COMPLIANCE MONITORING PLAN

FOR THE

Tidewater Fuel Line Leak Site

Pasco, Washington

Washington Department of Ecology
Consent Decree No. 16-250951-11

Prepared for:

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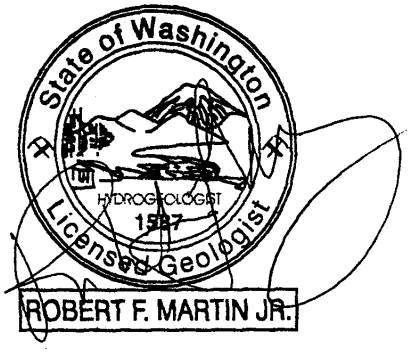
November 2017



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1.0 Introduction

This Compliance Monitoring Plan (CMP) has been prepared for the Tidewater Terminal Company (Tidewater) Fuel Line Leak Site (the Site) located in Pasco, Washington. This CMP describes the groundwater monitoring activities required under the Cleanup Action Plan (CAP) developed for the Site by the Washington Department of Ecology (Ecology). The CAP is provided as Exhibit B of the signed Consent Decree that was filed on November 22, 2015 (Ecology, 2016).

1.1 Statement of Work

As stated in the Consent Decree, the CAP sets cleanup standards and selects the cleanup action that meets the cleanup standards for the Site. The CAP indicates that the Ecology-selected remedy for the Site is monitored natural attenuation (MNA), coupled with passive bioventing and institutional controls (Alternative 1). As required by the Consent Decree and defined in the CAP, this CMP describes the monitoring locations, methods, frequency, analytical parameters, and reporting obligations required to ensure that the cleanup objectives established in the CAP are met. MNA, bioventing, and Institutional Controls (ICs) are described in detail in Section 1.3. Included as appendices to this CMP are the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP).

1.2 Site Description

The Site is located on an easement that crosses the former Chevron Pipe Line Company (CPL) Pasco Bulk Terminal (Pasco Terminal) Site located in Pasco, Washington. Tesoro Logistics Operations LLC (Tesoro) purchased the CPL Pasco Terminal site from Chevron in 2015. The Pasco Terminal is located southwest of the intersection of U.S. Highway 12 and Sacajawea Park Road, east of the City of Pasco in Franklin County, Washington (Figure 1). The 33-acre Pasco Terminal site is situated on the north bank of the Snake River (Lake Wallula), and is surrounded by unimproved land to the southwest, north, and northeast. Sacajawea Park Road crosses the northern portion of the Site, and a rail spur runs along the river bank.

The Pasco Terminal is an active facility that has been in operation since September 1950. It is used for bulk storage of refined fuel products, which are delivered through pipelines and by barge. Pipelines transfer the product between the terminal and barge facility. Petroleum products (currently diesel, gasoline, jet fuel) and ethanol are stored in 18 aboveground storage tanks. Tidewater (and its predecessors) own and operate pipelines that transfer products between the Pasco Terminal and the adjacent Tidewater Terminal, located approximately ¾-mile upstream of the Pasco Terminal. The Pasco Terminal Site and Tidewater site is shown on Figure 2.

Petroleum products have been released at various times from tanks, pipelines and other facilities within the formerly owned CPL Pasco Terminal. In July 2000, Tidewater reported a leak of approximately 41,000 gallons of unleaded gasoline that was released into the environment before

the leak could be repaired. The leak originated from one of Tidewater's fuel transfer lines at the site and was located approximately 60 feet west of Tank 19 (current location of well AR-1). Tidewater notified Ecology of the release and initiated emergency response and installed multiple monitoring and extraction wells at the site to characterize the extent of the release. Follow on activities performed under the Voluntary Cleanup program with Ecology included free product removal through vapor enhanced pumping, vapor extraction, and groundwater air sparging and vapor extraction until asymptotic recovery levels were achieved and post active remedial conditions indicated decreasing groundwater concentrations and contracting plume size. CPL and Tidewater had conducted soil and groundwater investigations and performed remedial activities to address these historical releases, which are described in the Remedial Investigation/Feasibility (RI/FS) Report, dated September 29, 2011. Additional characterization work was conducted by Tesoro and is included for reference in Appendix C.

At the time of the RI/FS, the site encompassed the CPL Pasco Terminal and the Tidewater Pipeline Fuel Leak Site. In July 2015 Ecology made the decision to separate the site into two Sites: the area associated with the Tidewater Fuel Pipeline Leak Site and the Tesoro (former CPL) release site (Ecology, 2016). This CMP addresses only monitoring activities related to the Tidewater Site located within the Tesoro Pasco Terminal.

Indicator substances identified in the CAP for the Tidewater Site include benzene, toluene, ethylbenzene, total xylenes (BTEX), and gasoline, diesel, and heavy oil fractions of Total Petroleum Hydrocarbons (TPH).

1.3 Compliance Monitoring Requirements

This CMP meets the requirements of the Model Toxics Control Act (MTCA), and other regulatory guidance documents, such as Ecology's *Guidance on Remediation of Petroleum-Contaminated Ground Water by Natural Attenuation* (Ecology, July 2005). As defined by MTCA [WAC 173-340-410], compliance monitoring is divided into three categories:

- Protection Monitoring;
- Performance Monitoring; and
- Confirmational Monitoring.

The historical release resulted in localized degradation of groundwater quality within the unconfined groundwater beneath the Site. Groundwater monitoring through December 2010 has demonstrated that previous remedial activities and ongoing natural attenuation processes have reduced indicator substance concentrations across the Site, and that the indicator substances are not detected in the monitor wells closest to the river. Indicator substance concentrations remain above the established cleanup levels (Section 2.2.1) in a few monitoring wells at the Tidewater site.

Current institutional controls are already in place at the site, including physical barriers (fencing) to access. The property owner adheres to a strict Permit to Work policy, which requires issuance of a Safe Work Permit whenever work is performed, and safety precautions to be taken. Access is controlled through the property owner's onsite office.

Bioventing was included as part of historic active remediation, and has continued as part of the ongoing remedial action. Wells MW-2, MW-3, and MW-4 wellheads have been fitted with vent caps and filters to provide passive atmosphere into the subsurface. These were originally initiated under active vapor extraction operations to "short circuit" the lateral extent of the vapor extraction/negative pressure influence from extending outside the Tidewater release area and potentially influencing other release areas on the site. These well heads have been maintained as part of passive bioventing and is proposed to continue under the compliance monitoring.

As part of ongoing compliance monitoring, the constituents of concern and MNA parameters will be tested and evaluated for confirmation that attenuation processes are active at the site. If conditions at the site indicate that MMA is no longer active (or greatly reduced), a re-evaluation of the chosen site remedy will be performed. Post active remediation monitoring has been completed at the site and demonstrated ongoing reduction in groundwater concentrations.

The rest of this CMP describes the performance and confirmational monitoring program for the Site.

2.0 Summary of Cleanup Action

2.1 Cleanup Action Objectives

The primary goal of the cleanup action is to protect human health and the environment by preventing or minimizing the potential release of a hazardous substance, and by reducing the potential for direct contact and transport of contaminants to the environment. Prior remedial activities conducted by Tidewater have reduced the concentrations of indicator substances in soil and groundwater near the historical release area. Based on the findings of the 2011 RI, indicator substance concentrations in groundwater are above the cleanup criteria in only a few limited areas. More significantly, the indicator substances do not appear to be migrating, and time-series data show overall declining trends in indicator substance concentrations.

The only potentially significant source of risk at the Site is from the discharge of indicator substance-affected groundwater to the Snake River. The RI has empirically demonstrated that indicator substance-affected groundwater does not reach or pose a threat to the Snake River; therefore, groundwater is the only medium of concern at the Site. The cleanup action objective is to remove or decontaminate the indicator substances in groundwater in the few areas where these indicator substances are still present above cleanup levels. There is no separate remedial action objective for soil, because the potential transfer of indicator substances from soil to ground water will be addressed through the remedial objective for groundwater. Cleanup objectives for surface water and sediments also are addressed through the cleanup objective for groundwater, because indicator substances from the historical releases in the tank area could only reach these media via migration of affected groundwater.

MNA with passive bioventing and institutional controls is the remedy Ecology has selected for cleanup of the remaining indicator substances in groundwater at the Site (Section 7.0 of the CAP, Ecology 2016).

2.2 MTCA Cleanup Standards

One of the requirements of the MTCA cleanup regulation [WAC 173-340] is to establish cleanup standards for individual sites. The two components of the cleanup standards are (1) cleanup levels, and (2) point of compliance (POC).

2.2.1 Cleanup Levels

The cleanup levels for the Site indicator substances were developed considering the existing Site conditions, known exposure pathways, anticipated receptors for the current Site activities, nearby land uses, and current and potential future beneficial uses of groundwater. The primary beneficial use of the groundwater beneath the Site is as a drinking water source. The Site indicator substances are petroleum hydrocarbons, such as gasoline-, diesel- and heavy oil-range organics (reported as NWTPH-Gx, NWTPH-Dx, and NWTPH-Rx, respectively) and fuel

chemical constituents (BTEX). Cleanup levels for these indicator substances are listed in Table 1. The process used to develop the cleanup levels is described in the CAP.

2.2.2 Points of Compliance

Points of Compliance (POCs) are designated at on-site locations where cleanup levels are to be met. Once the cleanup levels have been attained at the POCs, a site is no longer considered a threat to human health and the environment.

The standard POC for groundwater is established throughout a site from the uppermost level of the saturated zone extending vertically to the lowest depth which could potentially be affected by the site. For the Site, the standard POC is the unconfined groundwater located in the sand and gravel deposits beneath the facility. Many of the existing groundwater monitor wells within the Tidewater site are located in the areas of degraded groundwater, and provide an adequate assessment of the groundwater and indicator substances at the POC.

3.0 Compliance Monitoring Program

Tidewater will conduct compliance monitoring until the monitoring results demonstrate that the indicator substances concentrations are below the required cleanup levels, and the Site has achieved the cleanup standards. Compliance monitoring includes both performance and confirmational monitoring. Performance monitoring will begin in Spring 2018 as the Consent Decree has been signed and is in effect. Performance monitoring for the Tidewater site will be conducted until the Site indicator substances are no longer detected above the cleanup levels established in the CAP for the Tidewater monitor well network. At that time, confirmational monitoring will begin, and will continue until the cleanup standards are met.

3.1 Monitoring Objectives

The goal of compliance monitoring is to monitor the effectiveness of natural attenuation as the selected cleanup action for the Site. Specific objectives of the CMP are to:

- Document groundwater flow patterns, including changes that might adversely impact effectiveness of the natural attenuation remedy;
- Identify the wells to be sampled and analyses to be performed to demonstrate compliance with the cleanup standards;
- Establish a monitoring frequency that ensures that human health and the environment continue to be protected during performance and confirmational monitoring periods; and
- Provide periodic reports to demonstrate progress toward achieving Site cleanup standards.

The compliance monitoring activities performed by Tidewater will be conducted in accordance with this CMP, including the SAP and QAPP presented in Appendices A and B, respectively. Together, use of the SAP and QAPP are intended to promote:

- Consistent field procedures;
- Collection of representative samples;
- Proper calibration of field equipment to obtain accurate field measurements;
- Minimization of cross-contamination and the introduction of artificial contaminants;
- Accurate documentation of field observations, sampling procedures, and decontamination procedures;

- Consistent laboratory analytical procedures; and
- Collection of data that are accurate and defensible, and are of adequate technical quality to meet the data quality objectives for the Site.

Field activities will also be performed in accordance with a project-specific Health and Safety Plan (HSP).

3.2 Monitor Well Network

The compliance monitoring network consists of a subset of the existing monitor wells at the Site. The compliance monitor wells are identified in Table 2, and are shown on Figure 2. Groundwater samples will be collected for laboratory analysis from the wells listed in Table 2 during each performance or confirmational monitoring event. The compliance monitoring network includes six Tidewater monitor wells.

The compliance monitoring network includes one upgradient monitoring location (AR-11), three sentinel wells (MW-4, MW-6, and MW-8), and two interior plume source area well (AR-4 and AR-8). MW-8 is in an area of former free product but located up- and cross-gradient, with significant reductions in dissolved phase petroleum hydrocarbons. In response to improvements in the groundwater concentrations in well MW-8, this location may be replaced by MW-7, as the plume contracts. The other existing Tidewater monitoring wells will be retained for passive bioventing.

3.3 Monitoring Frequency

The most recent indicator substance concentrations in groundwater samples collected in 2010 and 2014 from Tidewater monitor wells show reduced concentrations from historical values and are non-detect or below MTCA Method A cleanup criteria in most site wells. Residual dissolved-phase petroleum hydrocarbons still remain on-site within the localized area that previously contained phase-separated hydrocarbons (PSH). However, PSH has been sufficiently removed and addressed at the Site based on the most recent analytical data. In addition, no petroleum hydrocarbons (TPH or BTEX) have been observed in the four downgradient monitor wells closest to the river for the Tidewater Site.

Given the availability of historical data, the overall declining trend in indicator substance concentrations, and because the low hydraulic gradients measured at the Site are not conducive to rapid transport of indicator substances in groundwater, annual performance monitoring will be conducted at the Site. After compliance with cleanup levels has been demonstrated for the Tidewater monitor well network through performance monitoring, four additional quarterly sampling events will be conducted to confirm that groundwater concentrations in all the wells in that network have met the cleanup levels under high- and low-level groundwater conditions. Compliance monitoring wells will be used as the monitoring network until cleanup criteria have

been achieved in all compliance monitoring wells (four subsequent sampling events without exceeding the cleanup levels in all wells)..

3.4 Monitoring Events

Each groundwater monitoring event will include determination of the hydraulic gradient and sampling of specific monitoring wells in accordance with the Consent Decree to assess the progress toward achieving the cleanup criteria. Applicable procedures for these activities are described in the SAP (Appendix A) and QAPP (Appendix B).

3.4.1 Depth to Groundwater and Detection of Phase-Separated Hydrocarbons

The compliance monitoring program will include the measurement of the depth to water and total well depth of the Site monitor well network. The total well depth will be used to assess whether sediment is accumulating in the well. The depth to water measurements will be used to construct a potentiometric surface map for each sampling event.

Collection of groundwater samples will not be performed from monitor wells that have measureable phase-separated hydrocarbons (PSH). Tidewater monitoring wells that have shown historical presence of PSH will be measured with an Interface Probe capable of detecting the presence of PSH. A disposable translucent bailer may also be used to confirm the presence and thickness of PSH in a well. If PSH is detected, the depth and thickness of PSH will be recorded on the field sheet or field notebook and the well will not be sampled.

3.4.2 Sample Collection

After measuring depth to water and confirming that PSH is not present in the monitoring well, low-flow sampling techniques will be implemented to collect representative groundwater samples from monitor wells in accordance with EPA field parameter stabilization criteria (USEPA, 2002). During monitoring well purging activities prior to sampling, field water quality parameters will be measured and recorded to determine when water removed from a well is representative of in-situ groundwater conditions and ready for sampling. The field parameters to be measured include temperature, pH, specific conductance, dissolved oxygen (DO), oxidation-reduction potential (ORP), and turbidity. Groundwater sampling procedures are discussed in detail in the Sampling and Analysis Plan (SAP).

3.4.3 Analytical Parameters

Indicator substances for the compliance monitoring program are benzene, toluene, ethylbenzene, total xylenes (BTEX), gasoline range-hydrocarbons (NWTPH-Gx), diesel range-hydrocarbons (NWTPH-Dx), and heavy oil-range hydrocarbons (NWTPH-Rx). Table A-2 in the SAP lists the analytical parameters, methods, and estimated number of groundwater samples to be collected during the compliance monitoring period. Analytical methods and data quality objectives are

described in the Quality Assurance Project Plan (QAPP) in Appendix B. All groundwater samples will be analyzed by an Ecology-accredited laboratory.

Secondary geochemical indicator parameters will also be analyzed to demonstrate that active biodegradation is continuing. The secondary geochemical indicator parameters will include ferrous iron, manganese, and sulfate. These secondary geochemical indicator parameters will be used in conjunction with DO and pH field reading values collected at the end of well purging to enable assessment of oxidation-reduction conditions and the status of natural attenuation at the Site.

3.4.4 Quality Control/Quality Assurance

Quality control (QC) and quality assurance (QA) processes employed during compliance monitoring will involve collection of field quality control samples, calibration of field equipment, analysis of internal laboratory QC samples, and external data quality review of the laboratory analytical results. The types and numbers of field QC samples are described in the SAP (Appendix A). QC requirements for the laboratory analytical methods and external QA reviews are described in the QAPP (Appendix B).

3.4.5 Waste Management

Compliance monitoring at this Site will involve collection of groundwater samples from selected existing Tidewater monitor wells. The types of wastes likely to be generated during compliance monitoring are described in the SAP, and include:

- Purge water and water from decontamination of non-dedicated equipment;
- Used nitrile gloves;
- Used tubing from low-flow sampling; and
- Miscellaneous solid waste (paper towels, protective plastic wrappers, etc.).

The compliance monitoring program will be conducted at an operating bulk fuel terminal. The facility has procedures in place for handling these types of materials, including water and solid waste that contain fuel hydrocarbon residues. The water generated during well gauging and sampling will be disposed of in the facility's permitted wastewater treatment system. Other trash will be disposed of in designated waste containers located on the Tidewater Terminal site, located approximately ¾ mile upstream from the Pasco Terminal. Therefore, a formal waste management plan is not required for this Site.

3.4.6 Health and Safety

CH2M will be responsible for the health and safety of its employees and subcontractors (if any) performing work under the CMP. CH2M will develop a project-specific HSP to assign

responsibilities, establish personal protection standards and mandatory safety procedures, and provide for contingencies that may arise while operations are being conducted at the Site.

The CH2M Field Team Lead will have a Transportation Worker Identification Card (TWIC) as required by law to work unescorted within the Tesoro facility when working on the Tidewater Site. Since the Tidewater site is located within the controlled perimeter of the Tesoro Pasco Terminal, CH2M field personnel will comply with all applicable Tesoro health and safety and work permit requirements, including air monitoring and approval of the use of any equipment that would be considered 'hot' by Tesoro (Power generators, equipment connected to portable batteries, etc.).

Before the start of work, CH2M will review the project-specific HSP, Tidewater safety requirements, Tesoro safety requirements, the SAP (Appendix A), and will perform a hazard assessment to ensure that all appropriate front-end safety planning is in place. Upon arrival for a sampling event, The CH2M field team will participate in a safety kickoff meetings with Tidewater and Tesoro representatives to review site-specific safety concerns and requirements. Tesoro requires all work at their facilities to be performed under a Safe Work Permit, which will be issued to field personnel before work begins each day. Morning tailgate safety meetings will also be held daily and documented in the field activity logs.

HSPs are considered 'living' documents in that they are constantly being updated as site conditions dictate, a draft HSP for the site has been included in Appendix D for Ecology's reference in the CMP. The final HSP will be submitted for Tidewaters review and approval prior to any work performed on the Tidewater site and will be updated as required by CH2M and Tidewater requirements. Creation of and updates to the HSP will be performed as needed, and will not require modification or review of the Consent Decree or CMP.

4.0 Reporting

Results of the compliance monitoring program will be compiled into summary reports that will be submitted in the annual Progress Report required by the Consent Decree. In addition, the water level and analytical data will be submitted online in a format compatible with Ecology's Environmental Information Management System, per Ecology Policy 840.

The compliance monitoring summary report will provide a brief evaluation of the progress of natural attenuation toward achieving the cleanup levels, including whether the dissolved-phase plume is stable, contracting, or moving in an unexpected direction; impacts (if any) to downgradient receptors; and verification that indicator substance concentrations in sentinel wells remain below cleanup levels.

The summary report will also include documentation of the following items:

- Changes, if any, to the compliance monitor well network;
- Tabulated water level measurements, elevations, and analytical results for historical sampling events and most recent round of sampling;
- Potentiometric surface maps and hydraulic gradient calculations;
- Field sampling records, including completed groundwater purge forms with field parameter measurements; and
- Laboratory analytical reports and the associated data usability reviews.

5.0 Plan Amendment

Changes in Site conditions may require modification of the CMP. Except for changes to the Health and Safety Plan, proposed modifications will be submitted to Ecology for approval prior to implementation. CMP modifications may include changes to the frequency or dates of scheduled sampling events, analytical methods, or the monitor well networks. If required by operating facility requirements, proposed modifications to the monitor well network may include replacement, relocation, or physical removal (plugging and abandonment) of one or more wells in the monitor well network. These types of changes will not require modification of the Consent Decree.

TABLES

Table 1
Groundwater Cleanup Levels
Tidewater Pipeline Fuel Leak Site
Pasco, Washington

CONSTITUENT	MAXIMUM CONCENTRATION (ug/L)	MTCA CLEANUP LEVEL [1] (ug/L)
Benzene	6,750	5
Ethylbenzene	1,500	400
Toluene	17,000	320
Xylenes	12,590	1,600
Gasoline	77,000,000	800
Diesel	1,165,000	500
Heavy Oil	5,900	500

[1] From Cleanup Action Plan Table 1.

Table 2
Compliance Monitor Wells and Sampling Frequency
Tidewater Pipeline Fuel Leak Site
Pasco, Washington

Monitor Well ID	Compliance Monitor Well	Water Level Well	Well Purpose
MW-1			Upgradient
MW-2			Sentinel
MW-3			Sidegradient
MW-4	X	X	Sentinel
MW-5		X	Sentinel
MW-6	X	X	Sentinel
MW-7		X	Sentinel
MW-8	X	X	Sentinel
AR-1		X	Source
AR-2			Missing
AR-3			Obstructed
AR-4	X	X	Source Area
AR-5			Source Area
AR-6			Sentinel
AR-7		X	Downgradient
AR-8	X	X	Downgradient
AR-9			Sidegradient
AR-10			Sidegradient
AR-11	X	X	Upgradient
AR-12		X	Source Area

Notes:

1. During the performance monitoring period, all compliance monitor wells will be sampled annually until the cleanup levels have been reached.
2. During the confirmational monitoring period, all compliance monitor wells will be sampled for four consecutive semiannual confirmation sampling events.
3. Other monitor wells may be sampled intermittently, based on evaluation of the analytical results from the compliance monitor wells.

FIGURES

Path: K:\ENV\ENV20\25015004\GIS\MXD\Land Use Map.mxd

Imagery: Bing Maps August through October 2010

Legend

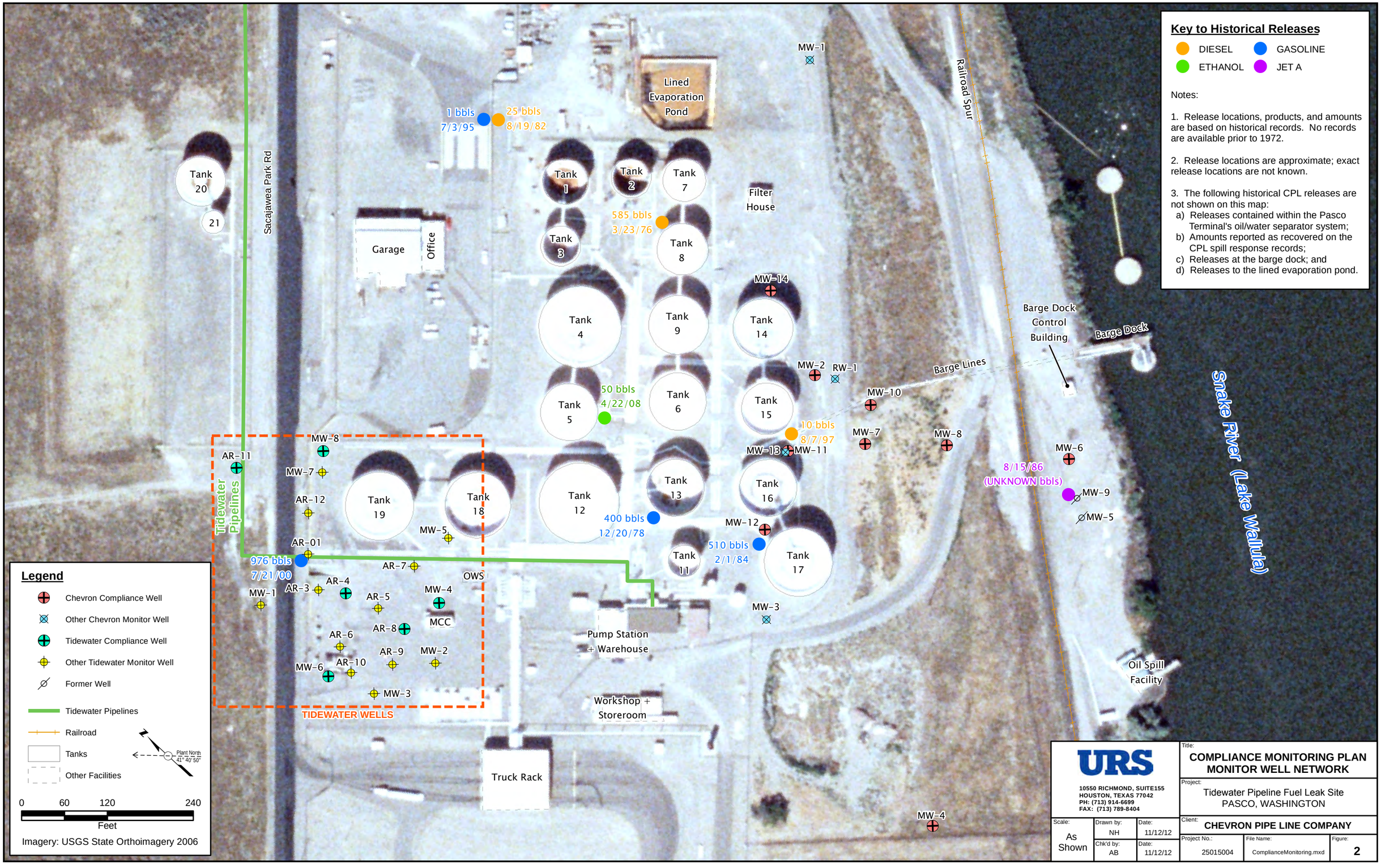
- SITE
- Railroad
- River Flow Direction

0 500 1,000 2,000
Feet

N W E S

URS
10550 RICHMOND, SUITE155
HOUSTON, TEXAS 77042
PH: (713) 914-6699
FAX: (713) 789-8404

Title:	**SITE VICINITY AND LAND USE MAP**		
Project:	CPL PASCO TERMINAL PASCO, WASHINGTON		
Client:	**CHEVRON PIPE LINE COMPANY**		
Scale: As Shown	Drawn by: NH	Date: 11/12/12	
	Chk'd by: AB	Date: 11/12/12	
Project No.: 25015004	File Name: Land Use Map.mxd	Figure: **1**	


Key to Historical Releases
DIESEL
GASOLINE
ETHANOL
JET A
Notes:
1. Release locations, products, and amounts are based on historical records. No records are available prior to 1972.
2. Release locations are approximate; exact release locations are not known.
3. The following historical CPL releases are not shown on this map:
a) Releases contained within the Pasco Terminal's oil/water separator system;
b) Amounts reported as recovered on the CPL spill response records;
c) Releases at the barge dock; and
d) Releases to the lined evaporation pond.
Legend
Chevron Compliance Well
Other Chevron Monitor Well
Tidewater Compliance Well
Other Tidewater Monitor Well
Former Well
Tidewater Pipelines
Railroad
Tanks
Other Facilities
Plant North 41° 40' 50"
0 60 120 240
Feet
Imagery: USGS State Orthoimagery 2006
1 bbls 7/3/95
25 bbls 8/19/82
585 bbls 3/23/76
50 bbls 4/22/08
10 bbls 8/7/97
400 bbls 12/20/78
510 bbls 2/1/84
8/15/86 (UNKNOWN bbls)
976 bbls 7/21/00
Lined Evaporation Pond
Sacajawea Park Rd
Railroad Spur
Barge Lines
Barge Dock
Barge Dock Control Building
Snake River (Lake Wallula)
Tidewater Pipelines
TIDEWATER WELLS
Garage
Office
Filter House
OWS
MCC
Pump Station + Warehouse
Workshop + Storeroom
Truck Rack
Oil Spill Facility
Tank 1
Tank 2
Tank 3
Tank 4
Tank 5
Tank 6
Tank 7
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MW-14
RW-1
AR-01
AR-3
AR-4
AR-5
AR-6
AR-7
AR-8
AR-9
AR-10
AR-11
AR-12
URS
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FAX: (713) 789-8404
Title: COMPLIANCE MONITORING PLAN MONITOR WELL NETWORK
Project: Tidewater Pipeline Fuel Leak Site PASCO, WASHINGTON
Client: CHEVRON PIPE LINE COMPANY
Scale: As Shown
Drawn by: NH
Date: 11/12/12
Chk'd by: AB
Date: 11/12/12
Project No.: 25015004
File Name: ComplianceMonitoring.mxd
Figure: 2

APPENDIX A
SAMPLING AND ANALYSIS PLAN

APPENDIX A

SAMPLING AND ANALYSIS PLAN

FOR THE

Tidewater Fuel Line Leak Site

Pasco, Washington

Washington Department of Ecology
Consent Decree No. 16-250951-11

Prepared for:

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November 2017

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Table A-3 – Water Quality Probe Quality Control Specifications

1.0 Introduction

This Sampling and Analysis Plan (SAP) presents a description of field sampling, field monitoring and laboratory analysis activities to be conducted during cleanup action pursuant to Consent Decree No. 16-250951-11 (Ecology, 2016) for the Tidewater Terminal Company, Inc., (Tidewater) Fuel Line Leak Site (the Site) in Pasco Washington. The Tidewater site is located within the secured perimeter of the Tesoro Pasco Terminal located along the Snake River (Figure A-1). The SAP has been developed for use during compliance monitoring, as required by the Cleanup Action Plan (CAP) prepared by the Washington Department of Ecology (Ecology). This SAP has been prepared by CH2M on behalf of Tidewater.

