequency should be continuous while using Level C respiratory protection. The SSO closely monitor personnel using respiratory protection, including observing for signs of fatigue or respiratory distress, the potential for cartridge breakthrough or increased resistance to inhalation, and the need for changes in the level of respiratory protection based on air monitoring. The frequency and duration of breaks should be increased for personnel working in respiratory protection. If at any time on-site air monitoring indicates Level B respiratory protection is warranted, personnel should leave the exclusion zone and consult with the HSM.

If site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated site contaminants. The respirator/cartridge combination shall be approved and NIOSH-certified. A cartridge change-out schedule shall be developed based on known site contaminants, anticipated contaminant concentrations and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste or feel, although breakthrough is not an acceptable method of determining the change-out schedule.

7.4. Respirator Inspection and Cleaning

The Site Safety Officer shall periodically (weekly) inspect respirators at the project site. Site personnel shall inspect respirators prior to each use in accordance with the manufacturer's instructions. In addition, site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned, to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer's instructions.

8.0 ADDITIONAL ELEMENTS

8.1. Heat/Cold Stress

8.1.1. Cold Stress Prevention

Working in cold environments presents many hazards to site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature).

The combination of wind and cold temperatures increases the degree of cold stress experienced by site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments, and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

8.1.2. Heat Stress Prevention

Keeping workers hydrated in a hot outdoor environment requires more water be provided than at other times of the year. When employee exposure is at or above an applicable temperature listed in the Heat Stress table below, Project Managers will ensure that:

- A sufficient quantity of drinking water is readily accessible to employees at all times; and
- All employees have the opportunity to drink at least one quart of drinking water per hour.

HEAT STRESS

Type of Clothing	Outdoor Temperature Action Levels
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
All other clothing	89°

8.2. Personnel Medical Surveillance

GeoEngineers employees are not in a medical surveillance program because they do not fall into the category of "Employees Covered" in OSHA 1910.120(f)(2), which states that a medical surveillance program is required for the following employees:

1. Employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year;
2. Employees who wear a respirator for 30 days or more a year or as required by state and federal regulations;
3. Employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation; and

4. Members of HAZMAT teams.

8.3. Spill Containment Plans (Drum and Container Handling)

Contractors or subcontractors will be responsible for developing and implanting Spill Prevention and Containment Plans for use during Site work.

8.4. Entry Procedures for Tanks or Vaults (Confined Spaces)

GeoEngineers employees shall not enter confined spaces to perform work unless they have been properly trained and with hands-on experience in the use of retrieval equipment. If a project requires confined space entry, please include a copy of the confined space permit and include the training documentation in this HASP.

Trenches greater than 4 feet in depth with the potential for buildup of a hazardous atmosphere are considered confined spaces.

8.5. Sanitation

Portable toilets will be provided during work activities.

8.6. Lighting

Work is anticipated to be performed during daylight hours. Artificial lighting will be used as necessary if work is conducted after daylight hours.

9.0 DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS

The following forms shall be completed:

- Daily Field Log (include the following information)
  - Updates on hazard assessments, field decisions, conversations with subcontractors, client or other parties, etc.;
  - Air monitoring/calibration results, including: personnel, locations monitored, activity at the time of monitoring, etc.;
  - Actions taken;
  - Action level for upgrading PPE and rationale; and
  - Meteorological conditions (temperature, wind direction, wind speed, humidity, rain, snow, etc.).
- FORM 1 – Health and Safety Pre-Entry Briefing and Acknowledgment of the Site Health and Safety Plan for GeoEngineers' Employees, Subcontractors and Visitors
- FORM 2 – Safety Meeting Record
- FORM 3 – Accident/Exposure Report Form

FORM 1
HEALTH AND SAFETY PRE-ENTRY BRIEFING AND ACKNOWLEDGEMENT OF THE SITE HEALTH AND SAFETY PLAN FOR GEOENGINEERS' EMPLOYEES, SUBCONTRACTORS AND VISITORS
QUIET COVE PROPERTY
FILE NO. 5147-024-07

Inform employees, contractors and subcontractors or their representatives about:

- The nature, level and degree of exposure to hazardous substances they're likely to encounter;
- Site-related emergency response procedures; and
- Any identified potential fire, explosion, health, safety or other hazards.

Conduct briefings for employees, contractors and subcontractors, or their representatives as follows:

- A pre-entry briefing before any site activity is started.
- Additional briefings, as needed, to make sure that the Site-specific HASP is followed.
- Make sure employees working on the Site are informed of any risks identified and trained on how to protect themselves and other workers against the Site hazards and risks.
- Update information to reflect current sight activities and hazards.
- Personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety Officer.
- The orientation and the tailgate safety meetings shall include a discussion of emergency response, site communications and site hazards.

(GeoEngineers' Site workers shall complete this form, which should remain attached to the HASP and be filed with other project documentation). Please be advised that this site-specific HASP is intended for use by GeoEngineers employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this HASP. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by the company.

I hereby verify that a copy of the current HASP has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge an understanding of the safety procedures and protocol for my responsibilities on Site. I agree to comply with the required, specified safety regulations and procedures.

Print Name **Signature** **Date**

_____

_____

_____

FORM 2
SAFETY MEETING RECORD
QUIET COVE PROPERTY
FILE NO. 5147-024-07

Safety meetings should include a discussion of emergency response, site communications, site hazards and mitigation measures.

- Use in conjunction with the HASP and JHA to help identify hazards.

Date: _____ **Site Safety Officer (SSO):**_____

Topics: _____

Briefly describe what was discussed:

_____

_____

Attendees:

Print Name **Signature:**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

FORM 3
ACCIDENT/EXPOSURE REPORT FORM
QUIET COVE
FILE NO. 5147-024-07

To (Supervisor): _____ From (Employee): _____

Telephone (with area code): _____

Name of injured or ill employee: _____

Date of accident: Time of accident: Exact location of accident:

Narrative description of accident/exposure (circle one):

Medical attention given on site:

Nature of illness or injury and part of body involved: Lost Time? Yes ☐ No ☐

Probably Disability (check one):

Fatal	Lost work day with days away from work	Lost work day with days of restricted activity	No lost work day	First Aid only
☐	☐	☐	☐	☐

Corrective action taken by reporting unit and corrective action that remains to be taken (by whom and when):

Employee Signature: Date:

Name of Supervisor:

GeoEngineers