This SAP is intended to meet the requirements specified in the Washington Model Toxics Control Act (MTCA) [WAC 173-340-820], and other applicable regulatory guidance documents including the Guidance on Sampling and Data Analysis Methods (Ecology, 1995). Cross-references to the Compliance Monitoring Plan (CMP), and associated Quality Assurance Project Plan (QAPP), are used to reduce information overlap between this SAP and these other plans.

1.1 Background

Tesoro is the current operator of the Pasco Terminal which has been in operation since September 1950. Tesoro purchased the Pasco Terminal from Chevron Pipeline Compay (CPL) in 2015. The Pasco Terminal is used for bulk storage of refined fuel products. Currently, diesel, gasoline, jet fuel, and ethanol are stored in 18 aboveground storage tanks. Tidewater (and its predecessors) own and operate pipelines that transfer products between the Pasco Terminal and the adjacent Tidewater Terminal that is located approximately ¾-mile upstream.

Petroleum products have been released at various times from tanks, pipelines and other facilities within the Pasco Terminal. CPL, the previous owner of the Pasco Terminal, and Tidewater have conducted soil and groundwater investigations and performed remedial activities to address these historical releases. Constituents of concern determined from these investigations, and carried forward as indicator substances in the CAP, include benzene, toluene, ethylbenzene, total xylenes (BTEX), and gasoline, diesel and heavy oil fractions of Total Petroleum Hydrocarbons (TPH). The historical releases, results of investigations, and previous remedial activities are described in detail in the Final Remedial Investigation/Feasibility Study (RI/FS) Report (URS and CH2M, 2011).

1.2 Sampling and Analysis Objectives

Monitored natural attenuation (MNA), coupled with passive bioventing and institutional controls, is the Ecology-selected remedy for cleanup of the remaining COCs in groundwater at the Site (Ecology 2016). The primary goal of the CMP is to monitor the effectiveness of natural attenuation as the selected remedy. Specific objectives of the CMP are to:

1. Document groundwater flow patterns, including changes that might adversely impact effectiveness of the natural attenuation remedy;
2. Identify the wells to be sampled and analyses to be performed to demonstrate compliance with the cleanup standards;
3. Establish a monitoring frequency that ensures that human health and the environment continue to be protected during performance monitoring period; and
4. Provide periodic reports to demonstrate progress toward achieving Site cleanup standards.

This SAP has been prepared to ensure that the field and laboratory procedures utilized during implementation of the CMP are consistent with standard, generally accepted methods. This SAP provides a description of the specific procedures, activities, and protocols to be followed to meet the data collection and evaluation objectives. Field work performed on behalf Tidewater will be conducted in accordance with this SAP, which is intended to promote:

- Consistent field procedures;
- Collection of representative samples;
- Proper calibration of field equipment to obtain accurate field measurements;
- Minimization of cross-contamination, or the introduction of contaminants;
- Accurate documentation of field observations, sampling procedures, and decontamination procedures; and
- Collection of data that are accurate and defensible, and are of adequate technical quality to meet the data quality objectives.

1.3 Data Quality Objectives

Data and information collected during the compliance monitoring program will be compared to the groundwater cleanup levels established in the CAP. The primary objectives are to collect data on groundwater levels and groundwater quality to assess current Site conditions, and monitor the natural attenuation progress toward the cleanup standards. Data generated during the compliance monitoring program will require standard levels of quality assurance. Data will be of sufficient quality and quantity to support the assessment of current groundwater conditions, document the concentration of indicator substances in the groundwater, and confirm the effectiveness of MNA as the selected cleanup action for the Site. Field sampling and monitoring, laboratory analysis, and data validation will be designed to meet those needs.

Two types of data, with correspondingly different levels of data quality, will be generated as part of the performance monitoring field program:

- Validated laboratory analytical data; and
- Non-validated field measurements.

Data uses and data quality are summarized in Table B-2 presented in the QAPP (Appendix B in the CMP). Project-specific quality assurance objectives are presented in QAPP Table B-4.

Laboratory-analyzed groundwater samples, along with field and laboratory quality assurance (QA) samples, will be subject to data validation, as described in the QAPP. The overall QA objective for these samples is to provide analytical data of known quality in terms of precision, accuracy, completeness, representativeness, and comparability. The same data validation requirements will apply to any future soil samples collected for laboratory analysis.

Field calibration data will be maintained in field notebooks to document that field meter-derived data are collected from functional and properly calibrated equipment. As an additional validation step, field-collected data will also be compared to normally expected values or historical measurements.

1.4 Revisions

Data gaps may be identified from evaluation of the data collected during implementation of the MNA remedy. If the field activities are expanded to include installation of new or replacement monitor wells, soil sampling, or sampling of surface water or near-shore sediments, the SAP will be revised, as needed, to document the procedures that will be followed. Revisions will be submitted to Ecology for concurrence. However, revision of the SAP will not require modification of either the CMP or the Consent Decree.

1.5 Sampling Schedule

The annual groundwater monitoring events will occur annually and are anticipated to begin upon Ecology approval of the CMP in Spring 2017. Scheduling and preparations for the field work will be coordinated between CH2M and Tidewater and with Tesoro personnel at the Pasco Terminal due to access restrictions to the facility. The wells to be sampled and measured are included in the CMP are identified in Table A-1.

Performance groundwater monitoring will be conducted annually for the Site. After compliance with the cleanup levels has been demonstrated, four additional quarterly sampling events will be conducted to confirm that groundwater concentrations in all wells have met the cleanup levels. All existing Tidewater monitor wells included in the CMP network will be sampled during the confirmational sampling events. Other wells located on the Site may be sampled intermittently, based on evaluation of the analytical results from the compliance monitoring wells.

Compliance monitoring wells will be used as the monitoring network until cleanup criteria have been achieved in all compliance monitoring wells (four subsequent sampling events without exceeding the cleanup levels in all wells).

2.0 Sampling Methods and Quality Assurance

The following is a discussion of the methods proposed in the collection and analysis of groundwater samples during the compliance monitoring period. Details regarding the sampling locations for groundwater are shown on Figure A-2 and Table A-1.

2.1 Well Inspection, Redevelopment, and Repair

At the beginning of each groundwater monitoring event, each compliance monitor well will be inspected to determine the condition of each well. After inspection, total depths will be measured to determine if well screens are partially or fully blocked with sediment, and if any of the wells need to be redeveloped. Redevelopment, if needed, will be performed subsequent to the complete sampling of all compliance monitoring wells so as not to compromise the integrity of groundwater samples or prevent sampling of scheduled monitoring wells.

Depending on the nature of the repairs needed, repairs may be performed before or after sampling, or if specialized equipment is needed, prior to the next scheduled annual sampling event. Additional information is provided in Section 3.0.

2.2 Groundwater Measurements, Samples, and Parameters

Groundwater monitoring consists of measuring the total well depth and depth to the static water level, purging each well sufficiently to obtain a representative groundwater sample, measuring field water quality parameters (pH, temperature, specific conductance, dissolved oxygen [DO], turbidity, and oxidation-reduction potential [ORP]), recording observations for the collected sample (e.g., odor, appearance), and collecting water quality samples for field or laboratory analysis. Specific groundwater purging and sampling procedures are presented in Section 4.0 of the SAP. If the field measurements deviate significantly from expected values (e.g., pH or DO) or data from recent groundwater sampling events, the measurement(s) in question will be repeated.

Groundwater measurements will be collected from six Tidewater monitor wells, as described in the CMP. Table A-2 lists the analytical parameters and estimated number of groundwater samples to be collected and Section 5.0 of the QAPP lists the analytical parameters with analytical methods and MRLs. Groundwater samples will not be collected from monitor wells that have measureable Light Non-Aqueous Phase Liquid (LNAPL) on the water surface. Prior to groundwater level measurements, a disposable translucent bailer may be used to confirm the presence or absence of LNAPL in monitor wells that have historically contained LNAPL.

2.3 Field Quality Assurance/Quality Control

Three types of samples will be submitted to the laboratory as part of the field QA/QC program: field duplicates (FD), equipment blanks (EB), and matrix spike/matrix spike duplicates (MS/MSDs). These QA samples are described in the following sections. One FD and one MS/MSD QA/QC sample will be collected for each annual sampling event. One EB will be collected for each sampling event when non-dedicated purging equipment is used (submersible pumps). Laboratory QA/QC procedures are described in the QAPP (Appendix B). In addition, temperature blanks and trip blanks will be provided by the contract laboratory in sample coolers shipped to site with sample containers (trip blanks are required due to analysis of volatile organic compounds). Field duplicates will be collected from wells that are expected to contain measureable concentrations of indicator substances. The MS/MSD sample can be collected from any well as decided by the FTL and laboratory will be requested to run the MS/MSD specific to the site sample batch.

2.3.1 Field Duplicates

One field duplicate sample will be collected for each annual groundwater sampling event. The field duplicate sample will consist of an extra set of sample bottles and will be analyzed for the same constituents as the original samples. The field duplicate sample location will be determined in the field by the FTL from a well that has historically shown to have detectable concentrations of indicator substances. The duplicate will be assigned a different sample identification (ID) than the original sample. The duplicate sample ID will be such that it does not alert the laboratory personnel which sample the duplicate derived from. Both the original sample ID number and the duplicate sample ID number should be entered in the field notebook and field form at the time they are collected.

2.3.2 Equipment Blanks

Analysis of equipment blanks serves to check the effectiveness of decontamination procedures (Section 8.0). One equipment blank sample will be collected for each sampling event from the portable submersible pump that contacts groundwater samples from multiple sampling locations. After decontamination, laboratory-supplied deionized water will be used to rinse the equipment, and the rinsate will be collected into the appropriate sample bottles for analyses. The source of water used for equipment blank will be recorded in the field notebook. One equipment blank will be collected for each annual groundwater sampling event. Equipment blanks will be analyzed for the entire suite of analytical parameters.

2.3.3 MS/MSD (Collected for Laboratory QA/QC)

One MS/MSD sample will be collected during each annual groundwater sampling event. Extra sample bottles will be provided by the laboratory for the MS/MSD samples, which will be analyzed for all parameters. MS/MSD samples are typically collected at a minimum frequency of five percent (i.e., one for every 20 groundwater samples collected). MS/MSD samples will be labeled and identified on the

COC to alert the laboratory of this status. The appropriate sample volume necessary to perform the MS/MSD analyses will be confirmed with the specific laboratory performing the analyses.

2.3.4 Trip Blanks

Trip blank samples will be prepared for each cooler used for storage and transport of the samples. Analytical parameters for trip blanks will be the same as for samples, and will BTEX and NWTPH-Gx analysis.

2.3.5 Field Replicates

Field replicate (split) samples will be prepared only if the Ecology Project Manager indicates the agency wants to collect them. Analytical parameters for field replicates will be the same as for normal samples. No field replicates are planned at this time.

3.0 Groundwater Sampling Procedures

Groundwater sampling procedures can be separated into four main activities: (1) static water level measurement and LNAPL screening; (2) well purging; (3) measurement of field water quality parameters; and (4) sample collection. Each procedure is described in detail below.

3.1 Static Water Level Measurement and LNAPL Screening

Water level data will be used to evaluate groundwater flow directions and gradients. Water level measurements also will be used to identify the mid-point within the well screened interval based on the height of the water column for low-flow sampling, and will be the initial step in sampling each well. Water levels will be measured in all wells on the same day at the beginning of each sampling event, prior to any well purging or sampling for the Tidewater site. Prior to water level measurement, each well will be inspected for signs of damage, and the inspection results will be documented in the field note book or field record sheet. Upon removal of the well lid, air measurements will be collected from the headspace just above the well using a photo ionization detector (PID).

Each well to be gauged or sampled will be measured for static water level, total depth to the bottom of the well (TD), and if historically present, LNAPL thickness prior to well purging. The depth to the static water level (DTW) is the distance between a reference point (a marked point on the top edge of the inner well casing) and the static water level. The measurement will be performed using an electronic water level meter or oil/water interface meter. The meter's probe will be lowered into the well until it enters the water. The probe should be raised and lowered several times to ensure that the DTW is correct. The DTW, total well depth, and, if present, the thickness of phase separated hydrocarbons (PSH) or LNAPL will be measured to the nearest 0.01 foot, and recorded along with the date and time of measurement, in the field note book or field sheet. A disposable translucent bailer may also be used to confirm the presence or absence of LNAPL in each monitor well suspected of having LNAPL.

The water level measurement equipment will be decontaminated prior to initial use, between each well, and after completion of the water level measurement event, in accordance with the procedures described in Section 7.0.

3.2 Low-Flow Purging and Sampling

Groundwater will be purged and sampled using a submersible pump (e.g., 115-volt Grundfos Redi-Flo2, or equivalent) by low-flow techniques, in accordance with United States Environmental Protection Agency guidance document EPA/540/S-95/504 (Puls and Barcelona, 1996). Low-flow groundwater sampling is the process of purging and sampling wells at low flow rates from within the well screen zone to minimize purging and improve sample quality. Low-flow groundwater sampling has the advantage of producing a representative groundwater sample with far less total well purge water than is obtained from

conventional sampling of monitor wells, in which three well volumes are purged prior to sampling. Low-flow purging and sampling refers to the velocity with which water passes through the well screen, not necessarily to the flow rate of water discharged at the surface. Water-level drawdown provides the best indication of the stress imparted by a given flow rate for a given hydrological situation.

Groundwater sampling will be performed using a submersible pump and disposable polyethylene tubing set near the center of the water column within the well screen. Groundwater will typically be purged at a rate of 0.1 to 0.4 Liter per minute (L/min), but will be based on limitations of the formation and the purge flow-through cell. Continuous measurement of field water quality parameters (Section 4.3) will be used to assess when purged water has reached equilibrium. Stabilization of these parameters would indicate that the water is representative of in-situ groundwater conditions (the formation immediately surrounding the well screen near the pump intake).

3.3 Well Purging and Measurement of Field Water Quality Parameters

Prior to sampling, purge water will be removed from each well using a submersible pump and low-flow techniques. New or dedicated tubing connected to a portable submersible pump will be used to purge and sample each well. Field water quality parameters will be measured to determine when water removed from a well is representative of in-situ groundwater conditions. The field parameters to be measured will include temperature (T), pH, specific conductance (SC), dissolved oxygen (DO), turbidity, and oxidation-reduction potential (ORP). The field parameters will be measured using a multi-parameter water quality meter. All field measurements will be recorded on a field sampling form or field notebook. The field parameters will be measured at initiation of discharge and thereafter at three to five-minute intervals, until parameters stabilize. Stabilization will be achieved when three consecutive readings, taken at consistent three to five-minute intervals, are within the following limits:

- Temperature (±3%);
- pH (±0.1 units);
- Specific conductance (±3%);
- DO (±10%);
- Turbidity (±10% for values greater than 10 NTU); and
- ORP (±10 millivolts).

Field parameters will be measured using multi-parameter meters, such as Horiba U-52 water quality probe, or equivalent. The water quality probe will be calibrated prior to any use at the beginning of each day of use and subsequently, as needed, based on observations of the equipment performance and in accordance with manufacturer's recommendations. At a minimum, field meters with be calibrated at least daily during each sampling event. The calibration process will follow the control specifications described in Section 6.0 of the SAP.

Non-dedicated equipment used in the measurement of field parameters, such as probes, beakers, or the submersible pump, will be decontaminated in accordance with the procedures described in Section 8.0. Disposable cups may be utilized in place of beakers to avoid the need for decontamination.

3.4 Sample Collection

Samples will be collected immediately following completion of well purging, as determined by stabilization of the field water quality parameters. The same submersible pump and tubing used to purge a well will be used to collect the groundwater sample from that well. Field sampling personnel will don disposable nitrile gloves during purging and sampling activities, with new gloves worn at each sampling location. Groundwater will be carefully collected from the sample tubing from the submersible pump into laboratory-supplied sample containers. Samples will be collected in the following order, which has been established to assure that those parameters most likely to change rapidly when exposed to the atmosphere will be collected first:

- Volatile Organic Compounds (BTEX: benzene, toluene, ethylbenzene, and total xylenes)
- Total Petroleum Hydrocarbons - Gasoline
- Total Petroleum Hydrocarbons – Diesel

Geochemical indicator parameters will also be analyzed on some groundwater samples to demonstrate that active biodegradation and other natural attenuation processes are continuing. Only the samples from wells that had detected indicator substances during the previous sampling events will be analyzed for geochemical indicator parameters. These indicator parameters will be used in conjunction with DO and pH values measured during purging to evaluate oxidation-reduction (redox) conditions and the status of natural attenuation at the Site. The additional geochemical indicator parameters for MNA include:

- Manganese
- Sulfate
- Ferrous Iron
- Nitrate
- Methane

Samples collected for laboratory analysis will be placed in laboratory-supplied containers. For BTEX and NWTPH-Gx, 40-mL voas with Teflon septa will be used. The voas will be supplied by the laboratory with pre-measured amounts of hydrochloric acid (HCl) as a preservative. While filling the samples containers, sampling personnel will take care that no air bubbles are sealed in the 40-mL vials submitted for analysis of BTEX, and that voas are not overfilled resulting in acid preservation loss. The samples for NWTPH-Dx and NWTPH-Rx analysis will be poured into one liter amber glass bottles with Teflon lid and HCl preservative. Containers and preservatives for the additional geochemical indicator parameters will be as described in Table A-2.

Following collection, all groundwater samples will be placed in an ice-filled cooler. Each sample will be listed on a chain-of-custody form, which will be placed inside the cooler and accompany the samples to the laboratory. After all samples are collected, samples will be either shipped via overnight courier service or will be hand delivered the following day to the contracted laboratory.

4.0 Sample Identification and Documentation

4.1 Sample Identification

Each groundwater sample will be identified with a unique monitor well identification and sample date, as specified in the QAPP. Sample labels will be affixed to containers prior to sample collection. The following convention will be used to label the groundwater samples:

MWXX-yymm

Where: MWXX – monitor well ID (e.g., MW 01).

mmyy – The year and month is collected (e.g., 1705 = May 2017).

Field duplicates will be labeled as a fictitious ID number and sample time will be assigned to all field duplicate samples collected. To avoid missing analysis holding times, the time assigned to field duplicate samples will be the same or earlier than the collection time for the original sample.

Equipment blank samples will designated with "EB" followed by the day of sample collection. For example, an equipment blank sample collected on May 6, 2017 would be labeled: EB-1705. Trip blank samples will be designated in a similar manner, using the abbreviation "TB" instead of "EB". If more than one trip blank (or equipment blank) is submitted on the same day, then these samples will be labeled in sequences as follows: TB1-0517, TB2-0517, and so on.

MS/MSD samples will be collected as replicate samples from a monitor well. Triple volume will be collected and labeled appropriately, as discussed above. Samples for MS/MSD analysis will be clearly identified on the chain-of-custody, along with the well ID.

4.2 Sample Documentation

The following information will be documented in the field note book or on field sheets:

- Sampling team members;
- Equipment model number and calibration information for each meter used in the field;
- Monitor well purging data (including purge times, incremental and total volume removed during well purging, and water levels at the beginning and end of the purging process);
- Field water quality parameters (temperature, pH, DO, specific conductance, and turbidity) measured after each purge volume;
- Ferrous iron (field analysis);

- Management of purge water (i.e., total volume collected from each well, collection method, and where discharged into the on-site wastewater treatment system);
- Sampling data including sample ID, types of bottles/jars filled and analyses to be performed on each sample, method of collection (e.g., submersible pump), odor and visual description of the water, and date and time samples were collected; and
- Miscellaneous observations regarding well integrity, other nearby field activities and equipment problems/troubleshooting measures.

5.0 Sample Handling, Shipping, and Laboratory Receipt

Specific procedures for sample packaging and shipping will be followed to assure sample quality and minimize breakage during transport to the laboratory. Table A-2 summarizes sample containers, preservation, and holding times for each set of analyses.

5.1 Sample Preservation

Some groundwater samples require preservation to retard biological action, slow hydrolysis, and reduce sorption effects. Preservation methods generally consist of pH control through chemical addition (e.g., hydrochloric acid [HCl]), refrigeration (chill to 4 degrees Celsius), and protection from light (e.g., use of amber glass bottles). When a chemical preservative is needed for selected parameters, the laboratory will provide bottles with appropriate preservatives already added addition (e.g., HCl). Bottles prepared with preservative will be pre-labeled and identified as "preserved" in order to distinguish them from non-preserved bottles.

Samples will be placed in a cooler containing ice (refrigerated) immediately after collection and held under chain-of-custody until samples are ready for packaging and shipment. The ice will be in double-sealed plastic bags to contain the meltwater.

5.2 Sample Custody

Field personnel will maintain custody records for all samples collected as part of the performance monitoring field program. A chain-of-custody (COC) form will be completed for each shipping container, and the information will be consistent with the sample identification matrix.

The following information is to be included on the COC form:

- Client name and contact information;
- Name of sampler, company name, and contact information;
- Site name and location;
- Sample ID number;
- Date and time of collection;
- Type of sample;
- Type of container;
- Number of bottles per sample
- Analyses requested (if not submitted on a separate sample analysis request form);
- Inclusive dates of possession;
- Signature of sampler; and
- Signature of receiver(s).

In addition to the labels, seals, and COC form, other components of sample tracking include the field notebook and sample shipment receipt.

5.3 Sample Packaging

Samples to be shipped to the contract laboratory for analyses will be handled and packaged appropriately to prevent damage during transport, and to maintain complete COC records. Coolers will be provided by the contracted laboratory and will be used for shipping sample containers. Bubble wrap may be used to pack and cushion the sample containers in the cooler. The COC form will be sealed in a plastic bag and will be taped to the inside lid within the cooler. Two custody seals will be adhered on the cooler at the front and adjacent side of the container. The name and address of the receiving laboratory will be placed in a position clearly visible on the outside of the cooler, and the lid will be secured with strapping tape.

5.4 Sample Shipment

Samples will be shipped in accordance with Department of Transportation approved procedures. Samples will be transported to the laboratory by a member of the sampling team, or will be shipped via overnight courier (e.g., FedEx) to contracted Ecology-accredited laboratory.

5.5 Laboratory Receipt

When samples arrive at the laboratory, the personnel receiving the sample cooler will sign the COC and enter a laboratory number for the sample batch on the form. In addition, laboratory identification numbers are assigned to each sample and used by the laboratory for internal tracking of the samples. Samples will be assigned to particular analytical procedures either on the COC or on a sample analysis request form which may be submitted to the laboratory separate from the samples following review of the field data. The analytical methods which will be used are listed in Table A-2 and Section 5.0 of the QAPP lists the analytical parameters with analytical methods and MRLs. Both the laboratory batch number and sample numbers assigned in the field will be cited when analyses are requested. The laboratory will sign the COC and laboratory request forms and send a carbon copy to the CH2M Project Manager for placement in the master job file.

Damaged sample containers, sample labeling discrepancies between sample container labels and COC forms, and analytical request discrepancies will be noted on the COC form or laboratory sample receipt checklist, and the QA/QC Manager will be notified for problem identification and resolution.

6.0 Calibration of Field Equipment

The following field equipment will be used to support the groundwater sampling program:

- Electronic water-level meter and/or oil/water interface probe,
- Multi-parameter water quality meter (Horiba U-22 or U-52, or equivalent meters) capable of measuring temperature, pH, specific conductance, DO, turbidity, and ORP, and
- Multi-Rae Photo-ionization Detector (PID) capable of monitoring lower explosive level (LEL), oxygen, volatile organic compounds (VOCs), and carbon monoxide (CO), as required by Tesoro for work within the Pasco Terminal.

Calibration will be performed prior to each sampling event per the manufacturer's specifications. Recalibration will be performed, as needed, if inconsistent readings or unexpected readings are obtained. Quality control specifications associated with field measurements are summarized in Table A-3. This shows control parameters to be assessed, control limits, and the corrective actions to be implemented if the control limits are exceeded.

7.0 Decontamination of Sampling Equipment

All non-dedicated field equipment that comes into contact with groundwater (e.g., field meters, probes, and submersible pumps) will be washed in an Alconox or Liquinox cleaning solution, and double-rinsed with laboratory-supplied deionized water prior to use at each well location, and at the end of each sampling event. Water used for decontamination of non-dedicated equipment will be collected, containerized, and disposed of in the Pasco Terminal wastewater treatment system. Equipment blanks will be collected as described in Section 2.3.2 to document the effectiveness of the decontamination process.

The sample containers for all groundwater samples are provided by the contract laboratory for each sampling event and are discarded after analysis.

8.0 Disposal of Investigation Derived Waste

Purge water and water used for decontamination of non-dedicated equipment will be placed temporarily into five-gallon buckets (for measurement purposes), and will placed in the holding located tank located on the Tidewater site for Tidewater to reclamation/disposal as part of their plant activities. With the use of low-flow sampling techniques, the estimated purge volume will be approximately 1 to 2 gallons per well. Well re-development water, if performed, and water used to decontaminate the non-dedicated sampling equipment will be managed the same way.

Disposable personal protective equipment (PPE) will consist primarily of used nitrile gloves. Miscellaneous solid wastes generated during groundwater monitoring may consist of tubing, paper towels, plastic wrappers, aluminum cans, plastic cups, and other similar materials. Total volume is expected to be one large plastic bag per day, which will be disposed of in Tidewater-designated waste containers at the Tidewater Terminal.

If sediment is generated from existing monitor wells during redevelopment activities it will be containerized in 55-gallon steel drums and labeled with the name of the Site, monitor well number, and date of collection. The drums will be temporarily staged on-site prior to disposal by Tidewater. Disposal of the sediment will be arranged by Tidewater at an approved waste disposal facility.

9.0 References

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Ecology, 2016. State of Washington, Department of Ecology v. Tidewater Terminal Company, Inc., Consent Decree No. 16-250951-11. November 22, 2016.

FIGURE

Path: K:\ENV\ENV20\25015004\GIS\MXD\Land Use Map.mxd

Imagery: Bing Maps August through October 2010

Legend

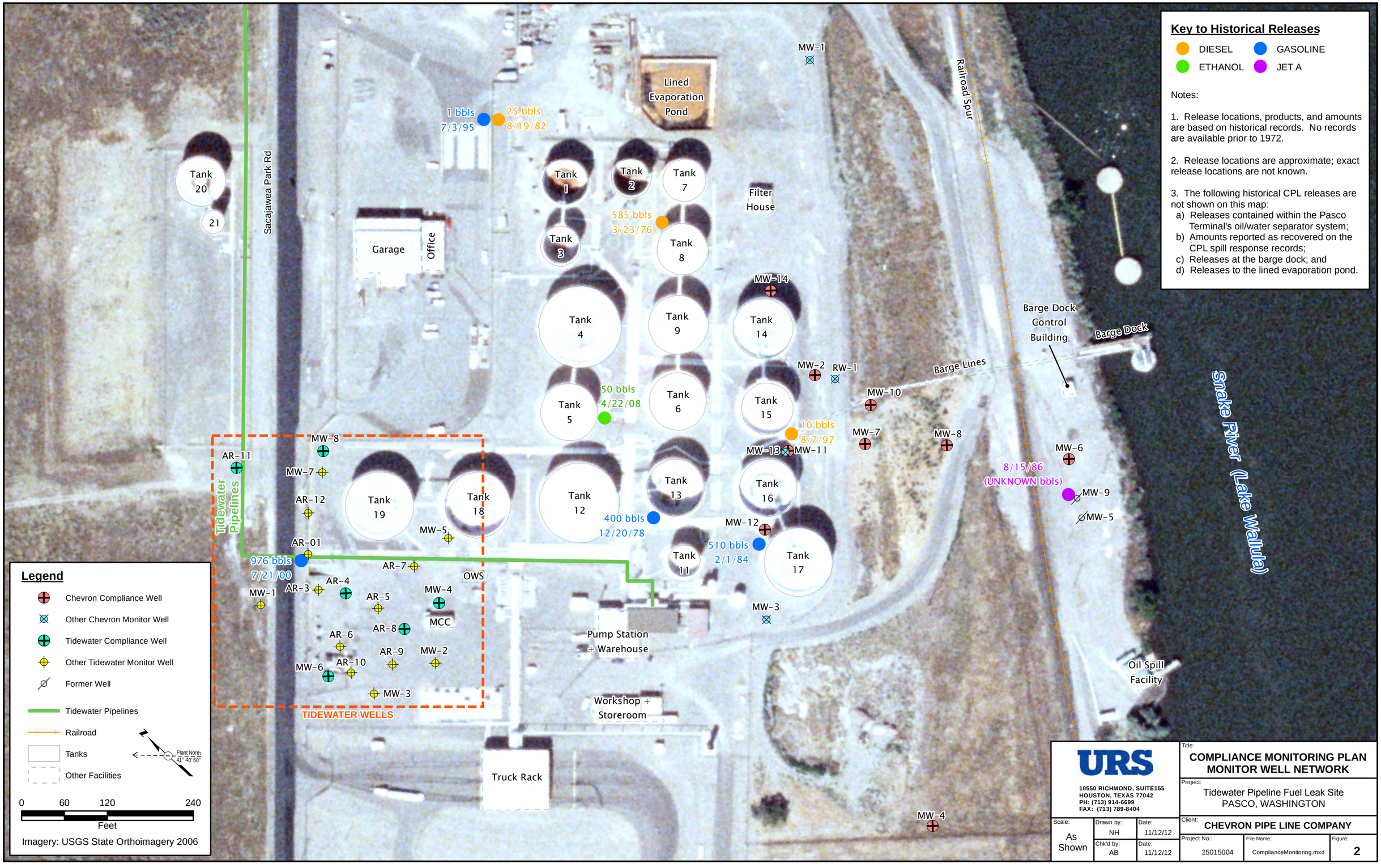
- SITE
- Railroad
- River Flow Direction

0 500 1,000 2,000
Feet

N W E S

URS
10550 RICHMOND, SUITE155
HOUSTON, TEXAS 77042
PH: (713) 914-6699
FAX: (713) 789-8404

Title:	**SITE VICINITY AND LAND USE MAP**		
Project:	CPL PASCO TERMINAL PASCO, WASHINGTON		
Client:	**CHEVRON PIPE LINE COMPANY**		
Scale: As Shown	Drawn by: NH	Date: 11/12/12	
	Chk'd by: AB	Date: 11/12/12	
Project No.: 25015004	File Name: Land Use Map.mxd	Figure: **1**	


Key to Historical Releases
DIESEL
GASOLINE
ETHANOL
JET A
Notes:
1. Release locations, products, and amounts are based on historical records. No records are available prior to 1972.
2. Release locations are approximate; exact release locations are not known.
3. The following historical CPL releases are not shown on this map:
a) Releases contained within the Pasco Terminal's oil/water separator system;
b) Amounts reported as recovered on the CPL spill response records;
c) Releases at the barge dock; and
d) Releases to the lined evaporation pond.
Legend
Chevron Compliance Well
Other Chevron Monitor Well
Tidewater Compliance Well
Other Tidewater Monitor Well
Former Well
Tidewater Pipelines
Railroad
Tanks
Other Facilities
Plant North 41° 40' 50"
0 60 120 240
Feet
Imagery: USGS State Orthoimagery 2006
1 bbls 7/3/95
25 bbls 8/19/82
585 bbls 3/23/76
50 bbls 4/22/08
10 bbls 8/7/97
400 bbls 12/20/78
510 bbls 2/1/84
8/15/86 (UNKNOWN bbls)
976 bbls 7/21/00
Lined Evaporation Pond
Sacajawea Park Rd
Railroad Spur
Barge Lines
Barge Dock
Barge Dock Control Building
Snake River (Lake Wallula)
Tidewater Pipelines
TIDEWATER WELLS
Garage
Office
Filter House
OWS
MCC
Pump Station + Warehouse
Workshop + Storeroom
Truck Rack
Oil Spill Facility
Tank 1
Tank 2
Tank 3
Tank 4
Tank 5
Tank 6
Tank 7
Tank 8
Tank 9
Tank 11
Tank 12
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Tank 16
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Tank 19
Tank 20
21
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
RW-1
AR-01
AR-3
AR-4
AR-5
AR-6
AR-7
AR-8
AR-9
AR-10
AR-11
AR-12
URS
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Title: COMPLIANCE MONITORING PLAN MONITOR WELL NETWORK
Project: Tidewater Pipeline Fuel Leak Site PASCO, WASHINGTON
Client: CHEVRON PIPE LINE COMPANY
Scale: As Shown
Drawn by: NH
Date: 11/12/12
Chk'd by: AB
Date: 11/12/12
Project No.: 25015004
File Name: ComplianceMonitoring.mxd
Figure: 2

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Table A1
Tidewater CMP Monitoring Well Network
Tidewater Pipeline Fuel Leak Site
Pasco, Washington

Monitor Well ID	Compliance Monitor Well	Water Level Well	Well Purpose
MW-1			Upgradient
MW-2			Sentinel
MW-3			Sidegradient
MW-4	X	X	Sentinel
MW-5		X	Sentinel
MW-6	X	X	Sentinel
MW-7		X	Sentinel
MW-8	X	X	Sentinel
AR-1		X	Source
AR-2			Missing
AR-3			Obstructed
AR-4	X	X	Source Area
AR-5			Source Area
AR-6			Sentinel
AR-7		X	Downgradient
AR-8	X	X	Downgradient
AR-9			Sidegradient
AR-10			Sidegradient
AR-11	X	X	Upgradient
AR-12		X	Source Area

Notes:

1. During the performance monitoring period, all compliance monitor wells will be sampled annually until the cleanup levels have been reached.
2. During the confirmational monitoring period, all compliance monitor wells will be sampled for four consecutive semiannual confirmation sampling events.
3. Other monitor wells may be sampled intermittently, based on evaluation of the analytical results from the compliance monitor wells.

Table A-2
Analytical Parameters, Methods, Containers, Preservatives, and Holding Times for Groundwater Samples
Tidewater Fuel Line Leak Site
Pasco, Washington

Parameter	Analytical Method	Container	Preservative	Maximum Holding Time	Number of Samples Collected
Volatiles Benzene Toluene Ethylbenzene Xylenes (total)	SW-846 8260B [1]	40 mL VOA w/ Teflon septa	HCl to pH<2, no headspace	14 days	6 wells +1 Duplicate + 1 MS/MSD +1 Equipment Blank
Gasoline Range Total Petroleum Hydrocarbons (TPH-Gasoline)	NWTPH-Gx [2]	40 mL VOA w/ Teflon septa	HCl to pH<2, no headspace	14 days	6 wells +1 Duplicate + 1 MS/MSD +1 Equipment Blank
Diesel Range Total Petroleum Hydrocarbons (TPH-Diesel)	NWTPH-Dx [2]	1 Liter amber glass w/ Teflon lid	HCl to pH<2	7 days until extraction; 40 days after extraction	6 wells +1 Duplicate + 1 MS/MSD +1 Equipment Blank
Heavy Oil Range Total Petroleum Hydrocarbons (TPH-Diesel)	NWTPH-Rx [2]	1 Liter amber glass w/ Teflon lid	HCl to pH<2	7 days until extraction; 40 days after extraction	6 wells +1 Duplicate + 1 MS/MSD +1 Equipment Blank
Sulfate	EPA 300.0 [3]	500 mL plastic w/ Teflon lid	None	28 days	Up to 6 wells +1 Duplicate

Table A-2
Analytical Parameters, Methods, Containers, Preservatives, and Holding Times for Groundwater Samples
Tidewater Fuel Line Leak Site
Pasco, Washington

Parameter	Analytical Method	Container	Preservative	Maximum Holding Time	Number of Samples Collected
Manganese	SW-846 6010B [1]	250 mL plastic w/ Teflon lid	HNO_3 to pH<2	180 days	Up to 6 wells +1 Duplicate
Nitrate	EPA 300.0 [3]	500 mL plastic w/ Teflon lid	None	2 days	6 wells +1 Duplicate
Methane	RSK-175	40 mL VOA w/ Teflon septa	None	14 days	6 wells +1 Duplicate
Ferrous Iron	SM3500	500 mL plastic w/ Teflon lid	None	24 hours	Up to 6 wells +1 Duplicate

Notes:
[1] U.S. EPA SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, 1986.
[2] Washington Department of Ecology, ECY 97-602, 1997.
[3] U.S. EPA, *Methods for the Chemical Analysis of Water and Wastes*, EPA 600/4-79-020, March 1983.

Table A-3

Water Quality Probe Quality Control Specifications

Tidewater Fuel Line Leak Site
Pasco, Washington

Analysis	Control Parameter	Control Limit	Corrective Action
YSI 6920, Horiba U-10 or U-22, or equivalent meters			
pH	At least daily calibration with two buffer solutions (pH = 4.0, 7.0, and/or 10.0)	±0.1 pH unit	Check with new buffers; if still out, repair meter. Repeat calibration check. If unable to calibrate, replace probe.
Temperature	None	±1.0° C	Correct problem; repeat measurement
Specific Conductance	At least daily calibration check of one or more standard solutions (KCl) selected based on expected range	±5% of standard	Check meter, standards and probe (clean probe); recalibrate
Dissolved Oxygen	Calibrate at least daily to assess variability, which is based on elevation and temperature. In summer, keep instrument in a cooler to prevent high range temperature variations. Range is 0 to 20 mg/L; ±0.3 mg/L.		
Turbidity	At least daily calibration check of standard solution	±5% of standard	Check meter and standards; clean probe, and recalibrate.
Oxidation-Reduction Potential (ORP)	Verify sensitivity at least daily	ORP should decrease when pH increases	If ORP increases, correct polarity of electrodes. If ORP still does not decrease, clean electrodes and repeat procedure.
	Calibrate at least daily. ORP varies greatly with temperature; calibrate using standard solution, and use chart of solution values per temperature. Range for groundwater is generally -400 mV to +800 mV.	±10 mV on two successive readings	Correct problem; recalibrate. If unable to calibrate, replace probe.

APPENDIX B
QUALITY ASSURANCE PROJECT PLAN

APPENDIX B

QUALITY ASSURANCE PROJECT PLAN

FOR THE

Tidewater Fuel Line Leak Site

Pasco, Washington

Washington Department of Ecology
Consent Decree No. 16-250951-11

Prepared for:

Tidewater Terminal Company, Inc.
6305 NE Old Lower River Road
Vancouver, WA 98660

Prepared by:

CH2M
999 W. Riverside Ave., Suite 500
Spokane, WA 99201

November 2017

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Table B-5 – Calibration Procedures Summary

Table B-6 – Quality Control Analyses and Frequencies

Approval Sheet

Name (Printed)	Signature	Date
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Reuben Greer CH2M Project Manager		
Robert Martin, LHG CH2M Senior Technical Advisor		
Jamie Beckett CH2M Quality Assurance Officer		
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Lab - TBD – Location	Person Address Location Telephone

	Email

Acronym List

bgs	below ground surface
CCV	Continuing calibration verification
CD	Consent Decree
CMP	Compliance Monitoring Plan
COCs	Constituents of Concern
CPL	Chevron Pipe Line Company
DCS	Detectability Check Standard
DQO	Data Quality Objectives
DQA	Data Quality Assessment
DUS	Data Usability Summary
FS	Feasibility Study
GC/MS	Gas chromatography/mass spectrometry
HASP	Health and Safety Plan
LCS(D)	Laboratory Control Sample (Duplicate)
LNAPL	Light non-aqueous phase liquids
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MQO	Measurement Quality Objective
MRL	Method Reporting Limit
MS(D)	Matrix spike (Duplicate)
MSL	mean sea level
MTCA	Model Toxics Control Act
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QAO	Quality Assurance Officer
QAPP	Quality Assurance Project Plan
QC	Quality Control
RI	Remedial Investigation
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SDL	Sample Detection Limit
SOP	Standard Operating Procedure
SSO	Site Safety Officer
TPH	Total Petroleum Hydrocarbon
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 Introduction

This Quality Assurance Project Plan (QAPP) describes the Quality Assurance/Quality Control (QA/QC) measures to be used for activities associated with implementation of the Compliance Monitoring Plan (CMP) for the Tidewater Terminal Company, Inc., (Tidewater) Tidewater Fuel Leak Site located in Pasco, Washington.

The CMP describes the groundwater monitoring activities required under the Cleanup Action Plan (CAP) developed for the Site by the Washington Department of Ecology (Ecology). The CAP is provided as Exhibit B of the signed Consent Decree that was filed on November 22, 2015 (Ecology, 2016). The CAP sets cleanup standards and selects the cleanup action that meets the cleanup standards for the Site. The CAP indicates that the Ecology-selected remedy for the Site is monitored natural attenuation (MNA), coupled with passive bioventing and institutional controls (Alternative 1).

This QAPP is intended to meet the CMP requirements specified in Consent Decree, the Model Toxics Control Act (MTCA) [WAC 173-340-350], and other applicable regulatory guidance documents including the Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies (Ecology, 2004).

1.1 Background and Project Description

The Tidewater Site is located on an easement that crosses the former Chevron Pipe Line Company (CPL) Pasco Bulk Terminal (Pasco Terminal) Site located in Pasco, Washington. Tesoro Logistics Operations LLC (Tesoro) purchased the CPL Pasco Terminal site from Chevron in 2015. The Pasco Terminal is located southwest of the intersection of U.S. Highway 12 and Sacajawea Park Road, east of the City of Pasco in Franklin County, Washington (Figure 1). The 33-acre Pasco Terminal site is situated on the north bank of the Snake River (Lake Wallula), and is surrounded by unimproved land to the southwest, north, and northeast. Sacajawea Park Road crosses the northern portion of the Site, and a rail spur runs along the river bank.

Tesoro is the current operator of the Pasco Terminal, which has been in operation since September 1950. The Pasco Terminal is used for bulk storage of refined fuel products, which are supplied to the terminal by barge or pipeline. Currently, diesel, gasoline, jet fuel, and ethanol are currently stored in 18 above ground storage tanks, and are dispensed through pipelines either to tanker trucks or to barges, which distribute the products downstream along the Columbia River. A barge loading/unloading facility and boathouse are located onsite at the shoreline of the Snake River/Lake Wallula. Tidewater (and its predecessors) own and operate pipelines that transfer products between the Pasco Terminal and the adjacent Tidewater Terminal.

Petroleum products have been released at various times from tanks, pipelines and other facilities within the Pasco Terminal. The site history, results of investigations, and previous remedial activities are documented in the Final Remedial Investigation/Feasibility Study (RI/FS) Report (URS, 2011). Indicator Substances as identified in the CAP include benzene, toluene, ethylbenzene, total xylenes (BTEX), gasoline, diesel, and heavy oil fractions of Total Petroleum Hydrocarbons (TPH).

1.2 Project Objectives

The goal of the CMP is to monitor the effectiveness of MNA as the selected cleanup action for the Site, and enable evaluation of the current and future risk to human health and the environment. Specific objectives of the CMP, and associated QAPP, are to:

- Document groundwater flow patterns, including changes that might adversely impact effectiveness of the natural attenuation remedy;
- Identify the wells to be sampled and analyses to be performed to demonstrate compliance with the cleanup standards;
- Establish a monitoring frequency that ensures that human health and the environment continue to be protected during the compliance monitoring period; and
- Provide periodic reports to demonstrate progress toward achieving Site cleanup standards.

The compliance monitoring program will utilize selected wells within the existing Tidewater monitor well network. Indicator substance concentrations will continue to be compared to MTCA cleanup levels established in the CAP to evaluate the effectiveness of the MNA remedy, as well as the progress toward achieving the cleanup standards.

1.3 Revisions

The focus of the QAPP is on groundwater monitoring, however, data gaps may be identified during implementation of this CMP. If the field activities are expanded, the QAPP will be revised, as needed, to document the procedures that will be followed. Revisions to the QAPP will not require modification of either the CMP or the Consent Decree.

1.4 Project Organization

Contact information is provided in the Distribution List for this QAPP. The following sections discuss the project organization and the distribution list are current as of January 2017. It should be noted that some designated individuals may change during the compliance monitoring period. Tidewater will notify Ecology for approval of significant personnel changes, per Consent Decree requirements. However, such changes will not require modification of the Consent Decree or CMP. An organization list is provided below. Roles and responsibilities for the project team members are summarized below in this section.

CH2M Project Manager	Reuben Greer 999 W. Riverside Ave., Suite 500 Spokane, WA 99201 509-464-7215 rgreer@ch2m.com
CH2M Senior Technical Advisor	Robert Martin, LHG 999 W. Riverside Ave., Suite 500 Spokane, WA 99201 509-464-7240 robert.martin@ch2m.com
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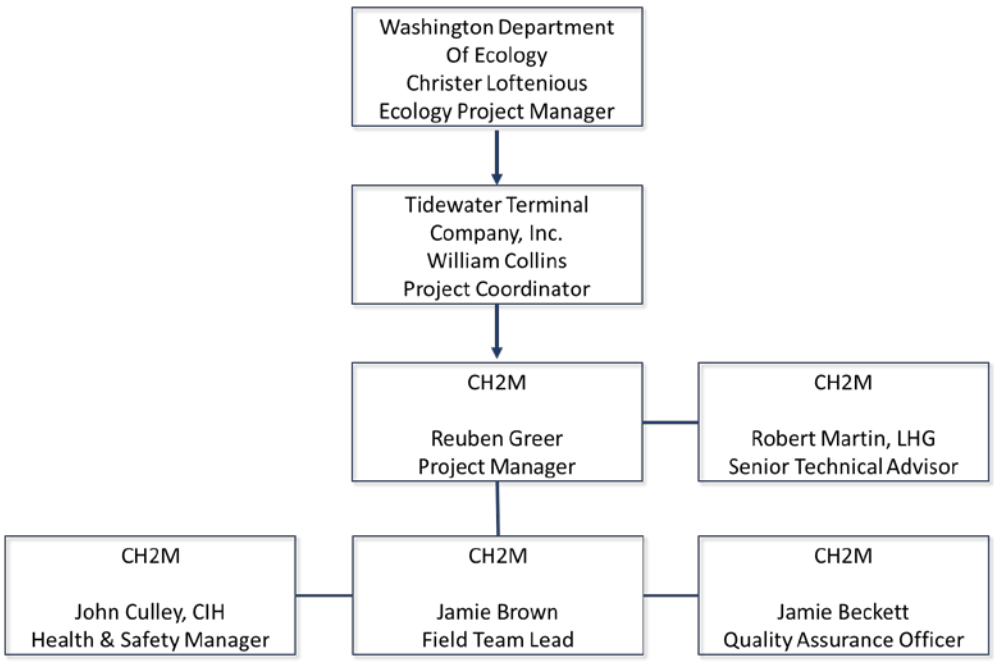

Project Manager

The Project Manager (PM) will be responsible for all aspects of the project. They will have responsibility for developing and implementing the CMP and associated tasks, including groundwater sampling, data management, and reporting. The PM will have overall responsibility for planning, scheduling, coordinating, and implementing the activities of their respective field teams, monitoring the project progress and quality, interfacing with Tidewater, and ensuring the timeliness of all project deliverables (e.g., periodic performance monitoring reports).

Senior Technical Advisor

The CH2M Senior Technical Advisor (STA) will act the technical resource of the project and will advise the project manager regarding site history, geology, and technology applications to meet the requirements of the CMP. In addition, the STA will assist the Project Manager in providing technical review of the annual groundwater monitoring report with staff working under his direct supervision and will provide final report as a Washington Licensed Hydrogeologist.

Field Team

The field team will perform the field tasks needed to comply with the objectives and requirements described in the CMP. The field team will consist of a Field Team Leader (FTL) who will also act as the CH2M Site Safety Officer (SSO). The Field Team Leader/SSO will be responsible for conducting and documenting the field work in accordance with the SAP and QAPP, and ensuring adherence to the safety requirements specified in the HSP. The FTL will also coordinate the on-site activities directly with Tidewater and Tesoro Pasco Terminal personnel, and communicate with the PM if any issues arise or significant deviations from the SAP are needed.

Quality Assurance Officers

The Quality Assurance Officer (QAO) is responsible for oversight of the quality of data produced by the analytical laboratory. The QAO will direct the quality review of laboratory analytical data generated for their respective investigation area. To ensure that appropriate analytical procedures and methods are used to meet the Data Quality Objectives (DQOs), the QAO will work closely with the PMs and analytical laboratory.

Health & Safety Manager

The field team will follow the requirements of the HSP, as well as any site-specific procedures at the Pasco Terminal. The Senior Health and Safety Manager (HSM) will review and approve the HSP for all

field activities performed for this project. The HSM will work directly with the PM and will be responsible for monitoring and verifying that the work is performed in accordance with the HSP.

1.5 QAPP Review Checklist

Ecology guidance describes 14 elements to be addressed in a QAPP (Ecology, 2004). Several of these elements are also covered in the Final RI/FS Report (URS & CH2M, 2011), or the project SAP. To avoid unnecessary repetition, cross-references to these other documents are provided in the QAPP. Table B-1 is a modified version of the QAPP checklist provided by Ecology (2004), which identifies the location of the required QAPP elements in the QAPP, SAP, or CMP.

2.0 Sample Process Design

During compliance monitoring, the field sampling events will planned and performed by CH2M in coordination with Tidewater, and will be conducted according to the Site SAP and QAPP. CH2M will also coordinate with Tesoro as the Tidewater site is located within the secured perimeter of the Pasco Terminal.

This QAPP has been prepared to ensure that consistent methods are used to obtain and evaluate data from the Site. The rationale for the selection and usage of the analytical parameters is described in detail in the CAP. Specific data quality objectives (DQOs) for each groundwater analytical parameter were selected through consideration of specific data uses, decisions, and regulatory requirements. Table B-2 lists project-specific analytical parameters and required detection limits. Appropriate method detection limits (MDLs) and method reporting limits (MRLs) are identified based on the MTCA cleanup levels established in the CAP, as well as analytical method limitations. For all groundwater parameters, the MRLs and MDLs are below the MTCA cleanup levels.

3.0 Quality Assurance Objectives

The quality assurance (QA) process formalizes the development and implementation of procedures to assure collection of data of known and appropriate quality to meet the stated CMP objectives. Data generated during the compliance monitoring field program will require standard levels of quality assurance. Data will be of sufficient quality and quantity to support the evaluation of current groundwater conditions, and the current extent of groundwater contamination.

Measurement Quality Objectives (MQOs) are qualitative and/or quantitative statements of the representativeness, comparability, precision (a measure of the random error), accuracy (a measure of systematic error), and completeness necessary for the data to serve the objectives of the project. During CMP implementation, field as well as laboratory data will be generated. Field data quality will be evaluated based on adherence to field procedures described in the SAP, including successful calibration of each field instrument and the stated accuracy and precision by the manufacturer. The quality of laboratory data will be evaluated based on the relative precision, accuracy, representativeness, completeness, and comparability of the data generated by each type of analysis. These terms are defined below:

3.1 Representativeness

Representativeness is a measure of how closely the measured results reflect the actual concentrations or distribution of the chemical compounds in the sampled medium (e.g., groundwater). Factors that affect representativeness include sampling plan design, sampling techniques, and sample handling protocols (e.g., storage, preservation, and transportation). Representativeness of the data collected will be ensured by using sampling procedures that represent the actual site conditions at the time of sampling. In addition, representative samples will also be ensured through following proper protocols for sample handling (storage, preservation, packaging, custody, and transportation), sample documentation, and laboratory sample handling and documentation procedures. Documentation will establish that protocols have been followed, and sample identification and integrity are assured.

3.2 Comparability

Comparability refers to the ability to compare the data from the project to other data. Recently collected groundwater data were evaluated for comparability during preparation of the Final RI/FS Report (URS & CH2M, 2011). Groundwater samples collected since at least 2004 were analyzed by Washington-accredited laboratories using standard EPA and/or state analytical methods.

Comparability of the newly acquired data will be achieved by using standard laboratory methods and procedures, which are defined or referenced in this document. Data comparability will be achieved through the use of consistent methods, consistent units, and well-defined detection limits. Tables B-2 lists

specific analysis parameters, applicable methods, and detection limits. MTCA cleanup levels established in the CAP are also listed in Table B-2.

3.3 Precision

Precision is a measure of the scatter in the data due to random error. For most environmental measurements, the major sources of random error are sampling and analytical procedures. Sampling and analytical precision is expressed as the relative percent difference (RPD). The formula for RPD calculations is provided in Table B-3. Precision measurements will be carried out in the laboratory at a minimum frequency of one per laboratory batch. Target quantitative precision objectives are listed as applicable in Table B-4.

3.4 Accuracy

Accuracy is a measure of the difference between the analytical result for a parameter and the true value due to systematic errors. Potential sources of systematic errors include sample collection, physical/chemical instability of samples, interference effects, calibration of the measurement system, and artificial contamination.

The accuracy of chemical test results is assessed by spiking samples with known standards and establishing the average recovery. In general, for organics, two types of recoveries are measured: matrix spike recoveries and surrogate spike recoveries. For a matrix spike, known amounts of standard compounds identical to the compounds present in the sample of interest are added to the sample. For a surrogate spike, the standards are chemically similar but not identical to the compounds in the fraction being analyzed. The purpose of the surrogate spike is to provide quality control on every sample by constantly monitoring for unusual matrix effects and gross sample processing errors. Two formulas for calculating percent recovery are provided in Table B-3. Accuracy measurements will be carried out at a minimum frequency of one per laboratory batch. Target quantitative accuracy objectives are listed as applicable in Table B-4.

3.5 Completeness

Completeness is a measure of the amount of usable data obtained from the analytical measurement system. Two formulas for completeness calculations are provided in Table B-3. The target completeness objective will be 90 percent; the actual completeness may vary depending on the intrinsic nature of the samples. The completeness of the data will be assessed during quality control reviews. Internal quality control checks, preventive maintenance, and corrective action will be implemented in order to maintain quality objectives, as described in the following sections of this QAPP.

4.0 Sample Custody and Documentation

A sample is physical evidence collected from the Site. Possession of samples will be traceable from the time the empty containers are sent from the laboratory to the field, to the time the samples are analyzed. This section discusses the chain-of-custody (COC) procedures and corrections to documentation.

4.1 Chain-of-Custody Procedures

COC procedures are used to maintain and document sample possession. The COC form is filled out by the sampler(s) in the field, and remains with the samples until analyses are completed. The principal documents used to identify samples and to document possessions are:

- COC records
- Air bills or shipping records (e.g., Federal Express), if applicable
- Field notebooks and/or field record sheets

A sample is under custody if one or more of the following criteria are met:

- It is in your possession;
- It is in your view, after being in your possession;
- It was in your possession and then you locked it up to prevent tampering; or
- It is in a designated secure area.

4.1.1 Field Custody, Transfer of Custody, and Shipping Procedures

All samples will be accompanied by a COC record. When transferring or shipping samples, the individual relinquishing and receiving them will sign, date, and note the time on the record. This record documents sample custody transfer from the sampler, often through another person, to the analyst at the laboratory. Field custody procedures, including sample packaging, custody, and shipping, are described in Section 5.0 of the SAP.

4.1.2 Laboratory Custody Procedures

Sample handling and custody requirements at the laboratory shall be as specified in the laboratory's Quality Assurance Manual and associated laboratory Standard Operating Procedures (SOPs). These requirements should be generally consistent with National Environmental Laboratory Accreditation Program (NELAP).

The laboratory sample custodian will accept custody of the shipped samples, sign the chain-of-custody form, record the date and time of receipt, verify that the samples received match those in the chain-of-custody records, and fill out a laboratory receipt checklist. The laboratory sample receipt checklist will explicitly state the condition of the sample containers, any evidence of damage, preservation (including temperature upon receipt), and the completeness of accompanying records.

After inspection, each sample will be logged in and assigned a unique laboratory sample ID. In addition, the following information will be entered in the laboratory information management system (LIMS) for each sample:

- Field sample ID
- Laboratory sample ID
- Date received
- Project name and number
- Collection date
- Sample type
- Analyses to be performed

After sample login is complete, a copy of the C-O-C record, with laboratory sample numbers and notations of any discrepancies will be sent to the QAO for the data to be entered into the project file. The Laboratory Project Manager will report any problems or discrepancies immediately to the appropriate QAO. The Laboratory Project Manager is responsible for faxing or e-mailing to the QAO a confirmation of sample receipt within one working day of sample receipt. The original copy of the COC form will be included with the final data package submitted to the QAO.

The laboratory sample custodian will distribute the samples to the appropriate analysts, who will be responsible for the care and custody of samples from the time they are received until the samples are exhausted or returned to the custodian. The data of sample analysis will be recorded on the laboratory report form. While in the laboratory, samples shall be stored in limited-access, temperature-controlled areas. Refrigerators, coolers, and freezers shall be monitored for temperature daily. The acceptance criteria for refrigerator and cooler temperatures shall be 0.5 to 6°C, and the acceptance criteria for freezer temperature shall be less than 0°C.

When sample analyses and necessary QA checks have been completed, the unused portion of the sample must be disposed of properly. All identifying stickers, data sheets, and laboratory records will be retained as part of the permanent documentation. Sample containers and remaining sample materials will be disposed of appropriately.

4.2 Corrections to Sample and Custody Documentation

All original data recorded in field notebooks, sample identification tags, and COC records will be written in waterproof ink. None of these documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document. If an error is made on a field or laboratory document, the original entry may be corrected by crossing a line through the error and entering the correct information. The erroneous information should not be obliterated. If possible, any error discovered in field or laboratory documentation should be corrected by the person who made the entry. All corrections must be initialed and dated. Following completion of the project, all field and laboratory documents must be retained for a minimum of ten years as required by CD Section XII.

5.0 Analytical Procedures and Detection Limits

5.1 Analytical Procedures

Analytical parameters and specific analytical methods for the groundwater samples are listed in Table B-2. Groundwater samples will be analyzed for the following COCs using the most current, approved versions of standard EPA and/or state analytical methods:

- SW-846 Method 8260B – Aromatic and Halogenated Volatiles by Gas Chromatography (GC) Using Photoionization and/or Electrolytic Conductivity Detectors;
- Northwest Test Method NWTPH-Gx - Gasoline-range total petroleum hydrocarbon (TPH); and
- Northwest Test Method NWTPH-Dx - Diesel- and heavy oil-range TPH.

In addition to the indicator substances, several parameters indicative of natural attenuation (MNA parameters) will be analyzed, including DO (field measurement), ferrous iron (field measurement), sulfate, ferrous iron, and manganese. These indicator parameters will be used in conjunction with pH values measured in the field to evaluate oxidation-reduction (redox) conditions and the status of biodegradation and other natural attenuation processes at the Site.

5.2 Method Detection and Reporting Limits

Analytical results will be compared to cleanup levels established in the CAP. Table B-2 lists the cleanup levels, method reporting limits (MRLs), and method detection limits (MDLs) for each indicator substance and MNA parameters. As shown in the table, the MRLs and MDLs for all indicator substances are lower than the cleanup levels. For reporting purposes, all detections between the MRL and MDL will be reported as "J" values.

The MDL is the defined in 40 CFR 136 as the minimum concentration of an analyte the laboratory would measure and report with 99% confidence that the analyte concentration is greater than zero. The MDL is determined for each analyte in a reagent matrix. The MDL can be determined using the procedures specified in 40 CFR Part 136, Appendix B (as amended), using reagent matrices that are both laboratory grade aqueous and solid materials.

The MRL is the lowest non-zero standard concentration in the laboratory's initial calibration curve based on the laboratory's SOPs for initial sample mass or volume and the final mass or volume after preparation. Therefore, the MRL is method-specific. Generally, the MRL is five to ten times higher than the MDL.

The sample detection limit (SDL) is the MDL adjusted to reflect sample-specific actions, such as dilution or change in aliquots for analysis and sample-specific characteristics. Non-detected results are reported as

less than the numeric value of the SDL. Concentrations greater than the SDL but less than the MRL are reported as estimated ("J") by the laboratory.

The target detection limits for the project will be MRLs as provided by contracted Ecology-accredited laboratory. Detection limits are established using pure standards; during measurement of an actual sample, SDLs may be elevated because of interference from other components in the matrix. This cannot be predicted ahead of time but will be reported if it occurs.

6.0 Calibration Procedures

6.1 Field Calibration Procedures

Calibration of field equipment is discussed in Section 6.0 of the SAP. If an equipment malfunction is suspected, the device will be removed from service, tagged to identify the suspected problem, and the appropriate personnel notified so that a recalibration can be performed, or a substitute piece of equipment can be obtained. Field equipment that fails calibration or becomes inoperable will be repaired and satisfactorily recalibrated prior to reuse. Equipment that cannot be repaired will be replaced.

Data collected with equipment that later fails recalibration will be evaluated. If the data appear to be affected, the results of the evaluation will be documented, and the PM will be notified. Suspected problems with the field equipment will be documented in the field note book.

To reduce the potential for equipment malfunction, preventative maintenance for field sampling and measurement equipment will be performed in accordance with the frequency and methods described in the manufacturer's operations manual or handbook for each piece of equipment. Any critical spare parts or sampling equipment disposables such as small tools, disposable bailers, sample containers and other small items should be inventoried by field personnel in order to prevent and/or minimize equipment downtime.

6.2 Laboratory Calibration Procedures

Laboratory instrumentation will meet applicable calibration requirements to ensure that the instrumentation is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable quantitative performance at the onset of analysis. Calibration during operation verifies acceptable performance of the instrument on a day-to-day basis. Tuning and instrument performance criteria will also be established, as appropriate, to ensure that instrument measurements may be interpreted correctly. Laboratory calibration procedures and frequencies are specified in the protocol for the specific analytical methods used. When there are no previously defined specifications, the calibration procedures will, at a minimum, be performed every six months, or after a significant change made to the equipment (e.g., new column). Laboratory calibration procedures are summarized in Table B-5.

The analytical laboratory will be responsible for preventive maintenance of the equipment used during analytical procedures. Instrument maintenance logbooks will be maintained in laboratories at all times. The logbooks, in general, will contain a schedule of maintenance as well as a complete history of past maintenance, both routine and non-routine. In addition, the laboratory will maintain current SOPs for review at all times.

7.0 Quality Control Procedures

Quality control (QC) procedures provide the means of evaluating and controlling the precision and accuracy of the analytical results. Careful adherence to established procedures for sample collection, preservation, and storage will minimize errors due to sampling and sample instability.

7.1 Field QC Procedures

Field sampling QC procedures will include the collection of field duplicates, equipment blanks, and trip blanks, as discussed in Section 2.3 of the SAP. Sufficient sample volume will be collected (triple the normal sample volume for aqueous samples) for at least one sample in each batch of 20 or fewer field samples so that matrix spike and matrix spike duplicate (MS/MSD) samples can be prepared in the laboratory for analysis. Table B-6 identifies the frequencies these types of field QC samples will be submitted to the laboratory. To minimize laboratory bias, field duplicates will be submitted as blind samples.

7.2 Laboratory Quality Control Procedures

The laboratory will be responsible for following the established QC procedures. The following minimum QC procedures will apply:

- Sample custody procedures as described in Section 4.0;
- Sample holding and preservation requirements as specified in SAP Table A-2;
- Analytical methodology (including sample preparation), detection limits, instrument calibrations, and standards per the methods listed in Table B-2;
- Data reduction and reporting per specific methods listed in Section 8.0;
- Internal quality control checks (laboratory control samples, method blanks, etc.) required by the Laboratory Quality Assurance Manual, SOPs, and analytical methods; and
- Laboratory performance and system audits as described in Section 9.0.

7.2.1 Types of Laboratory QC Samples

Laboratory QC samples are used to assess if analytical results are within quality control limits. The types of QC samples the laboratory will employ depend on the particular analytical methods. Each analytical method has required QC that must meet laboratory-developed acceptance limits in order for the data to be considered valid. In addition, as part of the laboratory's annual accreditation program, performance evaluation samples and method detection limit studies are conducted to evaluate the laboratory's capability of performing the method accurately and precisely. The following types of laboratory QC samples will be analyzed:

- Laboratory control samples (LCS);
- Matrix Spike/Matrix Spike Duplicates (MS/MSD);
- Surrogates;
- Internal Standards;
- Detectability Check Standard (DCS)
- Retention Time Windows
- Laboratory Blanks

For each batch of 20 or fewer samples, sufficient QC samples will be collected and analyzed to ensure that the appropriate QC measures described in the following sections will be attained. Laboratory QC samples will be handled, preserved, and documented in the exactly same manner as samples submitted from the field. The laboratory will run these QC samples at the frequency specified in Table B-6.

7.2.2 Laboratory QC Sample Control Criteria

Matrix spike, laboratory control sample, and surrogate recoveries associated with sample analyses are reviewed by the laboratory to assess whether the recoveries indicate an out-of-control situation and to determine if corrective action is necessary. The laboratory will document the findings of their QC review and the corrective actions performed in the case narrative for the analytical reports. Laboratory control limits will be listed in Table B-6 when obtained from the contracted Ecology-accredited laboratory. It should be noted that laboratory control limits may differ from project-specific data usability control limits applied during the external review of the analytical data described in Section 8.2.2.

8.0 Data Validation and Usability

Data reduction is the process of converting raw data to final results. This section describes the processes to be used to review and report field and laboratory data.

8.1 Field Data

Field data validation will be based on information written in the field note books and/or field sheets. Field measurements, calibration records, and instrument data will be reviewed at the end of each field day to ensure completeness and accuracy. Corrections, if needed, will be made in accordance with the procedures described in Section 4.2.

8.2 Laboratory Data

In order to ensure that all laboratory data are of known and acceptable quality, all analytical results generated for the project will undergo two levels of data quality review: at the laboratory, and outside the laboratory (external review).

8.2.1 Laboratory Review

Initial data reduction, review, and reporting will be conducted by the laboratory in accordance with their SOPs and requirements of the analytical method. Laboratory QC data will be compared to the laboratory control limits for each analytical method and parameter. In some cases, reanalysis may be required if the analytical results are outside control limits. For samples that were diluted in order to obtain results within the instrument's calibrated range, results will be reported without a qualifier if all QC criteria are met. If outliers occur during calibration or calibration verification, or other analytical problems are identified, the laboratory will contact the appropriate PM or QAO to discuss the problems/outliers. Professional judgment will be used to determine necessary actions, if any. The problems/outliers will be identified and the corrective measures implemented will be noted in the case narrative from the laboratory. Data will be evaluated and data qualifiers assigned based on the method requirements and guidance for qualification outlined in the U.S. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review.

Laboratory deliverables will include sample and QC results. The laboratory will report analytical data to the PLPs in pdf format (in lieu of paper) and in database format as an Electronic Data Deliverable (EDD). The pdf report and EDD will be checked to ensure reporting consistency and accuracy.

8.2.2 External Review

CH2M will review the laboratory data and prepare a Data Usability Summary that will verify that:

- Sample numbers and analyses match the chain-of-custody request;

- Sample preservation and holding times were met;
- Laboratory QC samples and analyses were performed at the proper frequency, and that no analytes were present in the blanks; and
- Established reporting limits have been achieved.

Data review will also be performed to assess whether the laboratory has met the project-specific control limits for precision, accuracy, and completeness, which are listed in Table B-4. Precision will be assessed based on the RPD of MS/MSD or laboratory duplicate pairs; if the RPD is within these limits, then the precision of the analysis will be assumed to meet the project MQOs. Accuracy will be reviewed by comparing the percent recoveries of surrogates, MS/MSD, and laboratory control samples to the appropriate project-specific control limits. In the event that recoveries associated with project samples are notably low (less than 30%) or high (greater than 160%), but still within the laboratory control limits, the cause(s) for the low or high recoveries, the qualification of sample results, and the effects on data usability will be evaluated by the PLPs during the data review process and documented in the Data Usability Summary. Completeness will be expressed as the percentage of the total tests (including sample and field QC results) conducted that are valid and considered usable for project objectives. Analytical results qualified as estimated based on data quality assessment are considered usable, but the reason for qualification should be considered when using the data. Rejected data are not usable.

As part of the data quality assessment, any initial and diluted results will be compared. If the comparison indicates a difference greater than 20%, the data affected will be identified in the Data Usability Summary. When the initial analysis is an over-dilution and the reanalysis is performed to decrease the reporting limit, the analysis with the lower reporting limit but within the QC criteria will be reported. For samples that are extracted and/or analyzed multiple times due to laboratory QC procedures, the most appropriate data to report will be evaluated individually during data assessment. When evaluating the appropriate data to report, factors such as hold time, QC parameters, and agreement between analyses will be reviewed and the rationale for the decision will be documented in the Data Usability Summary. If several problems or deficiencies are encountered, or specific data appear to be problematic based on the initial data review, more extensive data review will be implemented, such as review of raw data.

In conjunction with the data quality assessment, the database information (EDDs) will be spot checked against the hard copy (pdf) analytical results. If transcription or other errors are discovered by the PLPs, the laboratory will be notified and asked to correct the discrepancy.

9.0 Audits, Corrective Action, and Reports

Internal audits and assessments will be performed by the organization primarily responsible for conducting the task being audited. For example, the PM will assess field sample collection activities, and the contract laboratory will perform internal audits. External assessments, inspections and/or audits are conducted by organizations independent of the responsible party.

Evaluation of field and laboratory QC data and/or audits conducted for field operations and/or laboratory operations may indicate the need for a corrective action. Problems arising during field operations will be addressed by the PM through communication of the identified problem and a potential corrective action to the PM. The PM will then relay the corrective action to the field personnel for implementation. The field personnel will then report back to the PM upon successful implementation of the corrective action. Corrective action for field measurements may include:

- Repeating the measurement;
- Checking instrument adjustments to see that they are appropriate for ambient conditions such as temperature;
- Checking the batteries;
- Checking the calibration; or
- Replacing the instrument or measurement devices.

Problems with analytical QC data will be addressed by the laboratory QC officer and QAO. If concerns develop over the quality of the analytical data, corrective action for sample collection and laboratory analysis may include:

- Reanalysis if holding time permits;
- Resampling and analyzing the samples; or
- Evaluating and amending sampling and analytical procedures.

Ecology will be notified of variances to the QAPP or PMP through written correspondence as deemed appropriate.

9.1 Assessments and Response Actions

Assessments include systems audits and performance audits which are described below. Deficiencies are addressed through a corrective action, which is an action taken to eliminate the causes of a nonconformance, deficiency or other situation to prevent a reoccurrence.

9.1.1 Systems Audits

A technical systems audit of field activities is an on-site, qualitative review of the sampling system to ensure that the activity is being performed in compliance with this QAPP. A technical systems audit may include, as needed, the following items:

- On-site presence and use of project documents (QAPP, SAP, and HASP);
- Appropriate collection of planned samples at specified locations, as described in the SAP;
- Use of SAP specifications for sample collection, tracking, labeling and C-O-C procedures;
- Field instrument calibration and documentation;
- Field crew organization and knowledge of the SAP, technical, and safety issues;
- Documentation of deviations from project plans; and
- Handling and documentation of investigation-derived waste.

After the audit, a debriefing session will be held for all participants discussing the audit results. The debriefing session will focus on significant findings, if any, that may be detrimental to project data quality. The auditor will complete an audit report including observations of the deficiencies and a request for corrective actions. A schedule for responding to the corrective action request and for implementing the corrective actions will be included in the audit report.

A technical systems audit of field sampling activities is not planned for this phase of the project.

The contracted Ecology-accredited laboratory used for this project is accredited by Ecology and through the NELAP program. A technical systems audit of the laboratory is not planned for this project. Technical systems audits of the laboratory are performed, at a minimum at least every two years, as part of the accreditation procedure. As required by the AO, Ecology will have access to laboratory personnel, equipment and records relating to sample collection, transportation and analyses.

9.1.2 Performance Audits

A performance audit is a quantitative audit in which analytical results are generated by a measurement system for a sample that originates outside of a project. A performance audit sample mimics routine field samples in all possible aspects, except that its composition is unknown to the analyst and known to the auditor. Single-blind performance evaluation (PE) samples are ones that the analyst knows are audit samples but the analyst does not know the analytes or the concentrations. Double-blind samples are analyzed without the analyst being aware that they are audit samples. Double-blind samples should not be distinguishable from routine field samples in any way. Thus, double-blind audit samples are processed routinely and are not subjected to any special treatment. Whenever possible, double-blind audit samples

should be introduced into batches of routine field samples before they are shipped to the laboratory. To do this, the audit sample's container, medium, and label, for instance, should be indistinguishable from those of the routine field samples in the batch.

9.1.3 Corrective Actions

Corrective action procedures are established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected. Corrective action procedures facilitate prompt reaction to significant conditions adverse to quality at the Site or laboratory. Additionally, corrective action procedures allow for the cause of the condition to be identified and corrective action to be taken to rectify the problem and to minimize the impact on the data set. Further, corrective action is intended to minimize the possibility of recurrence of the problem.

Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the QAO and the PM, at a minimum. Implementation of corrective action will be verified by documented follow-up action. Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The QAO will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

10.0 Data Management

This section describes the process for data management and document control of the QAPP and SAP, as well as field records and laboratory deliverables.

10.1 Archival Requirements

As required by CD Section XII (Retention of Records), all field and laboratory records, reports, documents, and underlying data shall be preserved for a minimum of ten years from the completion of the work, and throughout the effective period of the CD. Tidewater will make all records available to Ecology upon request, and allow access for review within a reasonable time.

10.2 Document Control

The Project QAO and other signatories shall approve revisions to the QAPP and SAP. Whenever revisions are made or addenda added to the QAPP or SAP, a document control system shall be put into place to ensure 1) all parties holding a controlled copy of the QAPP SAP receive the revisions or addenda, and 2) outdated material is removed from circulation. Project personnel holding controlled copies of the QAPP or SAP will provide certification that they have read, understood and updated their copies of these documents. This certification will be maintained in the project files.

10.3 Field Book

The FTL will maintain a detailed field book. The signature of the author and the date of entry, the project name and number and the location of the work will accompany all entries in the field book. At the beginning of each sampling day, the designated team member will start the daily entry by noting the date and time, the locations to be sampled, weather conditions, field team present, and any potential problems. Other information to be entered into the field book includes observations of field activities, progress, and a description of any problems, summary of equipment preparation procedures and a description of any equipment problems (including corrective action), and explanations of any deviations from the SAP or HSP. An entry in the field note book will be made if detailed records documenting groundwater level measurement and sample collection are logged on pre-printed field record sheets instead of in the field book. At the end of field event the field sampling team will deliver copies of all field book pages and sample collection forms completed to PM.

10.4 Sample Log

The FTL, or designated representative, will be responsible for keeping a sample log to record information regarding each sample. The sample log may be maintained in the field book, or as a separate field form. The required information will include but is not limited to:

- Project number, Facility location;

- Sample location description;
- Sample ID;
- Analyses requested;
- Time, date, sampler name; and
- Equipment used to collect the sample.

10.5 Laboratory Deliverables

The Laboratory Project Manager will provide the data package described below to the QAO within the specified turnaround time. Each data package should contain the reportable and supporting data listed below:

- Completed COC Documentation;
- Sample Identification Cross-Reference;
- Case Narrative;
- Test Reports for Samples;
- MDLs and MRLs;
- LCS, MS/MSD, Surrogate, Laboratory Blank, and Laboratory Duplicate results;

10.5.1 Electronic Data Deliverables

Tidewater will maintain data for the project in a project database. The laboratory will submit EDDs in a format suitable for input into the project database, as well as Ecology's Environmental Information Management (EIM) System.

11.0 References

Greenberg, Arnold E., Lenore S. Clesceri, and Andrew D. Eaton, 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition.

U.S. Environmental Protection Agency (USEPA). 1983. Methods for the Chemical Analysis of Water and Wastes (EPA 600/4-79-020, March 1983), listed in Federal Register on March 12, 2007 (Volume 72, No. 14, pg 11200).

URS Corporation and CH2M, 2011. *Remedial Investigation/Feasibility Study Report for the NWTC Pasco Terminal*, prepared for Chevron Pipe Line Company and Tidewater Terminal Company, September 29, 2011.

U.S. EPA, 1986. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (*SW-846).

U.S. EPA, 2008. U.S. EPA Contract Laboratory Program (CLP) National Functional Guidelines for Superfund Organic Methods Data Review. OSWER 9240.1-48, June 2008.

Washington State Department of Ecology, 2004. Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Publication No. 04-03-030, July 2004.

Washington State Department of Ecology, 1991. Model Toxics Control Act (as amended in 2001 and revised in 2007).

URS and CH2M, 2011. Remedial Investigation/Feasibility Study Report for the NWTC Pasco Terminal, Pasco, Washington. September 29, 2011

Ecology, 2016. State of Washington, Department of Ecology v. Tidewater Terminal Company, Inc., Consent Decree No. 16-250951-11. November 22, 2016.

TABLES

Table B-1
Quality Assurance Project Plan Review Checklist
Tidewater Fuel Line Leak Site
Pasco, Washington

Element	Addressed In
Title Page with Approvals	
Title, author, organization	Cover
Date prepared or revised	Cover
Approval signatures with dates	pp. iv-v
Other signatures, as needed	Not applicable
Table of Contents and Distribution List	pp. i-ii & vi-vii
Background	
Study area and surroundings	Section 1.1 and
Logistical problems	Not applicable
History of study area	Section 1.1
Contaminants of concern	Section 1.1
Results of previous studies	Section 1.1, SAP Section 1.1, QAPP Section 1.1
Regulatory criteria or standards	Section 1.0
Project Description	
Project goals	Section 1.2
Project objectives	Section 1.2
Information needed and sources	Section 2.0
Target population	Section 1.1
Study boundaries	Section 1.0
Tasks required	Section 1.2
Practical constraints	CMP Figure 14
Systematic planning process used	CMP Figure 14
Organization and Schedule	
Key individuals and their responsibilities (project team, decision-makers, stakeholders, lab, etc.)	Section 1.3
Organization chart	Figure B-1
Project schedule	CMP Section 3.0
Limitations on schedule	Not applicable
Budget and funding	Not applicable

Table B-1
Quality Assurance Project Plan Review Checklist
Tidewater Fuel Line Leak Site
Pasco, Washington

Element	Addressed In
Quality Objectives	
Decision quality objectives	Section 3
Measurement quality objectives table targets for:	Tables B-3 & B-4
Precision	Tables B-3 & B-4
Bias	Tables B-3 & B-4
Sensitivity	Table B-3
Sampling Process Design	
Study design	Section 2.0
Sampling location and frequency	Section 2.0
Parameters to be determined	Sections 2.0 & 5.0, & SAP Table A-2
Field measurements	SAP Section 2.0 & Tables A-2 & A-3
Maps or diagrams	SAP Figure A-1
Assumptions underlying design	CMP 3.1 and 3.2
Relation to objectives and site characteristics	CMP 3.1 and 3.2
Characteristics of existing data	CMP 3.1 and 3.2
Sampling Procedures	
Measurement and sample collection	SAP Sections 2.2 & 2.3
Containers, preservation, holding times	SAP Table A-2
Equipment decontamination	SAP Section 7.0
Sample ID	SAP Section 4.1
Chain-of-custody, if required	Section 4.0 & SAP Section 6.2
Field log requirements	SAP Section 5.2
Other activities	SAP Sections 2.1, 2.4 & 2.5
Measurement Methods	
Lab procedures table, including	
Analyte	Table B-2 & SAP Table A-2
Matrix	Table B-2 & SAP Table A-2
Number of samples	SAP Table A-2
Expected range of results	Table B-2
Analytical method	Table B-2 & SAP Table A-2
Sensitivity	Table B-2

Table B-1
Quality Assurance Project Plan Review Checklist
Tidewater Fuel Line Leak Site
Pasco, Washington

Element	Addressed In
Sample preparation method	Not applicable
Special method requirements	Not applicable
Field procedures table	Table B-2

Table B-1
Quality Assurance Project Plan Review Checklist
Tidewater Fuel Line Leak Site
Pasco, Washington

Element	Addressed In
Quality Control	
Table of lab and field QC required	Tables B-4 & B-6, & SAP Tables A-2 & A-3
Corrective action	Section 4.2
Data Management Procedures	
Data recording/reporting requirements	Section 10.0
Lab data package requirements	Section 10.5
Electronic transfer requirements	Section 10.5.1
Acceptance criteria for existing data	Section 3.2
Audits and Reports	
Number, frequency, type, and schedule of audits	Section 9.1
Responsible personnel	Sections 1.3 & 9.0, & Figure B-1
Frequency and distribution of reports	Section 9.0
Responsibility for reports	Section 9.0 & Figure B-1
Data Verification and Validation	
Field data verification, requirements, and responsibilities	Section 8.1
Lab data verification	Section 8.2
Process for data validation	Sections 8.0
Data Quality (Usability) Assessment	
Process for determining whether project objectives have been met	Section 3.0, Tables B-2, B-4 & B-6
Data analysis and presentation methods	Section 8.2
Dealing with non-detects	Not applicable
Evaluating the sampling design	Not applicable
Documentation of assessment	Section 8.2.2

Table B-2
Groundwater Parameters, Methods, Detection Limits, and MTCA Cleanup Levels
Tidewater Fuel Line Leak Site

Parameter	Anticipated Data Uses	Units	Method [a]	Holding Time	Method Detection Limit (MDL) [d]	Method Reporting Limit (MRL) [d]	MTCA Cleanup Levels [e]
Volatile Organic Compounds							
Benzene	GW Characterization, Risk Assessment	ug/L	8260B	14 days (HCl)	0.057	1	5
Toluene		ug/L	8260B	14 days (HCl)	0.076	1	640
Ethylbenzene		ug/L	8260B	14 days (HCl)	0.061	1	800
Total Xylenes		ug/L	8260B	14 days (HCl)	0.179	2	1600
Total Petroleum Hydrocarbons (TPH)							
TPH-Gasoline Range	GW Characterization, Risk Assessment	ug/L	NWTPH-Gx [b]	14 days	10	50	800
TPH-Diesel Range		ug/L	NWTPH-Dx [b]	7 days (to extract); 40 days after extraction	61	125	500
TPH-Heavy Range		ug/L	NWTPH-Dx [b]		48	250	500
Field Parameters							
pH	GW Characterization, Risk Assessment	Std. Units	Field Meters	N/A	Instrument Detection Limits	Instrument Detection Limits	N/A
Temperature		Deg C		N/A			N/A
Conductivity		mS/cm		N/A			N/A
Dissolved Oxygen		mg/L		N/A			N/A
Turbidity		NTU		N/A			N/A
Wet Chemistry							
Manganese	GW Characterization, Natural Attenuation Progress	mg/L	6010B	180 days (HNO_3)	0.0017	0.02	N/A
Ferrous Iron		mg/L	SM3500	24 hours	0.1	0.2	N/A
Sulfate		mg/L	300.0 [c]	28 days	0.4	1.2	N/A

ug/L = micrograms per liter
mg/L = milligrams per liter
GW = Groundwater
mS/cm = milliSiemen per centimeter
NTU = nephelometric turbidity units
N/A = not applicable

NOTES:

[a] EPA SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1986), except as noted.

[b] Washington Department of Ecology, ECY 97-602 (1997).

[c] EPA Method, *Methods for the Chemical Analysis of Water and Wastes* (1983).

[d] MDLs and MRLs are for LAB TBD, Location.

[e] Washington Department of Ecology cleanup levels, as established in the Cleanup Action Plan.

Table B-3
Statistical Calculations
Tidewater Fuel Line Leak Site
Pasco, Washington

Statistic	Symbol	Formula	Definition	Uses
Mean	$\bar{x}$	$\frac{\left(\sum_{i=1}^{n} x_i\right)}{n}$	Measure of central tendency	Used to determine average value of measurements
Standard Deviation	S	$\left(\frac{\sum (x_i - \bar{x})^2}{(n-1)}\right)^{1/2}$	Measure of relative scatter of the data	Used in calculating variation of measurements
Relative Standard Deviation	RSD	$S / \bar{x}$ x 100	Relative standard deviation, adjusts for magnitude of observations	Used to assess precision for replicate results
Relative Percent Difference	RPD	$\text{abs}\left(\frac{(x_1 - x_2)}{(x_1 + x_2)/2}\right)$ x 100	Measure of variability that adjusts for the magnitude of observations	Used to assess total and analytical precision of duplicate measurements
Percent Difference	%D	$\frac{x_1 - x_2}{x_2}$ x 100	Measure of the difference of 2 observations	Used to assess accuracy
Percent Recovery	%R	$\frac{x_{meas}}{x_{true}}$ x 100	Recovery of spiked compound in laboratory matrix	Used to assess accuracy
Percent Recovery	%R	$\frac{\left(\begin{array}{l}\text{value of}\\ \text{spiked}\\ \text{sample}\end{array} - \begin{array}{l}\text{value of}\\ \text{unspiked}\\ \text{sample}\end{array}\right)}{\text{value of added spike}}$ x 100	Recovery of spiked compound in sample matrix	Used to assess matrix effects and total precision
Percent Completeness	% Completeness	$\frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible individual analyte results}}$	Analytical completeness of a data set for risk assessment	Used in calculating analytical completeness
Percent Completeness	% Completeness	$\frac{\text{number of valid sample points}}{\text{number of planned sample points}}$	Analytical completeness of a data set for remedial investigation/feasibility studies	Used in calculating analytical completeness

x = Observation (concentration)
n = Number of observations

Table B-4
Measurement Quality Objectives:
LCS, MS/MSD, and Surrogate Precision and Accuracy
Tidewater Fuel Line Leak Site
Pasco, Washington

Analyte	LCS	MS/MSD		Surrogate
		Aqueous		Aqueous
	%R	%R	RPD	%R
Volatile Organic Compounds				
Benzene	80-120	80-120	30	NA
Toluene	75-120	75-120	30	NA
Ethylbenzene	75-125	75-125	30	NA
m- & p- Xylene	75-120	75-120	30	NA
o-Xylene	80-120	80-120	30	NA
Fluorobenzene	NA	NA	NA	80-120
Toluene-d_8	NA	NA	NA	85-120
Ethylbenzene-d_{10}	NA	NA	NA	80-120
4-Bromofluorobenzene	NA	NA	NA	80-120
Trifluorotoluene	NA	NA	NA	75-120
TPH – Gasoline				
NWTPH-Gx	79-110	50-150	35	NA
Trifluorotoluene	NA	NA	NA	50-150
4-Bromofluorobenzene	NA	NA	NA	50-150
TPH – Diesel (NWTPH-Dx)				
Diesel Range Organics	70-130	70-130	35	NA
Heavy Oil Range Organics	70-130	70-130	35	NA
o-Terphenyl	NA	NA	NA	50-150
Wet Chemistry				
Manganese	80-120	75-125	20	NA
Sulfate	90-110	80-120	20	NA
Acetylene	NA	NA	NA	70-122

NA – Not Applicable
* - Lab duplicate precision
Alternate surrogate standards are acceptable if method recovery criteria are met.
The control limits for these analytical methods have been obtained from TestAmerica Laboratories, Inc. in Seattle (Tacoma), Washington.

Table B-5
Calibration Procedures Summary
Tidewater Fuel Line Leak Site
Pasco, Washington

Parameter Measured	Method Description[1]	Calibration Summary	
		Activity	**Requirements**
Volatile Organic Compounds: Benzene Toluene Ethylbenzene Xylenes (total)	EPA SW-846 8260B GC/MS, Purge & Trap	Instrument Performance Check	Run bromofluorobenzene (BFB) for each 12-hour shift. Must meet ion abundance criteria before calibration, per the method. Adjust tune as needed to meet criteria.
		Initial Calibration	Analyze a minimum of five concentrations for each analyte of interest. Minimum relative response factor (0.30/0.10) and maximum %RSD (≤15%) criteria must be met for each system performance check compounds (SPCC) and calibration check compounds (CCC) before any samples are analyzed. Prepare calibration curve for any compound with a %RSD greater than 15%. Take corrective action when criteria not met. The lowest calibration standard establishes the MQL based on laboratory standard operating procedures for initial volume of sample and final volume of extract.
		Calibration Verification	Verify calibration curve every 12 hours with a check standard. Minimum RRF (0.30/0.10) and maximum %D (≤20%) criteria must be met for each SPCC and CCC.
Total Petroleum Hydrocarbons	ECY 97-602 NWTPH-Gx and NWTPH-Dx GC/FID, Purge & Trap	Instrument Performance Check	Run mid-range calibration check standard for each 12-hour shift. Value must not vary from the acceptance criteria by more than ± 20%. Repeat with second mid-range calibration check standard. If second standard fails acceptance criteria, recalibrate.
		Initial Calibration	Analyze a minimum of five concentrations for each analyte of interest. Minimum relative response factor and maximum %RSD (≤20%) criteria must be met for each SPCC and CCC before any samples are analyzed. Prepare calibration curve for any compound with a %RSD greater than 20%. Take corrective action when criteria not met.
		Calibration Verification	Verify calibration curve and retention times at the beginning of each 12-hour shift, after every 10 samples, and of run, with one or more calibration standards.

Table B-6
Quality Control Analyses and Frequencies
Tidewater Fuel Line Leak Site
Pasco, Washington

Quality Control Parameter	Volatiles	TPH
Method	EPA SW-846 8260B	ECY 97-602: NWTPH-Gx and NWTPH-Dx
Method Detection Limit (MDL)	See Table B-2	See Table B-2
Method Reporting Limit (MRL)	See Table B-2	See Table B-2
Holding Times	See Table B-2	See Table B-2
Equipment Blank	Per sampling event and equipment type: 1 for Tidewater wells <MRL	Per sampling event and equipment type: 1 for Tidewater wells <MRL
Field Duplicate	Per sampling event: 1 for Tidewater wells ≤30 RPD (aqueous)	Per sampling event: 1 for Tidewater wells ≤30 RPD (aqueous)
Trip Blank	One per cooler with volatiles samples <MRL	NA
Instrument Tune/Calibration	See Table B-5	See Table B-5
Preparation (Laboratory) Blank	One per batch per sample preparation method per matrix (maximum 20 samples) <MRL (<5x MRL for common lab contaminants)	One per batch per sample preparation method per matrix (maximum 20 samples) <MRL (<5x MRL for common lab contaminants)
Surrogate	Every sample % Recovery See Table B-4	Every sample % Recovery See Table B-4
Matrix Spike	One per 20 samples per matrix %Recovery	One per 20 samples per matrix %Recovery

Table B-6
Quality Control Analyses and Frequencies
Tidewater Fuel Line Leak Site
Pasco, Washington

Quality Control Parameter	Volatiles	TPH
	See Table B-4	See Table B-4
Matrix Spike Duplicate	One per 20 samples per matrix % Recovery RPD See Table B-4	One per 20 samples per matrix % Recovery RPD See Table B-4
Internal Standard Area	Each sample 50-100% of amount in calibration standard; Retention time within ±30 seconds from last calibration	NA
Laboratory Control Sample	One per extraction batch per matrix %Recovery See Table B-4	One per extraction batch per matrix %Recovery See Table B-4
Identification Criteria	Intensities of characteristic ions maximize in same scan or within one scan RRT of sample analyte is within ±0.06 RRT of standard analyte Relative intensities of sample characteristic ions agree within ± 30% of reference spectrum ions	Gasoline range hydrocarbons are identified on the basis of the ranges of retention times for the characteristic component pattern set for the method specified marker/locator compound. RT markers are set for NWTPH-Gx at a minimum from Toluene through 1-Methylnaphthalene (inclusive). RT width is set at window is ±0.03 RRT from the lower and upper RT markers.
Method Detection Limit (MDL) Verification	Annual during sample analyses No control limits	Annual during sample analyses No control limits

NA = Not Applicable
MRL = Method Reporting Limit
RPD = Relative Percent Difference
RT = Retention Time
RRT = Relative Retention Time
RWT = Retention Time Window

Note: One complete batch of QC samples will be collected and submitted for each round of sampling.

APPENDIX C
Tesoro Logistics Pasco Bulk Terminal
1st Semi-Annual 2015 Ground-Water Monitoring and Exploration Boring Data Transmittal

July 31, 2015

Via Email

William J. Fees, P.E. and Patrick Cabbage, L.G.
Eastern Regional Office-Toxics Cleanup Program
WA Department of Ecology
4601 N. Monroe Street
Spokane, WA 99205-1295

RE: **1st Semi-Annual 2015 Ground-Water Monitoring and Exploratory Boring Data Transmittal**
Tesoro Logistics (Former Chevron) Pasco Bulk Terminal
2900 Sacajawea Park Road, Pasco, Washington 99301
Ecology Facility Site ID: 55763995; Cleanup Site ID: 4867

Dear Messrs. Fees and Cabbage:

Please find the enclosed ground-water monitoring data summary table (Table 1), site figures and copies of laboratory data reports for the 1st semi-annual 2015 monitoring event completed at the Tesoro Logistics (Former Chevron) Pasco Bulk Terminal on Sacajawea Road in Pasco, Washington. These data are transmitted on behalf of Tesoro Logistics Operations LLC (Tesoro).

Also included are soil and ground-water data summary tables, site figures, boring logs and copies of laboratory data reports for samples collected from exploratory borings CB-1 and CB-2. Samples were collected from the two borings in June 2015 in accordance with Ecology's letter dated April 20, 2015. The soil and grab ground-water sampling data were collected to investigate whether Tidewater's TPH gasoline plume is commingled with Tesoro's plume (primarily TPH diesel) in the area peripheral to Tidewater monitoring wells MW-7 and MW-8 (Figures 1 and 2).

Soil sample data from the borings show petroleum hydrocarbons were essentially not reported at concentrations above laboratory reporting limits at both boring locations, confirming there is no commingling of hydrocarbons from the two sites in vadose-zone soil (Table 2). The soil data results also confirm the absence of a potential source of hydrocarbon release in the general area of the Tesoro site where the borings are located.

Grab ground-water sample data from the borings show TPH gasoline results are below laboratory reporting limits (i.e., <250 ug/l) at both borings (Table 3). These data confirm Tidewater's TPH gasoline plume is not commingled with the Tesoro TPH diesel plume at the boring locations (Figure 2).

Further description and evaluation of the attached data are planned to be included in a future monitoring and/or investigation report.

769 Center Boulevard, #123, Fairfax, CA 94930 | 415/488-1738
jhennier@azureenvironmental.com

Please feel free to call me at 415/488-1738 if you have any questions.

Sincerely,

Jeff Hennier, L.G.
Principal Hydrogeologist

cc: Jeffrey M. Baker, P.E., Tesoro
Wil Ricard, Ryan Biggs, Tesoro Logistics
Vanessa Vail, Tesoro
Michael Dunning, Perkins Coie LLP
William H. Collins, Tidewater
Steve Thiele, Stoel Rives LLP
Bob Martin, CH2M Hill

TABLE 1
JUNE 2015 GROUND-WATER MONITORING DATA - TESORO WELLS
Tesoro Logistics Pasco Terminal
Pasco, Washington

Sample Location	Date Sampled	Ground-Water Sample Analysis Results (ug/l)											Ground-Water Elevation Data (feet)				
		TPHmo (NWTPH-Rx)	TPHd (NWTPH-Dx)	TPHg (NWTPH-Gx)	Benz-ene	Tol-uene	Ethyl-benzene	Total Xylenes	MTBE	Ethanol	1,2-DCA	Naph-thalene	Well Screen Depth Interval	TOC Elevation	DTW	Elev-ation (MSL)	Change in Elevation
Tesoro Logistics (former CPL)																	
MW-1	6/3/15	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	73.9 - 93.9	419.40	Dry	--	--
MW-2	6/4/15	<250	140	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	63.3 - 83.3	417.28	73.31	343.97	0.72
MW-3	6/4/15	<250	**3,300**	<250	<0.50	<0.50	<0.50	<1.0	<0.50	24.8	<0.50	0.51	74.95 - 94.95	423.42	79.46	343.96	0.72
MW-4	6/3/15	<250	<100	<250	<0.50	0.52	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	56.75 - 76.75	412.09	68.48	343.61	0.69
MW-5	Well destroyed May 1987.																
MW-6	6/3/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	8.5 - 23.5	358.61	16.18	342.43	0.64
MW-7	6/3/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	57 - 77	411.40	67.48	343.92	0.75
MW-8	6/3/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	29 - 54	383.91	40.04	343.87	0.74
MW-9	Well destroyed May 1987.																
MW-10	6/3/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	55 - 78	407.91	63.91	344.00	0.77
MW-11	6/4/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	84.5 - 74.5	423.48	79.55	343.93	0.76
MW-12	6/4/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	33 - 60; 75 - 85	423.65	79.72	343.93	0.73
	Duplicate	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50					
MW-13	6/4/15	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	18.5 - 47.5	--	Dry	--	--
MW-14	6/4/15	<250	<100	<250	<0.50	0.72	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50	27.5 - 53; 72.5 - 82.5	421.97	78.04	343.93	0.76
RW-1	6/3/15	Well buried - status unknown											64- 98	417.29	--	--	--
Equipment Blank:																	
EB-0615	6/4/15	<250	<100	<250	<0.50	<0.50	<0.50	<1.0	<0.50	<5.0	<0.50	<0.50					
Ecology Criteria[1]		*500*	*500*	*1,000*	*5*	*1,000*	*700*	*1,000*	*20*	*N/A*							

TABLE 1 (cont.)

Notes:

(1) Washington Department of Ecology Method A cleanup levels as listed in Table 720-1 of the Model Toxics Control Act, revised 10/12/07
(2) 93.2 ug/l Methanol reported at MW-3
(3) 5.0 ug/l TBA reported at MW-7
(4) 55.6 ug/l Methanol reported at MW-8
(5) 63.7 ug/l Methanol reported at MW-10
(6) 52.6 ug/l Methanol reported at MW-11
(7) 53.3 ug/l Methanol reported at MW-12

TPHmo = Total Petroleum Hydrocarbons as Motor Oil
TPHd = Total Petroleum Hydrocarbons as Diesel
TPHg = Total Petroleum Hydrocarbons as Gasoline
TOC = Top of casing elevation in feet MSL

DTW = Depth to water
MSL = Mean sea level
NS = Not sampled
-- = Not analyzed

Concentrations in **bold** exceed Ecology cleanup levels.
Change in elevations calculated using previous data collected 10/29/2014.

TABLE 2
SUMMARY OF CONFIRMATION SOIL ANALYTICAL RESULTS - JUNE 2015
Tesoro Logistics Pasco Terminal
Pasco, Washington

Sample Location	Date Sampled	Sample Depth (feet)	Soil Sample Analysis Results (mg/kg)									
			TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naph-thalene	Fuel Oxygenates	Lead Scavengers
MTCA Method A Soil Cleanup Levels:			*30/100*	*2,000*	*2,000*	*0.03*	*7*	*6*	*9*	*5*		
CB-1-Soil	6/1/2015	10	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		20	<250	**2.2**	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		30	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		45	<250	**1.2**	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		55	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		65	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		75	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		79	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
CB-2-Soil	6/2/2015	15	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		24	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		35	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		45	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		55	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		65	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		75	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND
		79	<250	<1.0	<10	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	ND	ND

Notes:

– = Not analyzed
NE = Not established
ND = Not detected
MTCA = Model Toxics Control Act

All results in milligrams per kilogram (mg/kg) unless otherwise indicated.
TPHg = Total petroleum hydrocarbons as gasoline analyzed by Northwest Method NWTPH-Gx.
TPHd = Total petroleum hydrocarbons as diesel, analyzed by Northwest Method NWTPH-Dx with silica gel cleanup.
TPHo = Total petroleum hydrocarbons as motor oil, analyzed by Northwest Method NWTPH-Dx with silica gel cleanup.
BTEX = Benzene, toluene, ethylbenzene, and total xylenes.
Lead Scavengers = EDB, EDC (1,2-DCA)
Fuel Oxygenates = MTBE, DIPE, ETB, TAME, TBA, Methanol, Ethanol

TABLE 3
SUMMARY OF CONFIRMATION GRAB GROUNDWATER ANALYTICAL RESULTS - JUNE 2015
Tesoro Logistics Pasco Terminal
Pasco, Washington

Sample Location	Date Sampled	Grab Groundwater Sample Analysis Results (ug/l)									
		TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Naph-thalene	Fuel Oxygenates	Lead Scavengers
MTCA Method A Groundwater Cleanup Levels:		*1,000*	*500*	*500*	*5*	*1,000*	*700*	*1,000*	*160*		
CB-1-Water	6/1/2015	<250	**2,400**	**3,900**	<0.50	<0.50	<0.50	<1.0	<0.50	ND(1)	ND
CB-2-Water	6/2/2015	<250	**3,100**	**4,600**	0.67	<0.50	<0.50	<1.0	<0.50	ND	ND
CB-2-Water2	6/2/2015	<250	**1,200**	**1,700**	0.53	<0.50	<0.50	<1.0	<0.50	ND(2)	ND

Notes:

All results in micrograms per liter (ug/l).

Two grab groundwater samples were collected in succession from boring CB-2: one prior to and one after purging water from the sonic discrete water sampler.

Concentrations in **bold** exceed Ecology cleanup levels.

(1) = 18.5 ug/l ethanol also reported

(2) = 17.3 ug/l ethanol also reported

-- = Not analyzed
ND = Not detected
MTCA = Model Toxics Control Act

TPHg = Total petroleum hydrocarbons as gasoline analyzed by Northwest Method NWTPH-Gx.
TPHd = Total petroleum hydrocarbons as diesel, analyzed by Northwest Method NWTPH-Dx with silica gel cleanup.
TPHo = Total petroleum hydrocarbons as motor oil, analyzed by Northwest Method NWTPH-Dx with silica gel cleanup.
BTEX = Benzene, toluene, ethylbenzene, and total xylenes.
Lead Scavengers = EDB, EDC (1,2-DCA)
Fuel Oxygenates = MTBE, DIPE, ETB, TAME, TBA, Methanol, Ethanol

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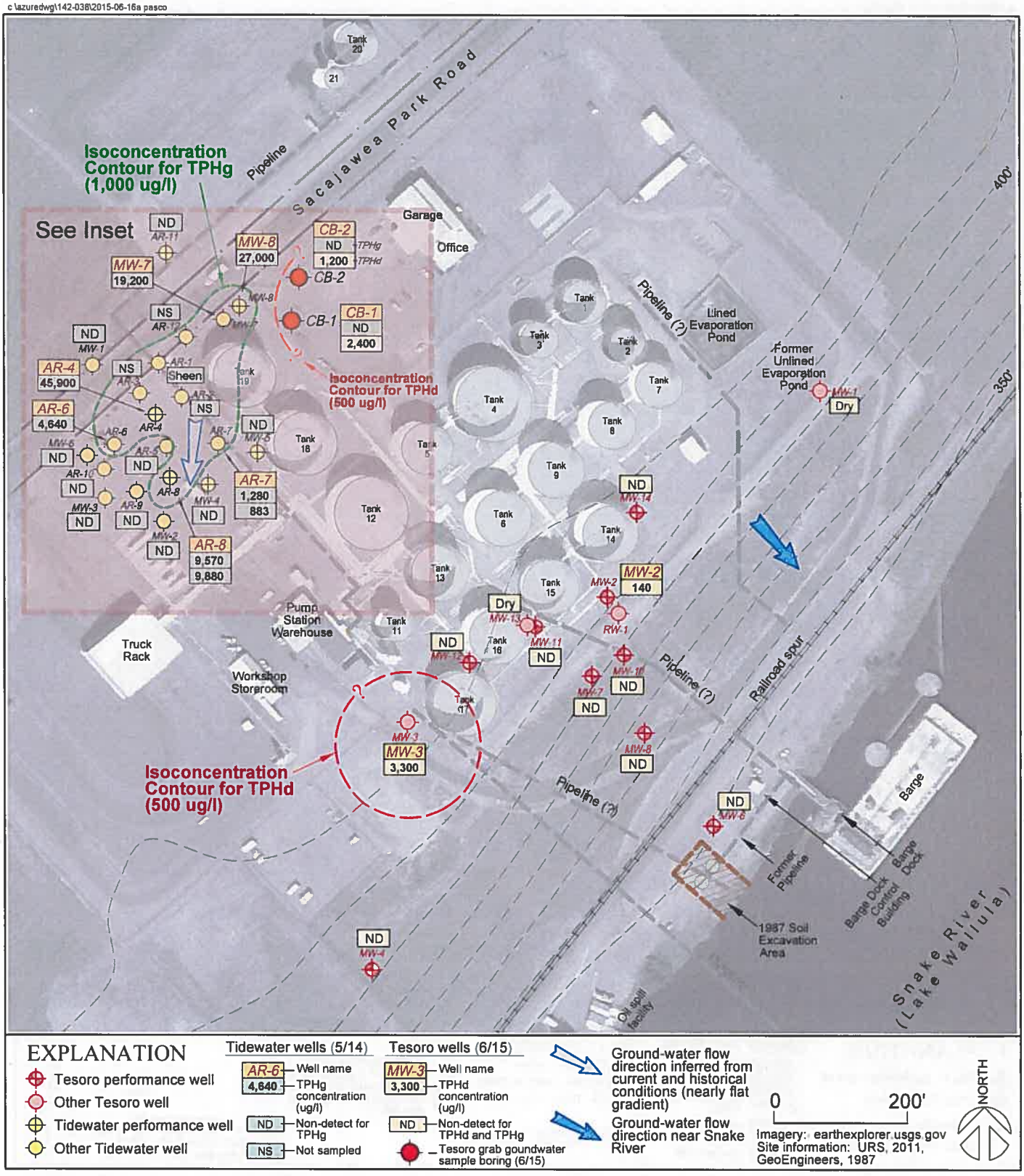

AZURE ENVIRONMENTAL

Figure 1: Groundwater TPHg/TPHd Results, May 2014 and June 2015

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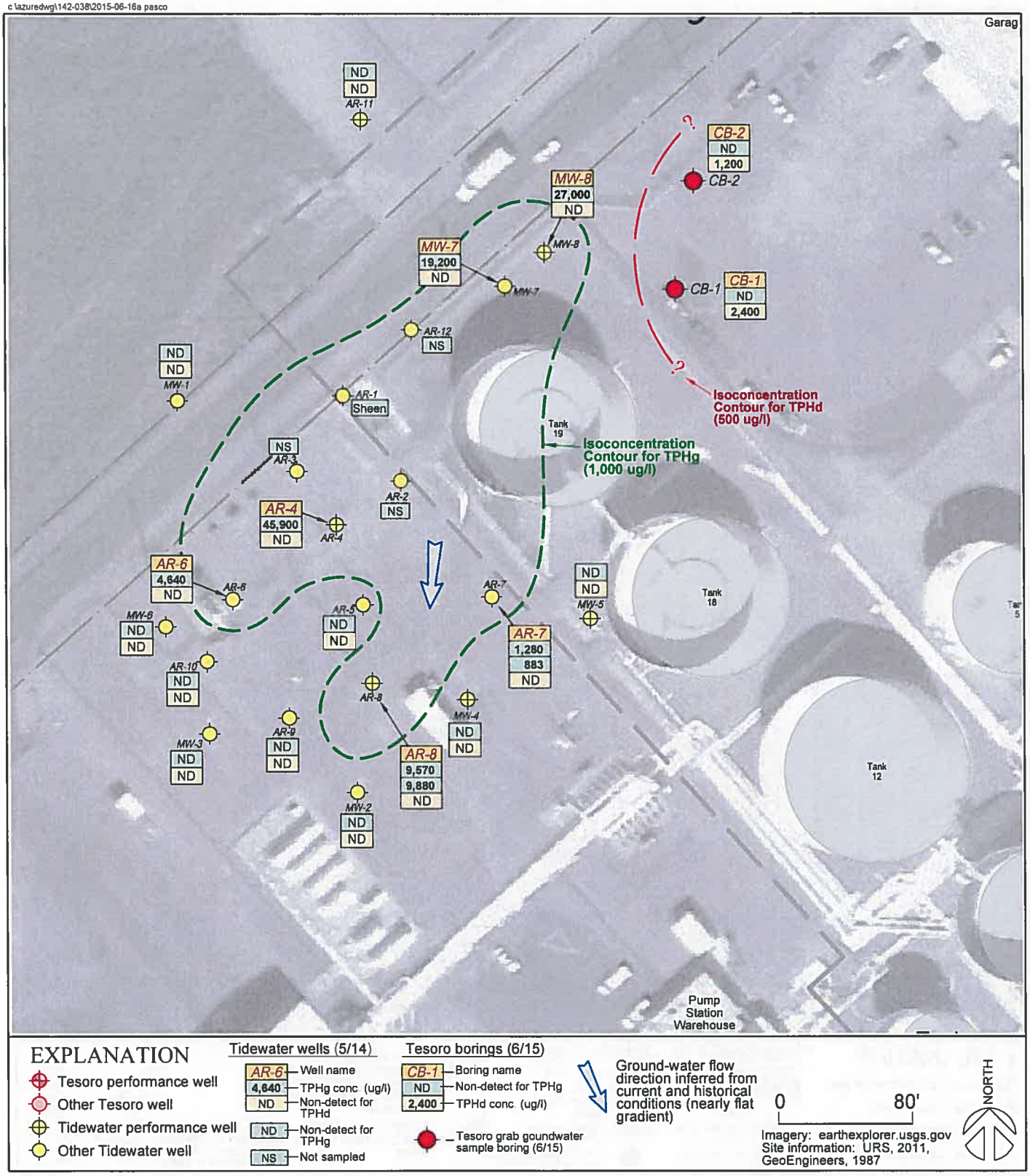

AZURE ENVIRONMENTAL

Figure 2: Groundwater TPHg/TPHd Results for Tidewater Wells (May 2014) and Tesoro Borings CB-1 and CB-2 (June 2015)

ATTACHMENT 1

JUNE 2015 LABORATORY DATA REPORTS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

June 22, 2015

Jeff Hennier
Azure Environmental
769 Center Boulevard
123
Fairfax, CA 94930

RE: Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Dear Jeff Hennier:
Enclosed are the analytical results for sample(s) received by the laboratory on June 05, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Some analyses have been subcontracted outside of the Pace Network. The subcontracted laboratory report has been attached.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott Forbes

Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

CERTIFICATIONS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Davis Cerification IDs
2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-14a
California Certification #: 08263CA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

SAMPLE SUMMARY

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1248143001	C-MW-02-0615	Water	06/04/15 10:25	06/05/15 09:55
1248143002	C-MW-03-0615	Water	06/04/15 14:40	06/05/15 09:55
1248143003	C-MW-04-0615	Water	06/03/15 09:50	06/05/15 09:55
1248143004	C-MW-06-0615	Water	06/03/15 17:25	06/05/15 09:55
1248143005	C-MW-07-0615	Water	06/03/15 11:18	06/05/15 09:55
1248143006	C-MW-08-0615	Water	06/03/15 16:15	06/05/15 09:55
1248143007	C-MW-10-0615	Water	06/03/15 14:55	06/05/15 09:55
1248143008	C-MW-11-0615	Water	06/04/15 11:48	06/05/15 09:55
1248143009	C-MW-12-0615	Water	06/04/15 13:25	06/05/15 09:55
1248143010	C-MW-12D-0615	Water	06/04/15 13:25	06/05/15 09:55
1248143011	C-MW-14-0615	Water	06/04/15 09:00	06/05/15 09:55
1248143012	C-EB-0615	Water	06/04/15 07:15	06/05/15 09:55

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

SAMPLE ANALYTE COUNT

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1248143001	C-MW-02-0615	EPA 200.7	JLL	1	PASI-DAV
		NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
		EPA 300.0	JLL	1	PASI-DAV
1248143002	C-MW-03-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143003	C-MW-04-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143004	C-MW-06-0615	EPA 200.7	JLL	1	PASI-DAV
		NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
		EPA 300.0	JLL	1	PASI-DAV
1248143005	C-MW-07-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143006	C-MW-08-0615	EPA 200.7	JLL	1	PASI-DAV
		NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
		EPA 300.0	JLL	1	PASI-DAV
1248143007	C-MW-10-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143008	C-MW-11-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

SAMPLE ANALYTE COUNT

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		NWTPH-Gx	JCP	4	PASI-DAV
1248143009	C-MW-12-0615	EPA 200.7	JLL	1	PASI-DAV
		NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
		EPA 300.0	JLL	1	PASI-DAV
1248143010	C-MW-12D-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143011	C-MW-14-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248143012	C-EB-0615	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JMB	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-02-0615 **Lab ID: 1248143001** Collected: 06/04/15 10:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Lab Filtered	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Manganese, Dissolved	ND	ug/L	5.0	1	06/11/15 11:16	06/12/15 13:27	7439-96-5	
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**0.14**	mg/L	0.10	1	06/17/15 18:04	06/19/15 16:53		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 16:53		CL
Surrogates								
n-Octacosane (S)	147	%.	70-130	1	06/17/15 18:04	06/19/15 16:53	630-02-4	S5
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 05:41	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 05:41	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		06/11/15 05:41	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:08	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 00:08	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 00:08	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 00:08	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 00:08	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 00:08	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 00:08	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 00:08	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:08	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 00:08	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 00:08	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 00:08	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/12/15 00:08	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 00:08	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		06/12/15 00:08	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 00:31		
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/13/15 00:31	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 00:31	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	70-130	1		06/13/15 00:31	460-00-4	
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**107**	mg/L	2.5	5		06/08/15 23:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-03-0615 **Lab ID: 1248143002** Collected: 06/04/15 14:40 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**3.3**	mg/L	0.099	1	06/17/15 18:04	06/19/15 17:28		S5
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 17:28		
Surrogates								
n-Octacosane (S)	132	%.	70-130	1	06/17/15 18:04	06/19/15 17:28	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	**24.8**	ug/L	5.0	1		06/11/15 01:42	64-17-5	R1
Methanol	**93.2**	ug/L	50.0	1		06/11/15 01:42	67-56-1	1V,M1, R1
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/11/15 01:42	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/11/15 22:14	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/11/15 22:14	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/11/15 22:14	107-06-2	
Toluene	ND	ug/L	0.50	1		06/11/15 22:14	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/11/15 22:14	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/11/15 22:14	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/11/15 22:14	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/11/15 22:14	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/11/15 22:14	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/11/15 22:14	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/11/15 22:14	75-65-0	
Naphthalene	**0.51**	ug/L	0.50	1		06/11/15 22:14	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%.	70-130	1		06/11/15 22:14	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/11/15 22:14	2037-26-5	
4-Bromofluorobenzene (S)	102	%.	70-130	1		06/11/15 22:14	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/12/15 20:55		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/12/15 20:55	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		06/12/15 20:55	2037-26-5	
4-Bromofluorobenzene (S)	101	%.	70-130	1		06/12/15 20:55	460-00-4	

Sample: C-MW-04-0615 **Lab ID: 1248143003** Collected: 06/03/15 09:50 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 18:03		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 18:03		CL
Surrogates								
n-Octacosane (S)	126	%.	70-130	1	06/17/15 18:04	06/19/15 18:03	630-02-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-04-0615 **Lab ID: 1248143003** Collected: 06/03/15 09:50 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 06:18	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 06:18	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/11/15 06:18	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:30	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 00:30	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 00:30	107-06-2	
Toluene	**0.52**	ug/L	0.50	1		06/12/15 00:30	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 00:30	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 00:30	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 00:30	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 00:30	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:30	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 00:30	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 00:30	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 00:30	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/12/15 00:30	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 00:30	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		06/12/15 00:30	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 00:58		
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/13/15 00:58	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 00:58	2037-26-5	
4-Bromofluorobenzene (S)	93	%.	70-130	1		06/13/15 00:58	460-00-4	

Sample: C-MW-06-0615 **Lab ID: 1248143004** Collected: 06/03/15 17:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Lab Filtered	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Manganese, Dissolved	ND	ug/L	5.0	1	06/11/15 11:16	06/12/15 13:37	7439-96-5	
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 18:38		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 18:38		CL
Surrogates								
n-Octacosane (S)	136	%.	70-130	1	06/17/15 18:04	06/19/15 18:38	630-02-4	S5
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 06:54	64-17-5	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-06-0615 **Lab ID: 1248143004** Collected: 06/03/15 17:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260B							
Methanol	ND	ug/L	50.0	1		06/11/15 06:54	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		06/11/15 06:54	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:53	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 00:53	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 00:53	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 00:53	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 00:53	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 00:53	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 00:53	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 00:53	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 00:53	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 00:53	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 00:53	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 00:53	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/12/15 00:53	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 00:53	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		06/12/15 00:53	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 01:25		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/13/15 01:25	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 01:25	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	70-130	1		06/13/15 01:25	460-00-4	
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**107**	mg/L	2.5	5		06/09/15 04:07	14808-79-8	

Sample: C-MW-07-0615 **Lab ID: 1248143005** Collected: 06/03/15 11:18 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 19:13		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 19:13		CL
Surrogates								
n-Octacosane (S)	131	%.	70-130	1	06/17/15 18:04	06/19/15 19:13	630-02-4	S0
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 15:37	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 15:37	67-56-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-07-0615 **Lab ID: 1248143005** Collected: 06/03/15 11:18 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	1		06/11/15 15:37	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 01:16	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 01:16	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 01:16	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 01:16	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 01:16	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 01:16	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 01:16	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 01:16	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 01:16	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 01:16	994-05-8	
tert-Butyl Alcohol	**5.0**	ug/L	5.0	1		06/12/15 01:16	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 01:16	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/12/15 01:16	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 01:16	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		06/12/15 01:16	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 01:52		
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		06/13/15 01:52	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 01:52	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	70-130	1		06/13/15 01:52	460-00-4	

Sample: C-MW-08-0615 **Lab ID: 1248143006** Collected: 06/03/15 16:15 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Lab Filtered	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Manganese, Dissolved	ND	ug/L	5.0	1	06/11/15 11:16	06/12/15 13:47	7439-96-5	
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 19:48		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 19:48		CL
Surrogates								
n-Octacosane (S)	132	%.	70-130	1	06/17/15 18:04	06/19/15 19:48	630-02-4	S0
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 16:13	64-17-5	
Methanol	**55.6**	ug/L	50.0	1		06/11/15 16:13	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		06/11/15 16:13	17060-07-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-08-0615 **Lab ID: 1248143006** Collected: 06/03/15 16:15 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 02:23	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 02:23	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 02:23	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 02:23	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 02:23	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 02:23	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 02:23	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 02:23	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 02:23	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 02:23	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 02:23	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 02:23	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	70-130	1		06/12/15 02:23	17060-07-0	
Toluene-d8 (S)	98	%.	70-130	1		06/12/15 02:23	2037-26-5	
4-Bromofluorobenzene (S)	90	%.	70-130	1		06/12/15 02:23	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 02:19		
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/13/15 02:19	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 02:19	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	70-130	1		06/13/15 02:19	460-00-4	
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**108**	mg/L	2.5	5		06/09/15 04:17	14808-79-8	

Sample: C-MW-10-0615 **Lab ID: 1248143007** Collected: 06/03/15 14:55 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 20:23		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 20:23		CL
Surrogates								
n-Octacosane (S)	139	%.	70-130	1	06/17/15 18:04	06/19/15 20:23	630-02-4	S0
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 16:50	64-17-5	
Methanol	**63.7**	ug/L	50.0	1		06/11/15 16:50	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/11/15 16:50	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 02:51	1634-04-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-10-0615 **Lab ID: 1248143007** Collected: 06/03/15 14:55 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Benzene	ND	ug/L	0.50	1		06/12/15 02:51	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 02:51	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 02:51	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 02:51	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 02:51	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 02:51	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 02:51	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 02:51	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 02:51	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 02:51	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 02:51	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	70-130	1		06/12/15 02:51	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1		06/12/15 02:51	2037-26-5	
4-Bromofluorobenzene (S)	87	%.	70-130	1		06/12/15 02:51	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 02:46		
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		06/13/15 02:46	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 02:46	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	70-130	1		06/13/15 02:46	460-00-4	

Sample: C-MW-11-0615 **Lab ID: 1248143008** Collected: 06/04/15 11:48 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.099	1	06/17/15 18:04	06/19/15 20:58		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 20:58		CL
Surrogates								
n-Octacosane (S)	128	%.	70-130	1	06/17/15 18:04	06/19/15 20:58	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 17:26	64-17-5	
Methanol	**52.6**	ug/L	50.0	1		06/11/15 17:26	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/11/15 17:26	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 03:20	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 03:20	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 03:20	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 03:20	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 03:20	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 03:20	100-41-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-11-0615 **Lab ID: 1248143008** Collected: 06/04/15 11:48 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 03:20	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 03:20	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 03:20	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 03:20	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 03:20	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 03:20	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	70-130	1		06/12/15 03:20	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	1		06/12/15 03:20	2037-26-5	
4-Bromofluorobenzene (S)	85	%.	70-130	1		06/12/15 03:20	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 03:13		
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/13/15 03:13	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 03:13	2037-26-5	
4-Bromofluorobenzene (S)	96	%.	70-130	1		06/13/15 03:13	460-00-4	

Sample: C-MW-12-0615 **Lab ID: 1248143009** Collected: 06/04/15 13:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP, Lab Filtered	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Manganese, Dissolved	**201**	ug/L	5.0	1	06/11/15 11:16	06/12/15 13:51	7439-96-5	
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.099	1	06/17/15 18:04	06/19/15 21:32		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 21:32		CL
Surrogates								
n-Octacosane (S)	135	%.	70-130	1	06/17/15 18:04	06/19/15 21:32	630-02-4	S0
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 18:02	64-17-5	
Methanol	**53.3**	ug/L	50.0	1		06/11/15 18:02	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	1		06/11/15 18:02	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 05:50	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 05:50	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 05:50	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 05:50	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 05:50	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 05:50	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 05:50	1330-20-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-12-0615 **Lab ID: 1248143009** Collected: 06/04/15 13:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 05:50	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 05:50	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 05:50	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 05:50	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 05:50	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	114	%.	70-130	1		06/12/15 05:50	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1		06/12/15 05:50	2037-26-5	
4-Bromofluorobenzene (S)	88	%.	70-130	1		06/12/15 05:50	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 03:40		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/13/15 03:40	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		06/13/15 03:40	2037-26-5	
4-Bromofluorobenzene (S)	93	%.	70-130	1		06/13/15 03:40	460-00-4	
300.0 IC Anions	Analytical Method: EPA 300.0							
Sulfate	**113**	mg/L	2.5	5		06/08/15 23:52	14808-79-8	

Sample: C-MW-12D-0615 **Lab ID: 1248143010** Collected: 06/04/15 13:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 22:07		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 22:07		CL
Surrogates								
n-Octacosane (S)	129	%.	70-130	1	06/17/15 18:04	06/19/15 22:07	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 18:39	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 18:39	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/11/15 18:39	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 06:18	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 06:18	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 06:18	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 06:18	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 06:18	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 06:18	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 06:18	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 06:18	108-20-3	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-12D-0615 **Lab ID: 1248143010** Collected: 06/04/15 13:25 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 06:18	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 06:18	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 06:18	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 06:18	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	121	%.	70-130	1		06/12/15 06:18	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 06:18	2037-26-5	
4-Bromofluorobenzene (S)	90	%.	70-130	1		06/12/15 06:18	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 04:07		
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/13/15 04:07	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 04:07	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1		06/13/15 04:07	460-00-4	

Sample: C-MW-14-0615 **Lab ID: 1248143011** Collected: 06/04/15 09:00 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 22:42		
Motor Oil Range	ND	mg/L	0.25	1	06/17/15 18:04	06/19/15 22:42		CL
Surrogates								
n-Octacosane (S)	127	%.	70-130	1	06/17/15 18:04	06/19/15 22:42	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 19:15	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 19:15	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/11/15 19:15	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 10:31	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 10:31	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 10:31	107-06-2	
Toluene	**0.72**	ug/L	0.50	1		06/12/15 10:31	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 10:31	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 10:31	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 10:31	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 10:31	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 10:31	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 10:31	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 10:31	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 10:31	91-20-3	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-MW-14-0615 **Lab ID: 1248143011** Collected: 06/04/15 09:00 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	70-130	1		06/12/15 10:31	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		06/12/15 10:31	2037-26-5	
4-Bromofluorobenzene (S)	89	%.	70-130	1		06/12/15 10:31	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 04:34		
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1		06/13/15 04:34	17060-07-0	
Toluene-d8 (S)	102	%.	70-130	1		06/13/15 04:34	2037-26-5	
4-Bromofluorobenzene (S)	94	%.	70-130	1		06/13/15 04:34	460-00-4	

Sample: C-EB-0615 **Lab ID: 1248143012** Collected: 06/04/15 07:15 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx	Preparation Method: EPA 3510						
Diesel Fuel Range	ND	mg/L	0.10	1	06/17/15 18:04	06/19/15 23:17		
Motor Oil Range	ND	mg/L	0.26	1	06/17/15 18:04	06/19/15 23:17		CL
Surrogates								
n-Octacosane (S)	124	%.	70-130	1	06/17/15 18:04	06/19/15 23:17	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 19:51	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 19:51	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	1		06/11/15 19:51	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 10:03	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/12/15 10:03	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/12/15 10:03	107-06-2	
Toluene	ND	ug/L	0.50	1		06/12/15 10:03	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/12/15 10:03	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/12/15 10:03	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/12/15 10:03	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/12/15 10:03	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/12/15 10:03	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/12/15 10:03	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/12/15 10:03	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/12/15 10:03	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	117	%.	70-130	1		06/12/15 10:03	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	1		06/12/15 10:03	2037-26-5	
4-Bromofluorobenzene (S)	87	%.	70-130	1		06/12/15 10:03	460-00-4	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Sample: C-EB-0615 **Lab ID: 1248143012** Collected: 06/04/15 07:15 Received: 06/05/15 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/14/15 09:52		
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1		06/14/15 09:52	17060-07-0	
Toluene-d8 (S)	103	%.	70-130	1		06/14/15 09:52	2037-26-5	
4-Bromofluorobenzene (S)	95	%.	70-130	1		06/14/15 09:52	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAMP/1238 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET Dissolved
Associated Lab Samples: 1248143001, 1248143004, 1248143006, 1248143009

METHOD BLANK: 218017 Matrix: Water
Associated Lab Samples: 1248143001, 1248143004, 1248143006, 1248143009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Manganese, Dissolved	ug/L	ND	5.0	06/12/15 13:20	

LABORATORY CONTROL SAMPLE: 218018

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Manganese, Dissolved	ug/L	400	371	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218019 218020

Parameter	Units	1248143001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese, Dissolved	ug/L	ND	400	400	368	367	91	91	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAOP/1206 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS, Silica Gel
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

METHOD BLANK: 219393 Matrix: Water
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Fuel Range	mg/L	ND	0.10	06/19/15 15:09	
Motor Oil Range	mg/L	ND	0.25	06/19/15 15:09	CL
n-Octacosane (S)	%.	115	70-130	06/19/15 15:09	

LABORATORY CONTROL SAMPLE: 219394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Fuel Range	mg/L	.88	0.76	87	70-130	
n-Octacosane (S)	%.			140	70-130	S0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 219395 219396

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Fuel Range	mg/L	3.3	.88	.87	3.8	4.3	54	111	70-130	12	25	M1
n-Octacosane (S)	%.						148	142	70-130			S5

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAVM/1529 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

METHOD BLANK: 217802 Matrix: Water
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethanol	ug/L	ND	5.0	06/11/15 01:06	
Methanol	ug/L	ND	50.0	06/11/15 01:06	
1,2-Dichloroethane-d4 (S)	%.	98	70-130	06/11/15 01:06	

LABORATORY CONTROL SAMPLE: 217803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethanol	ug/L	100	96.6	96	70-130	
Methanol	ug/L	1010	1060	105	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217804 217805

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethanol	ug/L	24.8	100	100	134	98.8	109	74	70-130	30	25	R1
Methanol	ug/L	93.2	1010	1010	3120	828	301	73	70-130	116	25	M1,R1
1,2-Dichloroethane-d4 (S)	%.						96	95	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAVM/1536 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

METHOD BLANK: 218177 Matrix: Water
Associated Lab Samples: 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	ND	0.50	06/11/15 21:30	
1,2-Dichloroethane	ug/L	ND	0.50	06/11/15 21:30	
Benzene	ug/L	ND	0.50	06/11/15 21:30	
Diisopropyl ether	ug/L	ND	0.50	06/11/15 21:30	
Ethyl-tert-butyl ether	ug/L	ND	0.50	06/11/15 21:30	
Ethylbenzene	ug/L	ND	0.50	06/11/15 21:30	
Methyl-tert-butyl ether	ug/L	ND	0.50	06/11/15 21:30	
Naphthalene	ug/L	ND	0.50	06/11/15 21:30	
tert-Amylmethyl ether	ug/L	ND	0.50	06/11/15 21:30	
tert-Butyl Alcohol	ug/L	ND	5.0	06/11/15 21:30	
Toluene	ug/L	ND	0.50	06/11/15 21:30	
Xylene (Total)	ug/L	ND	1.0	06/11/15 21:30	
1,2-Dichloroethane-d4 (S)	%.	113	70-130	06/11/15 21:30	
4-Bromofluorobenzene (S)	%.	90	70-130	06/11/15 21:30	
Toluene-d8 (S)	%.	102	70-130	06/11/15 21:30	

LABORATORY CONTROL SAMPLE: 218178

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	40	39.3	98	70-130	
1,2-Dichloroethane	ug/L	40	44.2	110	70-130	
Benzene	ug/L	40	43.5	109	70-130	
Diisopropyl ether	ug/L	40	39.6	99	70-130	
Ethyl-tert-butyl ether	ug/L	40	41.5	104	70-130	
Ethylbenzene	ug/L	40	40.1	100	70-130	
Methyl-tert-butyl ether	ug/L	40	44.1	110	70-130	
Naphthalene	ug/L	40	40.4	101	70-130	
tert-Amylmethyl ether	ug/L	40	41.0	103	70-130	
tert-Butyl Alcohol	ug/L	400	430	107	70-130	
Toluene	ug/L	40	41.9	105	70-130	
Xylene (Total)	ug/L	120	115	96	70-130	
1,2-Dichloroethane-d4 (S)	%.			112	70-130	
4-Bromofluorobenzene (S)	%.			93	70-130	
Toluene-d8 (S)	%.			101	70-130	

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218197 218198

Parameter	Units	1248161008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	40.9	37.2	102	93	70-130	10	25	
1,2-Dichloroethane	ug/L	ND	40	40	45.1	42.4	113	106	70-130	6	25	
Benzene	ug/L	ND	40	40	45.4	41.6	114	104	70-130	9	25	
Diisopropyl ether	ug/L	ND	40	40	41.2	38.1	103	95	70-130	8	25	
Ethyl-tert-butyl ether	ug/L	ND	40	40	42.9	39.8	107	99	70-130	8	25	
Ethylbenzene	ug/L	ND	40	40	39.8	36.7	100	92	70-130	8	25	
Methyl-tert-butyl ether	ug/L	ND	40	40	45.6	42.5	113	106	70-130	7	25	
Naphthalene	ug/L	ND	40	40	41.4	38.0	103	95	70-130	8	25	
tert-Amylmethyl ether	ug/L	ND	40	40	41.9	39.2	105	98	70-130	6	25	
tert-Butyl Alcohol	ug/L	ND	400	400	428	403	107	100	70-130	6	25	
Toluene	ug/L	ND	40	40	43.0	39.1	107	98	70-130	9	25	
Xylene (Total)	ug/L	ND	120	120	113	103	94	86	70-130	9	25	
1,2-Dichloroethane-d4 (S)	%.						115	112	70-130			
4-Bromofluorobenzene (S)	%.						98	90	70-130			
Toluene-d8 (S)	%.						101	100	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAVM/1537 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005

METHOD BLANK: 218199 Matrix: Water
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	ND	0.50	06/11/15 21:51	
1,2-Dichloroethane	ug/L	ND	0.50	06/11/15 21:51	
Benzene	ug/L	ND	0.50	06/11/15 21:51	
Diisopropyl ether	ug/L	ND	0.50	06/11/15 21:51	
Ethyl-tert-butyl ether	ug/L	ND	0.50	06/11/15 21:51	
Ethylbenzene	ug/L	ND	0.50	06/11/15 21:51	
Methyl-tert-butyl ether	ug/L	ND	0.50	06/11/15 21:51	
Naphthalene	ug/L	ND	0.50	06/11/15 21:51	
tert-Amylmethyl ether	ug/L	ND	0.50	06/11/15 21:51	
tert-Butyl Alcohol	ug/L	ND	5.0	06/11/15 21:51	
Toluene	ug/L	ND	0.50	06/11/15 21:51	
Xylene (Total)	ug/L	ND	1.0	06/11/15 21:51	
1,2-Dichloroethane-d4 (S)	%.	102	70-130	06/11/15 21:51	
4-Bromofluorobenzene (S)	%.	98	70-130	06/11/15 21:51	
Toluene-d8 (S)	%.	100	70-130	06/11/15 21:51	

LABORATORY CONTROL SAMPLE: 218200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	40	43.3	108	70-130	
1,2-Dichloroethane	ug/L	40	42.8	107	70-130	
Benzene	ug/L	40	42.7	107	70-130	
Diisopropyl ether	ug/L	40	40.1	100	70-130	
Ethyl-tert-butyl ether	ug/L	40	40.6	101	70-130	
Ethylbenzene	ug/L	40	40.3	101	70-130	
Methyl-tert-butyl ether	ug/L	40	40.7	102	70-130	
Naphthalene	ug/L	40	44.3	111	70-130	
tert-Amylmethyl ether	ug/L	40	39.6	99	70-130	
tert-Butyl Alcohol	ug/L	400	384	96	70-130	
Toluene	ug/L	40	41.2	103	70-130	
Xylene (Total)	ug/L	120	122	101	70-130	
1,2-Dichloroethane-d4 (S)	%.			102	70-130	
4-Bromofluorobenzene (S)	%.			99	70-130	
Toluene-d8 (S)	%.			101	70-130	

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218201 218202

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	43.2	42.8	108	107	70-130	1	25	
1,2-Dichloroethane	ug/L	ND	40	40	41.8	41.2	105	103	70-130	1	25	
Benzene	ug/L	ND	40	40	42.1	41.7	105	104	70-130	1	25	
Diisopropyl ether	ug/L	ND	40	40	40.2	39.9	100	100	70-130	1	25	
Ethyl-tert-butyl ether	ug/L	ND	40	40	40.6	40.2	102	100	70-130	1	25	
Ethylbenzene	ug/L	ND	40	40	40.4	39.5	101	99	70-130	2	25	
Methyl-tert-butyl ether	ug/L	ND	40	40	40.6	40.1	101	100	70-130	1	25	
Naphthalene	ug/L	0.51	40	40	45.7	45.5	113	113	70-130	0	25	
tert-Amylmethyl ether	ug/L	ND	40	40	38.6	38.3	97	96	70-130	1	25	
tert-Butyl Alcohol	ug/L	ND	400	400	390	378	97	94	70-130	3	25	
Toluene	ug/L	ND	40	40	40.9	40.7	102	102	70-130	0	25	
Xylene (Total)	ug/L	ND	120	120	121	119	101	99	70-130	2	25	
1,2-Dichloroethane-d4 (S)	%.						100	100	70-130			
4-Bromofluorobenzene (S)	%.						100	100	70-130			
Toluene-d8 (S)	%.						101	101	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAVM/1543 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water MSV
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

METHOD BLANK: 218418 Matrix: Water
Associated Lab Samples: 1248143001, 1248143002, 1248143003, 1248143004, 1248143005, 1248143006, 1248143007, 1248143008, 1248143009, 1248143010, 1248143011, 1248143012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	250	06/12/15 20:28	
1,2-Dichloroethane-d4 (S)	%.	98	70-130	06/12/15 20:28	
4-Bromofluorobenzene (S)	%.	92	70-130	06/12/15 20:28	
Toluene-d8 (S)	%.	100	70-130	06/12/15 20:28	

LABORATORY CONTROL SAMPLE: 218419

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TPH as Gas	ug/L	500	497	99	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	70-130	
4-Bromofluorobenzene (S)	%.			99	70-130	
Toluene-d8 (S)	%.			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218420 218421

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	ug/L	ND	500	500	592	573	111	107	70-130	3	25	
1,2-Dichloroethane-d4 (S)	%.						98	96	70-130			
4-Bromofluorobenzene (S)	%.						99	100	70-130			
Toluene-d8 (S)	%.						101	101	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

QC Batch: DAWT/1175 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 1248143001, 1248143004, 1248143006, 1248143009

METHOD BLANK: 216956 Matrix: Water
Associated Lab Samples: 1248143001, 1248143004, 1248143006, 1248143009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	0.50	06/08/15 19:25	

LABORATORY CONTROL SAMPLE: 216957

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	25	25.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 216958 216959

Parameter	Units	1248144001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	456	25	25	476	474	80	71	80-120	0	20	M6

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis

ANALYTE QUALIFIERS

1V	The detection for Methanol likely is biased high due to the presence of interfering compounds.
CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248143001	C-MW-02-0615	EPA 200.7	DAMP/1238	EPA 200.7	DAMT/1237
1248143004	C-MW-06-0615	EPA 200.7	DAMP/1238	EPA 200.7	DAMT/1237
1248143006	C-MW-08-0615	EPA 200.7	DAMP/1238	EPA 200.7	DAMT/1237
1248143009	C-MW-12-0615	EPA 200.7	DAMP/1238	EPA 200.7	DAMT/1237
1248143001	C-MW-02-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143002	C-MW-03-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143003	C-MW-04-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143004	C-MW-06-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143005	C-MW-07-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143006	C-MW-08-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143007	C-MW-10-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143008	C-MW-11-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143009	C-MW-12-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143010	C-MW-12D-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143011	C-MW-14-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143012	C-EB-0615	EPA 3510	DAOP/1206	NWTPH-Dx	DASG/1206
1248143001	C-MW-02-0615	EPA 8260B	DAVM/1529		
1248143002	C-MW-03-0615	EPA 8260B	DAVM/1529		
1248143003	C-MW-04-0615	EPA 8260B	DAVM/1529		
1248143004	C-MW-06-0615	EPA 8260B	DAVM/1529		
1248143005	C-MW-07-0615	EPA 8260B	DAVM/1529		
1248143006	C-MW-08-0615	EPA 8260B	DAVM/1529		
1248143007	C-MW-10-0615	EPA 8260B	DAVM/1529		
1248143008	C-MW-11-0615	EPA 8260B	DAVM/1529		
1248143009	C-MW-12-0615	EPA 8260B	DAVM/1529		
1248143010	C-MW-12D-0615	EPA 8260B	DAVM/1529		
1248143011	C-MW-14-0615	EPA 8260B	DAVM/1529		
1248143012	C-EB-0615	EPA 8260B	DAVM/1529		
1248143001	C-MW-02-0615	EPA 8260B	DAVM/1537		
1248143002	C-MW-03-0615	EPA 8260B	DAVM/1537		
1248143003	C-MW-04-0615	EPA 8260B	DAVM/1537		
1248143004	C-MW-06-0615	EPA 8260B	DAVM/1537		
1248143005	C-MW-07-0615	EPA 8260B	DAVM/1537		
1248143006	C-MW-08-0615	EPA 8260B	DAVM/1536		
1248143007	C-MW-10-0615	EPA 8260B	DAVM/1536		
1248143008	C-MW-11-0615	EPA 8260B	DAVM/1536		
1248143009	C-MW-12-0615	EPA 8260B	DAVM/1536		
1248143010	C-MW-12D-0615	EPA 8260B	DAVM/1536		
1248143011	C-MW-14-0615	EPA 8260B	DAVM/1536		
1248143012	C-EB-0615	EPA 8260B	DAVM/1536		
1248143001	C-MW-02-0615	NWTPH-Gx	DAVM/1543		
1248143002	C-MW-03-0615	NWTPH-Gx	DAVM/1543		
1248143003	C-MW-04-0615	NWTPH-Gx	DAVM/1543		
1248143004	C-MW-06-0615	NWTPH-Gx	DAVM/1543		
1248143005	C-MW-07-0615	NWTPH-Gx	DAVM/1543		
1248143006	C-MW-08-0615	NWTPH-Gx	DAVM/1543		

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248143

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248143007	C-MW-10-0615	NWTPH-Gx	DAVM/1543		
1248143008	C-MW-11-0615	NWTPH-Gx	DAVM/1543		
1248143009	C-MW-12-0615	NWTPH-Gx	DAVM/1543		
1248143010	C-MW-12D-0615	NWTPH-Gx	DAVM/1543		
1248143011	C-MW-14-0615	NWTPH-Gx	DAVM/1543		
1248143012	C-EB-0615	NWTPH-Gx	DAVM/1543		
1248143001	C-MW-02-0615	EPA 300.0	DAWT/1175		
1248143004	C-MW-06-0615	EPA 300.0	DAWT/1175		
1248143006	C-MW-08-0615	EPA 300.0	DAWT/1175		
1248143009	C-MW-12-0615	EPA 300.0	DAWT/1175		

Pace Analytical

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Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. WMAS pdw 1248143

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Chain-of-Custody Record and Analysis Request

Send Report To: Jeff Hennier - jhennier@azureenvironmental.com	Electronic Data Deliverable (EDD): ☐ CA EDF ☐ CA WriteOn ☑ WA EIM ☐ Excel ☐ EQuIS _____ ☐ Other _____
Company: Azure Environmental	
Address: 769 Center Blvd., #123 Fairfax, CA 94930	User Location ID: CPL Pasco Bulk Terminal
	User Study ID: AO7294
TEL: (415) 497-2918 FAX: MBL: (415) 497-2918	EDD Deliverable To (Email Address): jhennier@azureenvironmental.com
Project #: 1906-PASCO P.O. #:	Sampling Company: Azure Environmental Sampler Signature:
Project Name: Pasco WA Bulk Terminal	Invoice To: Jeff Baker at Tesoro Logistics, LLC

Project Address: 2900 Sacajawea Park Road Pasco, WA 99301

Sample ID	Location ID	Sampling Date	Sampling Time	# of Containers: 40 ml VOA	Sleeve	Poly	Glass	Tedlar	# Preserved: HCl	HNO_3	None	Matrix: Water	Soil	Vapor	Other (specify)	TPH: NWTPH-Gx	NWTPH-Dx w/silica gel; Diesel range and Motor Oil rang	Other (specify):	8260B: BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates: MTBE	DIPE	ETBE	TAME	TBA	7 Oxygenates (5 Oxygenates plus): Ethanol	Methanol	Lead Scavengers: 1,2 DCA	1,2 EDB	Halogenated Volatile Organic Compounds (former 8010 list)	Naphthalene	524: Volatile Organics by EPA Method 524.2	Metals: Metals Group (Method: ____) ☐ CAM 17 ☐ LUFT	Individual Metals (list and enter method):	SHORT HOLD: ☐ Nitrate as N ☐ Nitrite as N ☐ Ferrous Iron	☐ Nitrate as NO_3 ☐ Nitrite as NO_2	Chromium VI by (circle one: EPA 7199 EPA 7196) (EPA 7196 is to be deled)	Other: Methane	Sulfate	Dissolved Manganese	Alkalinity	MS/MSD	For Lab Use Only
C-MW-02-0615	AO7294_MW-02	6/4/15	10:25	8		3			8		3	X				X	X		X			X	X		X	X									X	X	X	X		001
C-MW-03-0615	AO7294_MW-03	↓	14:40	18					18			X				X	X		X			X	X		X	X													X	002
C-MW-04-0615	AO7294_MW-04	6/3/15	9:50	6					6			X				X	X		X			X	X		X	X														003
C-MW-06-0615	AO7294_MW-06		17:25	8		3			8		3	X				X	X		X			X	X		X	X									X	X	X	X		004
C-MW-07-0615	AO7294_MW-07		11:18	6					6			X				X	X		X			X	X		X	X														005
C-MW-08-0615	AO7294_MW-08		16:15	8		3			8		3	X				X	X		X			X	X		X	X									X	X	X	X		006
C-MW-10-0615	AO7294_MW-10	↓	14:55	6					6			X				X	X		X			X	X		X	X														007
C-MW-11-0615	AO7294_MW-11	6/4/15	11:43	6					6			X				X	X		X			X	X		X	X														008
C-MW-12-0615	AO7294_MW-12		13:25	8		3			8		3	X				X	X		X			X	X		X	X									X	X	X	X		009
C-MW-12D-0615	AO7294_MW-12	↓	13:25	6					6			X				X	X		X			X	X		X	X														010

Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
	6/4/15 16:00	FedEX - Pasco	6/4/15 16:00
Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
		Pace Analytical	060515 0955
Relinquished by (signature/affiliation)	Date & Time	Received by Pace Analytical (signature)	Date & Time

Remarks and Special Instructions (composite, filter, MS/MSD, return samples, Silica Gel, etc.):
See modifications to Analysis Request

Turnaround Time (TAT - Circle One): {Note 72-Hour Hold Time}
(Standard) 4-Day 3-Day 2-Day 1-Day Other: _____
TAT in business days. Surcharge may apply. TAT for subcontracted work may vary. Advance notice to Pace of your sampling event is recommended or Short Hold or expedited TAT cannot be guaranteed.

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Pace Analytical

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Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 1248143

Page 2 of 3

Chain-of-Custody Record and Analysis Request

Send Report To: Jeff Hennier - jhennier@azureenvironmental.com
Company: Azure Environmental
Address: 769 Center Blvd., #123, Fairfax, CA 94930
TEL: (415) 497-2918 FAX:
MBL: (415) 497-2918
Project #: 1906-PASCO P.O. #:
Project Name: Pasco WA Bulk Terminal

Electronic Data Deliverable (EDD): ☐ CA EDF ☐ CA WriteOn ☑ WA EIM ☐ Excel ☐ EQuIS _____ ☐ Other _____
User Location ID: CPL Pasco Bulk Terminal
User Study ID: AO7294
EDD Deliverable To (Email Address): jhennier@azureenvironmental.com
Sampling Company: Azure Environmental
Sampler Signature:
Invoice To: Jeff Baker at Tesoro Logistics, LLC

Project Address: 2900 Sacajawea Park Road, Pasco, WA 99301

Sample ID	Location ID	Sampling: Date	Sampling: Time	# of Containers: 40 ml VOA	Sleeve	Poly	Glass	Tedlar	# Preserved: HCl	HNO_3	None			Matrix: Water	Soil	Vapor	Other (specify)	TPH: NWTPH-Gx	NWTPH-Dx w/silica gel; Diesel range and Motor Oil rang	Other (specify):	8260B: BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates: MTBE	DIPE	ETBE	TAME	TBA	7 Oxygenates (5 Oxygenates plus): Ethanol	Methanol	Lead Scavengers: 1,2 DCA	1,2 EDB	Halogenated Volatile Organic Compounds (former 8010 list)	Naphthalene	524: Volatile Organics by EPA Method 524.2	Metals: Metals Group (Method:) ☐ CAM 17 ☐ LUFT	Individual Metals (list and enter method):	SHORT HOLD: ☐ Nitrate as N ☐ Nitrite as N ☐ Ferrous Iron	☐ Nitrate as NO_3 ☐ Nitrite as NO_2	Chromium VI by (circle one: EPA 7199 EPA 7196) EPA 7199 is the default	Other: Methane	Sulfate	Dissolved Manganese	Alkalinity	MS/MSD	For Lab Use Only
C-MW-14-0615	AO7294_MW-14	6/4/15	9:00	6					6					X				X	X		X						X		X	X		X													611
C-EB-0615	—	↓	7:15	6					6					X				X	X		X						X		X	X		X													612

Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
	6/4/15 16:00	FedEx Pasco	6/4/15 16:00
		PACE	06/05/15 0955
		Received by Pace Analytical (signature):	

Remarks and Special Instructions (composite, filter, MS/MSD, return samples, Silica Gel, etc.):
See modifications to Analysis Request

Turnaround Time (TAT - Circle One): {Note 72-Hour Hold Time}
(Standard) 4-Day 3-Day 2-Day 1-Day Other: _____
TAT in business days. Surcharge may apply. TAT for subcontracted work may vary. Advance notice to Pace of your sampling event is recommended or Short Hold or expedited TAT cannot be guaranteed.

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Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: F-DAV-C-002-rev.02	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt

Client Name: Azure

Project #: WO# : 1248143

1248143

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ OnTrac ☐ Other:

Tracking Number: 8071 1280 9347

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other: **Temp Blank?** ☐ Yes ☒ No

Thermom. Used: ☒ DA1434 ☐ DA2285 **Type of Ice:** ☒ Wet ☐ Blue ☐ Dry Ice ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read(°C): 1.8 **Cooler Temp Corrected(°C):** 1.8

Temp should be above freezing to 6°C **Correction Factor:**

Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Date and Initials of Person Examining Contents: 060515

				Comments:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1. Cx indicates 8 HCl
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2. preserved vials an
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3. Samples 001, 004, 006,
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4. 009. (6 HCl) and 2
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5. unpreserved vials were
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6. received.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☒ No	☐ N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC?	☐ Yes	☒ No	☐ N/A	12. Sample 002 has a date of 6/3/15
-Includes Date/Time/ID/Analysis Matrix: WT				on the containers.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☒ N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☒ Yes	☐ No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☒ No	☐ N/A	14.
Trip Blank Present?	☐ Yes	☒ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Scott Rens **Date:** 6/22/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

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WORK ORDER NUMBER: 15-06-0589

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Pace Analytical

Client Project Name: Pasco WA Bulk Terminal

Attention: Troy Turpen
2795 2nd Street, Suite 300
Davis, CA 95618-6505

Amanda Porter

Approved for release on 06/12/2015 by:
Amanda Porter
Project Manager

ResultLink ▸

Email your PM ▸

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Contents

Client Project Name: Pasco WA Bulk Terminal
Work Order Number: 15-06-0589

1 Work Order Narrative. 3

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3.2 LCS/LCSD. 7

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Work Order Narrative

Work Order: 15-06-0589 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 06/06/15. They were assigned to Work Order 15-06-0589.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

Return to Contents

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Analytical Report

Pace Analytical
2795 2nd Street, Suite 300
Davis, CA 95618-6505

Date Received: 06/06/15
Work Order: 15-06-0589
Preparation: N/A
Method: RSK-175M
Units: ug/L

Project: Pasco WA Bulk Terminal

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-02-0615	**15-06-0589-1-A**	**06/04/15 10:25**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 14:12**	**150608L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	1.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-06-0615	**15-06-0589-2-A**	**06/03/15 17:25**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 14:48**	**150608L01**

Parameter	Result	RL	DF	Qualifiers
Methane	1.68	1.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-08-0615	**15-06-0589-3-A**	**06/03/15 16:15**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 16:01**	**150608L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	1.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-12-0615	**15-06-0589-4-A**	**06/04/15 13:25**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 16:31**	**150608L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	1.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-663-2425**	**N/A**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 13:03**	**150608L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	1.00	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Pace Analytical
2795 2nd Street, Suite 300
Davis, CA 95618-6505

Date Received: 06/06/15
Work Order: 15-06-0589
Preparation: N/A
Method: SM 2320B
Units: mg/L

Project: Pasco WA Bulk Terminal

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-02-0615	**15-06-0589-1-C**	**06/04/15 10:25**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Result	RL	DF	Qualifiers
Alkalinity, Total (as CaCO3)	558	5.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-06-0615	**15-06-0589-2-C**	**06/03/15 17:25**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Result	RL	DF	Qualifiers
Alkalinity, Total (as CaCO3)	169	5.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-08-0615	**15-06-0589-3-C**	**06/03/15 16:15**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Result	RL	DF	Qualifiers
Alkalinity, Total (as CaCO3)	185	5.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
C-MW-12-0615	**15-06-0589-4-C**	**06/04/15 13:25**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Result	RL	DF	Qualifiers
Alkalinity, Total (as CaCO3)	312	5.00	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-859-727**	**N/A**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Result	RL	DF	Qualifiers
Alkalinity, Total (as CaCO3)	ND	1.0	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Sample Duplicate

Pace Analytical		Date Received:	06/06/15
2795 2nd Street, Suite 300		Work Order:	15-06-0589
Davis, CA 95618-6505		Preparation:	N/A
		Method:	SM 2320B
Project: Pasco WA Bulk Terminal			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
15-06-0650-1	**Sample**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKD1**
15-06-0650-1	**Sample Duplicate**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKD1**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	286.0	284.0	1	0-25	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Pace Analytical
2795 2nd Street, Suite 300
Davis, CA 95618-6505

Project: Pasco WA Bulk Terminal

Date Received: 06/06/15
Work Order: 15-06-0589
Preparation: N/A
Method: RSK-175M

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-663-2425	**LCS**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 12:05**	**150608L01**
099-12-663-2425	**LCSD**	**Aqueous**	**GC 52**	**N/A**	**06/08/15 12:34**	**150608L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	102.0	98.76	97	98.39	96	80-120	0	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Pace Analytical	Date Received: 06/06/15
2795 2nd Street, Suite 300	Work Order: 15-06-0589
Davis, CA 95618-6505	Preparation: N/A
	Method: SM 2320B
Project: Pasco WA Bulk Terminal	Page 2 of 2

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-859-727	**LCS**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**
099-15-859-727	**LCSD**	**Aqueous**	**PH1/BUR03**	**N/A**	**06/10/15 19:58**	**F0610ALKB1**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Alkalinity, Total (as CaCO3)	100.0	98.00	98	100.0	100	80-120	2	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

7440 Lincoln Way, Garden Grove, CA 92841-1427 • TEL: (714) 895-5494 • FAX: (714) 894-7501

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Sample Analysis Summary Report

Work Order: 15-06-0589 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
RSK-175M	N/A	1008	GC 52	2
SM 2320B	N/A	688	PH1/BUR03	1

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Glossary of Terms and Qualifiers

Work Order: 15-06-0589

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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Chain of Custody

Pace Analytical
www.pacelabs.com

15-06-0589

Workorder: 1248143 **Workorder Name:** Pasco WA Bulk Terminal **Results Requested** 6/12/2015

Report / Invoice To	Subcontract To
Scott M Forbes Pace Analytical Davis 2795 Second Street Suite 300 Davis, CA 95618 Phone (530) 297-4800 Email: scott.forbes@pacelabs.com	CSE P.O. 1248143

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Unpreserved	Methane by RSK175	Alkalinity													LAB USE ONLY
1	C-MW-02-0615	6/4/2015 10:25	1248143001	Water	3	X	X													
2	C-MW-06-0615	6/3/2015 17:25	1248143004	Water	3	X	X													
3	C-MW-08-0615	6/3/2015 16:15	1248143006	Water	3															
4	C-MW-12-0615	6/4/2015 13:25	1248143009	Water	3															
5																				

Transfers	Released By	Date/Time	Received By	Date/Time
1	PACE Analytical	6/5/15 1600		
2			EG	6/6/15 1300
3				

Comments: Need WA EIM edd

AL 6/6/15 1235

Cooler Temperature on Receipt °C | Custody Seal Y or N | Received on Ice Y or N | Samples Intact Y or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.*
This chain of custody is considered complete as is since this information is available in the owner laboratory.

01-89

OnTrac
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800.334.5000
ontrac.com

D10010796507239

Date Printed 6/5/2015

Tracking#D10010796507239

Shipped From:
PACE ANALYTICAL
2795 2ND STREET 300
DAVIS, CA 95618

Sent By: SAMPLE RECEIVINGX125
Phone#: (530)297-4800
wgt(lbs): 7
Reference: SUBS
Reference 2: 600

Ship To Company:	*Service:* **G**
CALSCIENCE ENVIRONMENTAL LABS **7440 LINCOLN WAY** **GARDEN GROVE, CA 92841** **SAMPLE RECEIVING (714)895-5494**	*Sort Code:* **ORG** *Special Services:* **Saturday Delivery** **Signature Required**

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WORK ORDER NUMBER: 15-06- 0599

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: Pace

DATE: 06 / 06 / 2015

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC2 (CF:-0.3°C); Temperature (w/o CF): 3.5 °C (w/ CF): 3.2 °C; ☑ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter Checked by: SR

CUSTODY SEAL:

Cooler ☑ Present and Intact ☐ Present but Not Intact ☐ Not Present ☐ N/A Checked by: SR

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 778

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☐	☐	☑
Sample container label(s) consistent with COC	☐	☑	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☑	☐	☐
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Container(s) for certain analysis free of headspace	☑	☐	☐
☐ Volatile Organics ☑ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☑ VOAh ☐ VOAna_2 ☐ 100PJ ☐ 100PJna_2 ☐ 125AGB ☐ 125AGBh ☐ 125AGBp ☐ 125PB

☐ 125PBznna ☐ 250AGB ☐ 250CGB ☐ 250CGBs ☑ 250PB ☐ 250PBn ☐ 500AGB ☐ 500AGJ ☐ 500AGJs

☐ 500PB ☐ 1AGB ☐ 1AGBna_2 ☐ 1AGBs ☐ 1PB ☐ 1PBna ☐ _____ ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® (_____) ☐ TerraCores® (_____) ☐ _____

Air: ☐ Tedlar™ ☐ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na_2** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **znna** = $Zn(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: 778

Reviewed by: 681

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WORK ORDER NUMBER: 15-06- 0589

SAMPLE ANOMALY REPORT

DATE: 06 / 06 / 2015

SAMPLES, CONTAINERS, AND LABELS:

- ☐ Sample(s) NOT RECEIVED but listed on COC
- ☐ Sample(s) received but NOT LISTED on COC
- ☐ Holding time expired (list client or ECI sample ID and analysis)
- ☐ Insufficient sample amount for requested analysis (list analysis)
- ☐ Improper container(s) used (list analysis)
- ☐ Improper preservative used (list analysis)
- ☐ No preservative noted on COC or label (list analysis and notify lab)
- ☐ Sample container(s) not labeled
- ☐ Client sample label(s) illegible (list container type and analysis)
- ☐ Client sample label(s) do not match COC (comment)
  - ☐ Project information
  - ☐ Client sample ID
  - ☐ Sampling date and/or time
  - ☐ Number of container(s)
  - ☐ Requested analysis
- ☐ Sample container(s) compromised (comment)
  - ☐ Broken
  - ☐ Water present in sample container
- ☐ Air sample container(s) compromised (comment)
  - ☐ Flat
  - ☐ Very low in volume
  - ☐ Leaking (not transferred; duplicate bag submitted)
  - ☐ Leaking (transferred into ECI Tedlar™ bags*)
  - ☐ Leaking (transferred into client's Tedlar™ bags*)

* Transferred at client's request.

Comments

(1) to (4) all vials for R.Sk per COC : unpreserved. per label : HCL.

MISCELLANEOUS: (Describe)

Preservative note.

Comments

HEADSPACE:

(Containers with bubble > 6 mm or ¼ inch for volatile organic or dissolved gas analysis)

ECI Sample ID	ECI Container ID	Total Number**	ECI Sample ID	ECI Container ID	Total Number**

(Containers with bubble for other analysis)

ECI Sample ID	ECI Container ID	Total Number**	Requested Analysis

Comments: _____

Reported by: TH

** Record the total number of containers (i.e., vials or bottles) for the affected sample.

Reviewed by: 681.

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Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

June 18, 2015

Jeff Hennier
Azure Environmental
769 Center Boulevard
123
Fairfax, CA 94930

RE: Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Dear Jeff Hennier:
Enclosed are the analytical results for sample(s) received by the laboratory on June 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Troy G. Turpen

Troy G Turpen for
Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

CERTIFICATIONS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Davis Cerification IDs
2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-14a
California Certification #: 08263CA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

SAMPLE SUMMARY

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1248103001	C-CB1-water	Water	06/01/15 15:15	06/04/15 11:55
1248103002	C-CB2-water	Water	06/02/15 12:40	06/04/15 11:55
1248103003	C-CB2-water2	Water	06/02/15 14:15	06/04/15 11:55

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SAMPLE ANALYTE COUNT

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1248103001	**C-CB1-water**	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248103002	**C-CB2-water**	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248103003	**C-CB2-water2**	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Sample: C-CB1-water **Lab ID: 1248103001** Collected: 06/01/15 15:15 Received: 06/04/15 11:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**2.4**	mg/L	0.10	1	06/09/15 20:12	06/11/15 23:44		DM
Motor Oil Range	**3.9**	mg/L	0.25	1	06/09/15 20:12	06/11/15 23:44		CL
Surrogates								
n-Octacosane (S)	99	%.	70-130	1	06/09/15 20:12	06/11/15 23:44	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	**18.5**	ug/L	5.0	1		06/11/15 02:55	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 02:55	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/11/15 02:55	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/10/15 22:53	1634-04-4	
Benzene	ND	ug/L	0.50	1		06/10/15 22:53	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/10/15 22:53	107-06-2	
Toluene	ND	ug/L	0.50	1		06/10/15 22:53	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/10/15 22:53	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/10/15 22:53	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/10/15 22:53	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/10/15 22:53	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/10/15 22:53	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/10/15 22:53	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/10/15 22:53	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/10/15 22:53	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	70-130	1		06/10/15 22:53	17060-07-0	
Toluene-d8 (S)	88	%.	70-130	1		06/10/15 22:53	2037-26-5	
4-Bromofluorobenzene (S)	92	%.	70-130	1		06/10/15 22:53	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/12/15 23:10		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/12/15 23:10	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 23:10	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1		06/12/15 23:10	460-00-4	

Sample: C-CB2-water **Lab ID: 1248103002** Collected: 06/02/15 12:40 Received: 06/04/15 11:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**3.1**	mg/L	0.10	1	06/09/15 20:12	06/12/15 00:13		DM
Motor Oil Range	**4.6**	mg/L	0.25	1	06/09/15 20:12	06/12/15 00:13		CL
Surrogates								
n-Octacosane (S)	103	%.	70-130	1	06/09/15 20:12	06/12/15 00:13	630-02-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Sample: C-CB2-water **Lab ID: 1248103002** Collected: 06/02/15 12:40 Received: 06/04/15 11:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	ND	ug/L	5.0	1		06/11/15 03:31	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 03:31	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	1		06/11/15 03:31	17060-07-0	
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/10/15 23:41	1634-04-4	
Benzene	**0.67**	ug/L	0.50	1		06/10/15 23:41	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/10/15 23:41	107-06-2	
Toluene	ND	ug/L	0.50	1		06/10/15 23:41	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/10/15 23:41	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/10/15 23:41	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/10/15 23:41	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/10/15 23:41	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/10/15 23:41	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/10/15 23:41	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/10/15 23:41	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/10/15 23:41	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	117	%.	70-130	1		06/10/15 23:41	17060-07-0	
Toluene-d8 (S)	84	%.	70-130	1		06/10/15 23:41	2037-26-5	
4-Bromofluorobenzene (S)	90	%.	70-130	1		06/10/15 23:41	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/12/15 23:37		
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	1		06/12/15 23:37	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/12/15 23:37	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1		06/12/15 23:37	460-00-4	

Sample: C-CB2-water2 **Lab ID: 1248103003** Collected: 06/02/15 14:15 Received: 06/04/15 11:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS, Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3510							
Diesel Fuel Range	**1.2**	mg/L	0.10	1	06/09/15 20:12	06/12/15 00:42		DM
Motor Oil Range	**1.7**	mg/L	0.25	1	06/09/15 20:12	06/12/15 00:42		CL
Surrogates								
n-Octacosane (S)	93	%.	70-130	1	06/09/15 20:12	06/12/15 00:42	630-02-4	
8260 MSV	Analytical Method: EPA 8260B							
Ethanol	**17.3**	ug/L	5.0	1		06/11/15 04:08	64-17-5	
Methanol	ND	ug/L	50.0	1		06/11/15 04:08	67-56-1	
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	1		06/11/15 04:08	17060-07-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Sample: C-CB2-water2 **Lab ID: 1248103003** Collected: 06/02/15 14:15 Received: 06/04/15 11:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B							
Methyl-tert-butyl ether	ND	ug/L	0.50	1		06/11/15 00:10	1634-04-4	
Benzene	**0.53**	ug/L	0.50	1		06/11/15 00:10	71-43-2	
1,2-Dichloroethane	ND	ug/L	0.50	1		06/11/15 00:10	107-06-2	
Toluene	ND	ug/L	0.50	1		06/11/15 00:10	108-88-3	
1,2-Dibromoethane (EDB)	ND	ug/L	0.50	1		06/11/15 00:10	106-93-4	
Ethylbenzene	ND	ug/L	0.50	1		06/11/15 00:10	100-41-4	
Xylene (Total)	ND	ug/L	1.0	1		06/11/15 00:10	1330-20-7	
Diisopropyl ether	ND	ug/L	0.50	1		06/11/15 00:10	108-20-3	
Ethyl-tert-butyl ether	ND	ug/L	0.50	1		06/11/15 00:10	637-92-3	
tert-Amylmethyl ether	ND	ug/L	0.50	1		06/11/15 00:10	994-05-8	
tert-Butyl Alcohol	ND	ug/L	5.0	1		06/11/15 00:10	75-65-0	
Naphthalene	ND	ug/L	0.50	1		06/11/15 00:10	91-20-3	
Surrogates								
1,2-Dichloroethane-d4 (S)	117	%.	70-130	1		06/11/15 00:10	17060-07-0	
Toluene-d8 (S)	86	%.	70-130	1		06/11/15 00:10	2037-26-5	
4-Bromofluorobenzene (S)	91	%.	70-130	1		06/11/15 00:10	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx							
TPH as Gas	ND	ug/L	250	1		06/13/15 00:04		
Surrogates								
1,2-Dichloroethane-d4 (S)	94	%.	70-130	1		06/13/15 00:04	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1		06/13/15 00:04	2037-26-5	
4-Bromofluorobenzene (S)	100	%.	70-130	1		06/13/15 00:04	460-00-4	

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

QC Batch: DAOP/1182 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3510 Analysis Description: NWTPH-Dx GCS, Silica Gel
Associated Lab Samples: 1248103001, 1248103002, 1248103003

METHOD BLANK: 217292 Matrix: Water
Associated Lab Samples: 1248103001, 1248103002, 1248103003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Fuel Range	mg/L	ND	0.10	06/11/15 15:51	
Motor Oil Range	mg/L	ND	0.25	06/11/15 15:51	
n-Octacosane (S)	%.	97	70-130	06/11/15 15:51	

LABORATORY CONTROL SAMPLE: 217293

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Fuel Range	mg/L	.88	0.71	81	70-130	
n-Octacosane (S)	%.			109	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217294 217295

Parameter	Units	1248103001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Fuel Range	mg/L	2.4	.89	.89	11.6	4.5	1030	236	70-130	89	25	M3,R2
n-Octacosane (S)	%.						112	17	70-130			S5

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

QC Batch: DAVM/1529 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV
Associated Lab Samples: 1248103001, 1248103002, 1248103003

METHOD BLANK: 217802 Matrix: Water
Associated Lab Samples: 1248103001, 1248103002, 1248103003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethanol	ug/L	ND	5.0	06/11/15 01:06	
Methanol	ug/L	ND	50.0	06/11/15 01:06	
1,2-Dichloroethane-d4 (S)	%.	98	70-130	06/11/15 01:06	

LABORATORY CONTROL SAMPLE: 217803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethanol	ug/L	100	96.6	96	70-130	
Methanol	ug/L	1010	1060	105	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217804 217805

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Ethanol	ug/L	24.8	100	100	134	98.8	109	74	70-130	30	25	R1
Methanol	ug/L	93.2	1010	1010	3120	828	301	73	70-130	116	25	M1,R1
1,2-Dichloroethane-d4 (S)	%.						96	95	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

QC Batch: DAVM/1530 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 1248103001, 1248103002, 1248103003

METHOD BLANK: 217811 Matrix: Water
Associated Lab Samples: 1248103001, 1248103002, 1248103003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	ND	0.50	06/10/15 20:21	
1,2-Dichloroethane	ug/L	ND	0.50	06/10/15 20:21	
Benzene	ug/L	ND	0.50	06/10/15 20:21	
Diisopropyl ether	ug/L	ND	0.50	06/10/15 20:21	
Ethyl-tert-butyl ether	ug/L	ND	0.50	06/10/15 20:21	
Ethylbenzene	ug/L	ND	0.50	06/10/15 20:21	
Methyl-tert-butyl ether	ug/L	ND	0.50	06/10/15 20:21	
Naphthalene	ug/L	ND	0.50	06/10/15 20:21	
tert-Amylmethyl ether	ug/L	ND	0.50	06/10/15 20:21	
tert-Butyl Alcohol	ug/L	ND	5.0	06/10/15 20:21	
Toluene	ug/L	ND	0.50	06/10/15 20:21	
Xylene (Total)	ug/L	ND	1.0	06/10/15 20:21	
1,2-Dichloroethane-d4 (S)	%.	116	70-130	06/10/15 20:21	
4-Bromofluorobenzene (S)	%.	91	70-130	06/10/15 20:21	
Toluene-d8 (S)	%.	100	70-130	06/10/15 20:21	

LABORATORY CONTROL SAMPLE: 217812

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/L	40	40.3	101	70-130	
1,2-Dichloroethane	ug/L	40	46.4	116	70-130	
Benzene	ug/L	40	44.6	111	70-130	
Diisopropyl ether	ug/L	40	40.4	101	70-130	
Ethyl-tert-butyl ether	ug/L	40	42.3	106	70-130	
Ethylbenzene	ug/L	40	39.7	99	70-130	
Methyl-tert-butyl ether	ug/L	40	44.4	111	70-130	
Naphthalene	ug/L	40	41.9	105	70-130	
tert-Amylmethyl ether	ug/L	40	40.9	102	70-130	
tert-Butyl Alcohol	ug/L	400	429	107	70-130	
Toluene	ug/L	40	42.1	105	70-130	
Xylene (Total)	ug/L	120	116	96	70-130	
1,2-Dichloroethane-d4 (S)	%.			119	70-130	
4-Bromofluorobenzene (S)	%.			94	70-130	
Toluene-d8 (S)	%.			101	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217815 217816

Parameter	Units	1248161003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dibromoethane (EDB)	ug/L	ND	40	40	41.4	39.6	103	99	70-130	4	25	
1,2-Dichloroethane	ug/L	ND	40	40	47.2	45.9	118	115	70-130	3	25	
Benzene	ug/L	25.7	40	40	71.9	69.3	116	109	70-130	4	25	
Diisopropyl ether	ug/L	ND	40	40	41.8	40.8	104	101	70-130	2	25	
Ethyl-tert-butyl ether	ug/L	ND	40	40	43.7	42.3	108	105	70-130	3	25	
Ethylbenzene	ug/L	ND	40	40	40.4	38.7	101	97	70-130	4	25	
Methyl-tert-butyl ether	ug/L	51.4	40	40	101	96.8	124	114	70-130	4	25	
Naphthalene	ug/L	ND	40	40	42.2	41.2	106	103	70-130	3	25	
tert-Amylmethyl ether	ug/L	1.3	40	40	44.7	42.9	109	104	70-130	4	25	
tert-Butyl Alcohol	ug/L	7.5	400	400	411	416	101	102	70-130	1	25	
Toluene	ug/L	ND	40	40	43.7	41.8	109	105	70-130	4	25	
Xylene (Total)	ug/L	ND	120	120	116	112	97	93	70-130	4	25	
1,2-Dichloroethane-d4 (S)	%.						113	113	70-130			
4-Bromofluorobenzene (S)	%.						91	91	70-130			
Toluene-d8 (S)	%.						101	100	70-130			

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REPORT OF LABORATORY ANALYSIS

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(530) 297-4800

QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

QC Batch: DAVM/1543 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Water MSV
Associated Lab Samples: 1248103001, 1248103002, 1248103003

METHOD BLANK: 218418 Matrix: Water
Associated Lab Samples: 1248103001, 1248103002, 1248103003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	ug/L	ND	250	06/12/15 20:28	
1,2-Dichloroethane-d4 (S)	%.	98	70-130	06/12/15 20:28	
4-Bromofluorobenzene (S)	%.	92	70-130	06/12/15 20:28	
Toluene-d8 (S)	%.	100	70-130	06/12/15 20:28	

LABORATORY CONTROL SAMPLE: 218419

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TPH as Gas	ug/L	500	497	99	70-130	
1,2-Dichloroethane-d4 (S)	%.			99	70-130	
4-Bromofluorobenzene (S)	%.			99	70-130	
Toluene-d8 (S)	%.			102	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218420 218421

Parameter	Units	1248143002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	ug/L	ND	500	500	592	573	111	107	70-130	3	25	
1,2-Dichloroethane-d4 (S)	%.						98	96	70-130			
4-Bromofluorobenzene (S)	%.						99	100	70-130			
Toluene-d8 (S)	%.						101	101	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV	Pace Analytical Services - Davis

ANALYTE QUALIFIERS

CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
DM	Higher boiling hydrocarbons present, atypical for Diesel Fuel.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M3	Matrix spike recovery was outside laboratory control limits due to matrix interferences.
R1	RPD value was outside control limits.
R2	RPD value was outside control limits due to matrix interference
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248103

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248103001	C-CB1-water	EPA 3510	DAOP/1182	NWTPH-Dx	DASG/1175
1248103002	C-CB2-water	EPA 3510	DAOP/1182	NWTPH-Dx	DASG/1175
1248103003	C-CB2-water2	EPA 3510	DAOP/1182	NWTPH-Dx	DASG/1175
1248103001	C-CB1-water	EPA 8260B	DAVM/1529		
1248103002	C-CB2-water	EPA 8260B	DAVM/1529		
1248103003	C-CB2-water2	EPA 8260B	DAVM/1529		
1248103001	C-CB1-water	EPA 8260B	DAVM/1530		
1248103002	C-CB2-water	EPA 8260B	DAVM/1530		
1248103003	C-CB2-water2	EPA 8260B	DAVM/1530		
1248103001	C-CB1-water	NWTPH-Gx	DAVM/1543		
1248103002	C-CB2-water	NWTPH-Gx	DAVM/1543		
1248103003	C-CB2-water2	NWTPH-Gx	DAVM/1543		

Pace Analytical

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 1248103

Page 1 of 1

Chain-of-Custody Record and Analysis Request

Send Report To: Jeff Hennier - jhennier@azureenvironmental.com
Company: Azure Environmental
Address: 769 Center Blvd., #123, Fairfax, CA 94930
TEL: (415) 497-2918 FAX:
MBL: (415) 497-2918
Project #: 1906-PASCO
P.O. #:
Project Name: Pasco WA Bulk Terminal

Electronic Data Deliverable (EDD): ☐ CA EDF ☐ CA WriteOn ☑ WA EIM ☐ Excel ☐ EQuIS _____ ☐ Other _____
User Location ID: CPL Pasco Bulk Terminal
User Study ID: AO7294
EDD Deliverable To (Email Address): jhennier@azureenvironmental.com
Sampling Company: Azure Environmental
Sampler Signature:
Invoice To: Jeff Baker at Tesoro Logistics, LLC

Project Address: 2900 Sacajawea Park Road, Pasco, WA 99301

Sample ID	Location ID	Sampling: Date	Sampling: Time	# of Containers: 40 ml VOA	Sleeve	Poly	Glass	Tedlar	# Preserved: HCl	HNO_3	None	Matrix: Water	Soil	Vapor	Other (specify)	TPH: NWTPH-Gx	NWTPH-Dx w/silica gel: Diesel range and Motor Oil range	Other (specify):	8260B: BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates: MTBE DIPE ETBE TAME TBA	7 Oxygenates (5 Oxygenates plus): Ethanol Methanol	Lead Scavengers: 1,2 DCA 1,2 EDB	Halogenated Volatile Organic Compounds (former 8010 list)	Naphthalene	524: Volatile Organics by EPA Method 524.2	Metals: Metals Group (Method: ☐ CAM 17 ☐ LUFT 5)	Individual Metals (list and enter method):	SHORT HOLD: ☐ Nitrate as N ☐ Nitrite as N ☐ Ferrous Iron	☐ Nitrate as NO_3 ☐ Nitrite as NO_2	Chromium VI by (circle one: EPA 7199 EPA 7196) EPA 7199 is the default	Other: Methane	Sulfate	Dissolved Manganese	Alkalinity	MS/MSD	For Lab Use Only
C-CB1-water	AO7294_CB1	6/1/15	15:15	6					6			X				X	X		X			X	X		X											001
C-CB2-water	AO7294_CB2	6/2/15	12:40	6					6			X				X	X		X			X	X		X											002
C-CB2-water2	↓	↓	14:15	5					5			X				X	X		X			X	X		X											003

Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
	6/3/15 13:00	FedEx - Pasco	
Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
		Pace Analytical	060415 1155
Relinquished by (signature/affiliation)	Date & Time	Received by Pace Analytical (signature)	Date & Time

Remarks and Special Instructions (composite, filter, MS/MSD, return samples, Silica Gel, etc.):
See modifications to Analysis Request

Turnaround Time (TAT - Circle One): {Note 72-Hour Hold Time}
Standard 4-Day 3-Day 2-Day 1-Day Other: _____
TAT in business days. Surcharge may apply. TAT for subcontracted work may vary. Advance notice to Pace of your sampling event is recommended or Short Hold or expedited TAT cannot be guaranteed.

Distribution: Original - Lab; Copy - Originator
Rev. 120514

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: F-DAV-C-002-rev.02	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt

Client Name: Azure

Project #: WO# : 1248103

1248103

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ OnTrac ☐ Other:

Tracking Number: 8071 1280 9333

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☐ Yes ☑ No

Thermom. Used: ☑ DA1434 ☐ DA2285 **Type of Ice:** ☑ Wet ☐ Blue ☐ Dry Ice ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read(°C): 0.6 **Cooler Temp Corrected(°C):** 0.6 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0 **Date and Initials of Person Examining Contents:** GJ 060415

				Comments:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☑ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☑ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	7.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	8. Sample -003 has only 5 containers.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	9.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: WT	☑ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☑ N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☑ Yes	☐ No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☑ No	☐ N/A	14.
Trip Blank Present?	☐ Yes	☑ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Scott Tebbe **Date:** 6/9/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

June 22, 2015

Jeff Hennier
Azure Environmental
769 Center Boulevard
123
Fairfax, CA 94930

RE: Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Dear Jeff Hennier:
Enclosed are the analytical results for sample(s) received by the laboratory on June 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Scott Forbes

Scott M Forbes
scott.forbes@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

CERTIFICATIONS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Davis Cerification IDs
2795 Second Street Suite 300 Davis, CA 95618
North Dakota Certification #: R-214
Oregon Certification #: CA300002
Washington Certification #: C926-14a
California Certification #: 08263CA

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
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(530) 297-4800

SAMPLE SUMMARY

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Lab ID	Sample ID	Matrix	Date Collected	Date Received
1248107001	C-CB1-soil 10'	Solid	06/01/15 10:45	06/04/15 11:55
1248107002	C-CB1-soil 20'	Solid	06/01/15 11:50	06/04/15 11:55
1248107003	C-CB1-soil 30'	Solid	06/01/15 12:15	06/04/15 11:55
1248107004	C-CB1-soil 45'	Solid	06/01/15 12:50	06/04/15 11:55
1248107005	C-CB1-soil 55'	Solid	06/01/15 13:25	06/04/15 11:55
1248107006	C-CB1-soil 65'	Solid	06/01/15 14:20	06/04/15 11:55
1248107007	C-CB1-soil 75'	Solid	06/01/15 15:05	06/04/15 11:55
1248107008	C-CB1-soil 79'	Solid	06/01/15 15:10	06/04/15 11:55
1248107009	C-CB2-soil 15'	Solid	06/02/15 08:15	06/04/15 11:55
1248107010	C-CB2-soil 24'	Solid	06/02/15 08:40	06/04/15 11:55
1248107011	C-CB2-soil 35'	Solid	06/02/15 09:30	06/04/15 11:55
1248107012	C-CB2-soil 45'	Solid	06/02/15 10:00	06/04/15 11:55
1248107013	C-CB2-soil 55'	Solid	06/02/15 10:50	06/04/15 11:55
1248107014	C-CB2-soil 65'	Solid	06/02/15 11:30	06/04/15 11:55
1248107015	C-CB2-soil 75'	Solid	06/02/15 12:15	06/04/15 11:55
1248107016	C-CB2-soil 79'	Solid	06/02/15 12:20	06/04/15 11:55

Pace Analytical Services, Inc.
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SAMPLE ANALYTE COUNT

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
1248107001	C-CB1-soil 10'	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107002	C-CB1-soil 20'	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107003	C-CB1-soil 30'	NWTPH-Dx	SAC	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107004	C-CB1-soil 45'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107005	C-CB1-soil 55'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107006	C-CB1-soil 65'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107007	C-CB1-soil 75'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107008	C-CB1-soil 79'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107009	C-CB2-soil 15'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JMB	4	PASI-DAV
1248107010	C-CB2-soil 24'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107011	C-CB2-soil 35'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107012	C-CB2-soil 45'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107013	C-CB2-soil 55'	NWTPH-Dx	DRM	3	PASI-DAV

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SAMPLE ANALYTE COUNT

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 8260B	MJY	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107014	C-CB2-soil 65'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107015	C-CB2-soil 75'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV
1248107016	C-CB2-soil 79'	NWTPH-Dx	DRM	3	PASI-DAV
		EPA 8260B	JCP	15	PASI-DAV
		NWTPH-Gx	JCP	4	PASI-DAV

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 10' **Lab ID: 1248107001** Collected: 06/01/15 10:45 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/10/15 16:28	06/11/15 12:26		
Motor Oil Range	ND	mg/kg	9.9	1	06/10/15 16:28	06/11/15 12:26		
Surrogates								
n-Octacosane (S)	110	%.	70-130	1	06/10/15 16:28	06/11/15 12:26	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 21:47	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/10/15 21:47	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/10/15 21:47	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	06/09/15 23:08	06/10/15 21:47	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/10/15 21:47	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	247	50	06/11/15 21:39	06/12/15 02:03		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 02:03	17060-07-0	
Toluene-d8 (S)	95	%.	70-130	50	06/11/15 21:39	06/12/15 02:03	2037-26-5	
4-Bromofluorobenzene (S)	83	%.	70-130	50	06/11/15 21:39	06/12/15 02:03	460-00-4	

Sample: C-CB1-soil 20' **Lab ID: 1248107002** Collected: 06/01/15 11:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	**2.2**	mg/kg	1.0	1	06/10/15 16:28	06/11/15 12:55		DE
Motor Oil Range	ND	mg/kg	10	1	06/10/15 16:28	06/11/15 12:55		
Surrogates								
n-Octacosane (S)	109	%.	70-130	1	06/10/15 16:28	06/11/15 12:55	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	75-65-0	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 20' **Lab ID: 1248107002** Collected: 06/01/15 11:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/10/15 23:41	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/10/15 23:41	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	1	06/09/15 23:08	06/10/15 23:41	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	1	06/09/15 23:08	06/10/15 23:41	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/10/15 23:41	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	250	50	06/11/15 21:39	06/12/15 02:30		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	70-130	50	06/11/15 21:39	06/12/15 02:30	17060-07-0	
Toluene-d8 (S)	97	%.	70-130	50	06/11/15 21:39	06/12/15 02:30	2037-26-5	
4-Bromofluorobenzene (S)	81	%.	70-130	50	06/11/15 21:39	06/12/15 02:30	460-00-4	

Sample: C-CB1-soil 30' **Lab ID: 1248107003** Collected: 06/01/15 12:15 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/10/15 16:28	06/11/15 13:25		
Motor Oil Range	ND	mg/kg	9.9	1	06/10/15 16:28	06/11/15 13:25		
Surrogates								
n-Octacosane (S)	109	%.	70-130	1	06/10/15 16:28	06/11/15 13:25	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	994-05-8	
Benzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	106-93-4	
1,2-Dichloroethane	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	107-06-2	
Diisopropyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	108-20-3	
Ethylbenzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	91-20-3	
Toluene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 00:04	108-88-3	
Xylene (Total)	ND	ug/kg	9.8	1	06/09/15 23:08	06/11/15 00:04	1330-20-7	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 30' **Lab ID: 1248107003** Collected: 06/01/15 12:15 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/11/15 00:04	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 00:04	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 00:04	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	248	50	06/11/15 21:39	06/12/15 02:57		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	50	06/11/15 21:39	06/12/15 02:57	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	50	06/11/15 21:39	06/12/15 02:57	2037-26-5	
4-Bromofluorobenzene (S)	85	%.	70-130	50	06/11/15 21:39	06/12/15 02:57	460-00-4	

Sample: C-CB1-soil 45' **Lab ID: 1248107004** Collected: 06/01/15 12:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	**1.2**	mg/kg	0.99	1	06/10/15 16:28	06/11/15 13:54		DE
Motor Oil Range	ND	mg/kg	9.9	1	06/10/15 16:28	06/11/15 13:54		
Surrogates								
n-Octacosane (S)	98	%.	70-130	1	06/10/15 16:28	06/11/15 13:54	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:27	108-88-3	
Xylene (Total)	ND	ug/kg	10.0	1	06/09/15 23:08	06/11/15 00:27	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/11/15 00:27	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 00:27	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1	06/09/15 23:08	06/11/15 00:27	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	245	50	06/11/15 21:39	06/12/15 03:24		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	50	06/11/15 21:39	06/12/15 03:24	17060-07-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 45' **Lab ID: 1248107004** Collected: 06/01/15 12:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Surrogates								
Toluene-d8 (S)	101	%.	70-130	50	06/11/15 21:39	06/12/15 03:24	2037-26-5	
4-Bromofluorobenzene (S)	81	%.	70-130	50	06/11/15 21:39	06/12/15 03:24	460-00-4	

Sample: C-CB1-soil 55' **Lab ID: 1248107005** Collected: 06/01/15 13:25 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/10/15 16:28	06/11/15 14:23		
Motor Oil Range	ND	mg/kg	9.9	1	06/10/15 16:28	06/11/15 14:23		
Surrogates								
n-Octacosane (S)	102	%.	70-130	1	06/10/15 16:28	06/11/15 14:23	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 00:50	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/11/15 00:50	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 00:50	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 00:50	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 00:50	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	247	50	06/11/15 21:39	06/12/15 03:51		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	100	%.	70-130	50	06/11/15 21:39	06/12/15 03:51	17060-07-0	
Toluene-d8 (S)	113	%.	70-130	50	06/11/15 21:39	06/12/15 03:51	2037-26-5	
4-Bromofluorobenzene (S)	84	%.	70-130	50	06/11/15 21:39	06/12/15 03:51	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 65' **Lab ID: 1248107006** Collected: 06/01/15 14:20 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.98	1	06/10/15 16:28	06/11/15 14:53		
Motor Oil Range	ND	mg/kg	9.8	1	06/10/15 16:28	06/11/15 14:53		
Surrogates								
n-Octacosane (S)	108	%.	70-130	1	06/10/15 16:28	06/11/15 14:53	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:13	108-88-3	
Xylene (Total)	ND	ug/kg	10	1	06/09/15 23:08	06/11/15 01:13	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/11/15 01:13	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 01:13	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 01:13	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	249	50	06/11/15 21:39	06/12/15 04:18		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 04:18	17060-07-0	
Toluene-d8 (S)	103	%.	70-130	50	06/11/15 21:39	06/12/15 04:18	2037-26-5	
4-Bromofluorobenzene (S)	80	%.	70-130	50	06/11/15 21:39	06/12/15 04:18	460-00-4	

Sample: C-CB1-soil 75' **Lab ID: 1248107007** Collected: 06/01/15 15:05 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.98	1	06/10/15 16:28	06/11/15 15:22		
Motor Oil Range	ND	mg/kg	9.8	1	06/10/15 16:28	06/11/15 15:22		
Surrogates								
n-Octacosane (S)	114	%.	70-130	1	06/10/15 16:28	06/11/15 15:22	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	75-65-0	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 75' **Lab ID: 1248107007** Collected: 06/01/15 15:05 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:36	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/11/15 01:36	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 01:36	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 01:36	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 01:36	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	248	50	06/11/15 21:39	06/12/15 04:45		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	50	06/11/15 21:39	06/12/15 04:45	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	50	06/11/15 21:39	06/12/15 04:45	2037-26-5	
4-Bromofluorobenzene (S)	81	%.	70-130	50	06/11/15 21:39	06/12/15 04:45	460-00-4	

Sample: C-CB1-soil 79' **Lab ID: 1248107008** Collected: 06/01/15 15:10 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.98	1	06/18/15 14:30	06/19/15 15:58		
Motor Oil Range	ND	mg/kg	9.8	1	06/18/15 14:30	06/19/15 15:58		
Surrogates								
n-Octacosane (S)	118	%.	70-130	1	06/18/15 14:30	06/19/15 15:58	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 01:58	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/11/15 01:58	1330-20-7	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB1-soil 79' **Lab ID: 1248107008** Collected: 06/01/15 15:10 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/11/15 01:58	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 01:58	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 01:58	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	249	50	06/11/15 21:39	06/12/15 05:12		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	98	%.	70-130	50	06/11/15 21:39	06/12/15 05:12	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	50	06/11/15 21:39	06/12/15 05:12	2037-26-5	
4-Bromofluorobenzene (S)	79	%.	70-130	50	06/11/15 21:39	06/12/15 05:12	460-00-4	

Sample: C-CB2-soil 15' **Lab ID: 1248107009** Collected: 06/02/15 08:15 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 16:27		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 16:27		
Surrogates								
n-Octacosane (S)	116	%.	70-130	1	06/18/15 14:30	06/19/15 16:27	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:21	108-88-3	
Xylene (Total)	ND	ug/kg	10	1	06/09/15 23:08	06/11/15 02:21	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 02:21	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	06/09/15 23:08	06/11/15 02:21	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 02:21	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	246	50	06/11/15 21:39	06/12/15 05:39		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 05:39	17060-07-0	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 15' **Lab ID: 1248107009** Collected: 06/02/15 08:15 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Surrogates								
Toluene-d8 (S)	102	%.	70-130	50	06/11/15 21:39	06/12/15 05:39	2037-26-5	
4-Bromofluorobenzene (S)	85	%.	70-130	50	06/11/15 21:39	06/12/15 05:39	460-00-4	

Sample: C-CB2-soil 24' **Lab ID: 1248107010** Collected: 06/02/15 08:40 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 16:56		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 16:56		
Surrogates								
n-Octacosane (S)	116	%.	70-130	1	06/18/15 14:30	06/19/15 16:56	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 02:44	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/11/15 02:44	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	102	%.	70-130	1	06/09/15 23:08	06/11/15 02:44	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 02:44	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 02:44	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	246	50	06/11/15 21:39	06/12/15 10:21		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	50	06/11/15 21:39	06/12/15 10:21	17060-07-0	
Toluene-d8 (S)	98	%.	70-130	50	06/11/15 21:39	06/12/15 10:21	2037-26-5	
4-Bromofluorobenzene (S)	80	%.	70-130	50	06/11/15 21:39	06/12/15 10:21	460-00-4	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 35' **Lab ID: 1248107011** Collected: 06/02/15 09:30 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.98	1	06/18/15 14:30	06/19/15 17:26		
Motor Oil Range	ND	mg/kg	9.8	1	06/18/15 14:30	06/19/15 17:26		
Surrogates								
n-Octacosane (S)	119	%.	70-130	1	06/18/15 14:30	06/19/15 17:26	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 03:07	108-88-3	
Xylene (Total)	ND	ug/kg	10.0	1	06/09/15 23:08	06/11/15 03:07	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 03:07	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	1	06/09/15 23:08	06/11/15 03:07	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 03:07	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	246	50	06/11/15 21:39	06/12/15 10:48		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	70-130	50	06/11/15 21:39	06/12/15 10:48	17060-07-0	
Toluene-d8 (S)	97	%.	70-130	50	06/11/15 21:39	06/12/15 10:48	2037-26-5	
4-Bromofluorobenzene (S)	83	%.	70-130	50	06/11/15 21:39	06/12/15 10:48	460-00-4	

Sample: C-CB2-soil 45' **Lab ID: 1248107012** Collected: 06/02/15 10:00 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	1.0	1	06/18/15 14:30	06/19/15 17:55		
Motor Oil Range	ND	mg/kg	10	1	06/18/15 14:30	06/19/15 17:55		
Surrogates								
n-Octacosane (S)	116	%.	70-130	1	06/18/15 14:30	06/19/15 17:55	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	994-05-8	
Benzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	75-65-0	

REPORT OF LABORATORY ANALYSIS

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www.pacelabs.com

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 45' **Lab ID: 1248107012** Collected: 06/02/15 10:00 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	106-93-4	
1,2-Dichloroethane	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	107-06-2	
Diisopropyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	108-20-3	
Ethylbenzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	91-20-3	
Toluene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:30	108-88-3	
Xylene (Total)	ND	ug/kg	9.7	1	06/09/15 23:08	06/11/15 03:30	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 03:30	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 03:30	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 03:30	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	247	50	06/11/15 21:39	06/12/15 11:15		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	101	%.	70-130	50	06/11/15 21:39	06/12/15 11:15	17060-07-0	
Toluene-d8 (S)	101	%.	70-130	50	06/11/15 21:39	06/12/15 11:15	2037-26-5	
4-Bromofluorobenzene (S)	82	%.	70-130	50	06/11/15 21:39	06/12/15 11:15	460-00-4	

Sample: C-CB2-soil 55' **Lab ID: 1248107013** Collected: 06/02/15 10:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 18:24		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 18:24		
Surrogates								
n-Octacosane (S)	125	%.	70-130	1	06/18/15 14:30	06/19/15 18:24	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	994-05-8	
Benzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	106-93-4	
1,2-Dichloroethane	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	107-06-2	
Diisopropyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	108-20-3	
Ethylbenzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	91-20-3	
Toluene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 03:53	108-88-3	
Xylene (Total)	ND	ug/kg	9.8	1	06/09/15 23:08	06/11/15 03:53	1330-20-7	

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 55' **Lab ID: 1248107013** Collected: 06/02/15 10:50 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	70-130	1	06/09/15 23:08	06/11/15 03:53	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 03:53	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 03:53	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	250	50	06/11/15 21:39	06/12/15 11:43		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	97	%.	70-130	50	06/11/15 21:39	06/12/15 11:43	17060-07-0	
Toluene-d8 (S)	96	%.	70-130	50	06/11/15 21:39	06/12/15 11:43	2037-26-5	
4-Bromofluorobenzene (S)	82	%.	70-130	50	06/11/15 21:39	06/12/15 11:43	460-00-4	

Sample: C-CB2-soil 65' **Lab ID: 1248107014** Collected: 06/02/15 11:30 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 18:54		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 18:54		
Surrogates								
n-Octacosane (S)	122	%.	70-130	1	06/18/15 14:30	06/19/15 18:54	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	994-05-8	
Benzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	106-93-4	
1,2-Dichloroethane	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	107-06-2	
Diisopropyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	108-20-3	
Ethylbenzene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	1634-04-4	
Naphthalene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	91-20-3	
Toluene	ND	ug/kg	4.9	1	06/09/15 23:08	06/11/15 14:29	108-88-3	
Xylene (Total)	ND	ug/kg	9.8	1	06/09/15 23:08	06/11/15 14:29	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	104	%.	70-130	1	06/09/15 23:08	06/11/15 14:29	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 14:29	2037-26-5	
4-Bromofluorobenzene (S)	97	%.	70-130	1	06/09/15 23:08	06/11/15 14:29	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	249	50	06/11/15 21:39	06/12/15 12:10		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 12:10	17060-07-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 65' **Lab ID: 1248107014** Collected: 06/02/15 11:30 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
Surrogates								
Toluene-d8 (S)	98	%.	70-130	50	06/11/15 21:39	06/12/15 12:10	2037-26-5	
4-Bromofluorobenzene (S)	84	%.	70-130	50	06/11/15 21:39	06/12/15 12:10	460-00-4	

Sample: C-CB2-soil 75' **Lab ID: 1248107015** Collected: 06/02/15 12:15 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 19:23		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 19:23		
Surrogates								
n-Octacosane (S)	119	%.	70-130	1	06/18/15 14:30	06/19/15 19:23	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 14:52	108-88-3	
Xylene (Total)	ND	ug/kg	9.9	1	06/09/15 23:08	06/11/15 14:52	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%.	70-130	1	06/09/15 23:08	06/11/15 14:52	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 14:52	2037-26-5	
4-Bromofluorobenzene (S)	99	%.	70-130	1	06/09/15 23:08	06/11/15 14:52	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	247	50	06/11/15 21:39	06/12/15 12:36		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 12:36	17060-07-0	
Toluene-d8 (S)	96	%.	70-130	50	06/11/15 21:39	06/12/15 12:36	2037-26-5	
4-Bromofluorobenzene (S)	82	%.	70-130	50	06/11/15 21:39	06/12/15 12:36	460-00-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Sample: C-CB2-soil 79' **Lab ID: 1248107016** Collected: 06/02/15 12:20 Received: 06/04/15 11:55 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
NWTPH-Dx GCS Silica Gel	Analytical Method: NWTPH-Dx Preparation Method: EPA 3550							
Diesel Fuel Range	ND	mg/kg	0.99	1	06/18/15 14:30	06/19/15 19:52		
Motor Oil Range	ND	mg/kg	9.9	1	06/18/15 14:30	06/19/15 19:52		
Surrogates								
n-Octacosane (S)	117	%.	70-130	1	06/18/15 14:30	06/19/15 19:52	630-02-4	
8260 MSV UST	Analytical Method: EPA 8260B Preparation Method: EPA 5030 Low							
tert-Amylmethyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	994-05-8	
Benzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	71-43-2	
tert-Butyl Alcohol	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	75-65-0	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	106-93-4	
1,2-Dichloroethane	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	107-06-2	
Diisopropyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	108-20-3	
Ethylbenzene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	100-41-4	
Ethyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	637-92-3	
Methyl-tert-butyl ether	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	1634-04-4	
Naphthalene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	91-20-3	
Toluene	ND	ug/kg	5.0	1	06/09/15 23:08	06/11/15 15:15	108-88-3	
Xylene (Total)	ND	ug/kg	10	1	06/09/15 23:08	06/11/15 15:15	1330-20-7	
Surrogates								
1,2-Dichloroethane-d4 (S)	105	%.	70-130	1	06/09/15 23:08	06/11/15 15:15	17060-07-0	
Toluene-d8 (S)	100	%.	70-130	1	06/09/15 23:08	06/11/15 15:15	2037-26-5	
4-Bromofluorobenzene (S)	98	%.	70-130	1	06/09/15 23:08	06/11/15 15:15	460-00-4	
NWTPH-Gx MSV	Analytical Method: NWTPH-Gx Preparation Method: NWTPH-Gx							
TPH as Gas	ND	mg/kg	245	50	06/11/15 21:39	06/12/15 13:03		L3
Surrogates								
1,2-Dichloroethane-d4 (S)	96	%.	70-130	50	06/11/15 21:39	06/12/15 13:03	17060-07-0	
Toluene-d8 (S)	99	%.	70-130	50	06/11/15 21:39	06/12/15 13:03	2037-26-5	
4-Bromofluorobenzene (S)	80	%.	70-130	50	06/11/15 21:39	06/12/15 13:03	460-00-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

QC Batch: DAOP/1185 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3550 Analysis Description: NWTPH-Dx GCS Silica Gel
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007

METHOD BLANK: 217588 Matrix: Solid
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Fuel Range	mg/kg	ND	0.98	06/11/15 09:59	
Motor Oil Range	mg/kg	ND	9.8	06/11/15 09:59	
n-Octacosane (S)	%.	111	70-130	06/11/15 09:59	

LABORATORY CONTROL SAMPLE: 217589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Fuel Range	mg/kg	19.7	14.8	75	70-130	
n-Octacosane (S)	%.			121	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217590 217591

Parameter	Units	1248106001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Fuel Range	mg/kg	ND	19.7	19.7	14.7	13.7	72	67	70-130	7	25	M1
n-Octacosane (S)	%.						130	129	70-130			

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

QC Batch: DAOP/1212 Analysis Method: NWTPH-Dx
QC Batch Method: EPA 3550 Analysis Description: NWTPH-Dx GCS Silica Gel
Associated Lab Samples: 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

METHOD BLANK: 220465 Matrix: Solid
Associated Lab Samples: 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Fuel Range	mg/kg	ND	0.98	06/19/15 14:30	
Motor Oil Range	mg/kg	ND	9.8	06/19/15 14:30	
n-Octacosane (S)	%.	108	70-130	06/19/15 14:30	

LABORATORY CONTROL SAMPLE: 220466

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Fuel Range	mg/kg	19.6	14.8	75	70-130	
n-Octacosane (S)	%.			112	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 220467 220468

Parameter	Units	1248107008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Fuel Range	mg/kg	ND	19.9	20	13.8	14.9	68	73	70-130	7	25	M1
n-Octacosane (S)	%.						120	119	70-130			

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QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

QC Batch: DAVM/1524 Analysis Method: EPA 8260B
QC Batch Method: EPA 5030 Low Analysis Description: 8260 MSV UST
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007, 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

METHOD BLANK: 217378 Matrix: Solid
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007, 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2-Dibromoethane (EDB)	ug/kg	ND	5.0	06/10/15 21:24	
1,2-Dichloroethane	ug/kg	ND	5.0	06/10/15 21:24	
Benzene	ug/kg	ND	5.0	06/10/15 21:24	
Diisopropyl ether	ug/kg	ND	5.0	06/10/15 21:24	
Ethyl-tert-butyl ether	ug/kg	ND	5.0	06/10/15 21:24	
Ethylbenzene	ug/kg	ND	5.0	06/10/15 21:24	
Methyl-tert-butyl ether	ug/kg	ND	5.0	06/10/15 21:24	
Naphthalene	ug/kg	ND	5.0	06/10/15 21:24	
tert-Amylmethyl ether	ug/kg	ND	5.0	06/10/15 21:24	
tert-Butyl Alcohol	ug/kg	ND	5.0	06/10/15 21:24	
Toluene	ug/kg	ND	5.0	06/10/15 21:24	
Xylene (Total)	ug/kg	ND	10.0	06/10/15 21:24	
1,2-Dichloroethane-d4 (S)	%.	101	70-130	06/10/15 21:24	
4-Bromofluorobenzene (S)	%.	98	70-130	06/10/15 21:24	
Toluene-d8 (S)	%.	99	70-130	06/10/15 21:24	

LABORATORY CONTROL SAMPLE: 217379

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromoethane (EDB)	ug/kg	39.1	39.4	101	70-130	
1,2-Dichloroethane	ug/kg	39.1	38.5	98	70-130	
Benzene	ug/kg	39.1	39.9	102	70-130	
Diisopropyl ether	ug/kg	39.1	36.8	94	70-130	
Ethyl-tert-butyl ether	ug/kg	39.1	36.5	93	70-130	
Ethylbenzene	ug/kg	39.1	37.0	94	70-130	
Methyl-tert-butyl ether	ug/kg	39.1	36.6	94	70-130	
Naphthalene	ug/kg	39.1	37.9	97	70-130	
tert-Amylmethyl ether	ug/kg	39.1	35.0	89	70-130	
tert-Butyl Alcohol	ug/kg	391	343	88	70-130	
Toluene	ug/kg	39.1	38.1	97	70-130	
Xylene (Total)	ug/kg	117	110	94	70-130	
1,2-Dichloroethane-d4 (S)	%.			100	70-130	
4-Bromofluorobenzene (S)	%.			99	70-130	
Toluene-d8 (S)	%.			102	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 217380 217381

Parameter	Units	1248107002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dibromoethane (EDB)	ug/kg	ND	39.6	39.6	37.5	37.3	95	94	70-130	0	25	
1,2-Dichloroethane	ug/kg	ND	39.6	39.6	37.1	36.8	94	93	70-130	1	25	
Benzene	ug/kg	ND	39.6	39.6	39.7	38.1	100	96	70-130	4	25	
Diisopropyl ether	ug/kg	ND	39.6	39.6	36.0	35.8	91	90	70-130	0	25	
Ethyl-tert-butyl ether	ug/kg	ND	39.6	39.6	36.1	36.1	91	91	70-130	0	25	
Ethylbenzene	ug/kg	ND	39.6	39.6	37.1	34.2	94	86	70-130	8	25	
Methyl-tert-butyl ether	ug/kg	ND	39.6	39.6	35.3	35.4	89	89	70-130	0	25	
Naphthalene	ug/kg	ND	39.6	39.6	34.7	33.6	87	84	70-130	3	25	
tert-Amylmethyl ether	ug/kg	ND	39.6	39.6	34.5	34.1	87	86	70-130	1	25	
tert-Butyl Alcohol	ug/kg	ND	396	396	342	333	86	84	70-130	3	25	
Toluene	ug/kg	ND	39.6	39.6	38.0	35.6	96	90	70-130	6	25	
Xylene (Total)	ug/kg	ND	119	119	110	103	93	86	70-130	7	25	
1,2-Dichloroethane-d4 (S)	%.						98	98	70-130			
4-Bromofluorobenzene (S)	%.						101	101	70-130			
Toluene-d8 (S)	%.						101	101	70-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

QC Batch: DAVM/1535 Analysis Method: NWTPH-Gx
QC Batch Method: NWTPH-Gx Analysis Description: NWTPH-Gx Solid GCV
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007, 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

METHOD BLANK: 218173 Matrix: Solid
Associated Lab Samples: 1248107001, 1248107002, 1248107003, 1248107004, 1248107005, 1248107006, 1248107007, 1248107008, 1248107009, 1248107010, 1248107011, 1248107012, 1248107013, 1248107014, 1248107015, 1248107016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
TPH as Gas	mg/kg	ND	250	06/11/15 22:54	
1,2-Dichloroethane-d4 (S)	%.	101	70-130	06/11/15 22:54	
4-Bromofluorobenzene (S)	%.	85	70-130	06/11/15 22:54	
Toluene-d8 (S)	%.	95	70-130	06/11/15 22:54	

LABORATORY CONTROL SAMPLE: 218174

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
TPH as Gas	mg/kg	25	33.4J	134	70-130	L0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 218175 218176

Parameter	Units	1248106002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
TPH as Gas	mg/kg	ND	24.8	24.8	33.1J	35.4J	132	141	70-130		25	M6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALIFIERS

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-DAV Pace Analytical Services - Davis

BATCH QUALIFIERS

Batch: DASG/1204

[1] All samples were extracted and analyzed out of hold time.

ANALYTE QUALIFIERS

DE	Discrete peaks present, atypical for Diesel Fuel.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L3	Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples. Results unaffected by high bias.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248107001	C-CB1-soil 10'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107002	C-CB1-soil 20'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107003	C-CB1-soil 30'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107004	C-CB1-soil 45'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107005	C-CB1-soil 55'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107006	C-CB1-soil 65'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107007	C-CB1-soil 75'	EPA 3550	DAOP/1185	NWTPH-Dx	DASG/1176
1248107008	C-CB1-soil 79'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107009	C-CB2-soil 15'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107010	C-CB2-soil 24'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107011	C-CB2-soil 35'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107012	C-CB2-soil 45'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107013	C-CB2-soil 55'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107014	C-CB2-soil 65'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107015	C-CB2-soil 75'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107016	C-CB2-soil 79'	EPA 3550	DAOP/1212	NWTPH-Dx	DASG/1204
1248107001	C-CB1-soil 10'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107002	C-CB1-soil 20'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107003	C-CB1-soil 30'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107004	C-CB1-soil 45'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107005	C-CB1-soil 55'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107006	C-CB1-soil 65'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107007	C-CB1-soil 75'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107008	C-CB1-soil 79'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107009	C-CB2-soil 15'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107010	C-CB2-soil 24'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107011	C-CB2-soil 35'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107012	C-CB2-soil 45'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107013	C-CB2-soil 55'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107014	C-CB2-soil 65'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107015	C-CB2-soil 75'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107016	C-CB2-soil 79'	EPA 5030 Low	DAVM/1524	EPA 8260B	DAVM/1525
1248107001	C-CB1-soil 10'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107002	C-CB1-soil 20'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107003	C-CB1-soil 30'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107004	C-CB1-soil 45'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107005	C-CB1-soil 55'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107006	C-CB1-soil 65'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107007	C-CB1-soil 75'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107008	C-CB1-soil 79'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107009	C-CB2-soil 15'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107010	C-CB2-soil 24'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107011	C-CB2-soil 35'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107012	C-CB2-soil 45'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107013	C-CB2-soil 55'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107014	C-CB2-soil 65'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538
1248107015	C-CB2-soil 75'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
2795 Second Street - Suite 300
Davis, CA 95618
(530) 297-4800

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Pasco WA Bulk Terminal
Pace Project No.: 1248107

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
1248107016	C-CB2-soil 79'	NWTPH-Gx	DAVM/1535	NWTPH-Gx	DAVM/1538

Pace Analytical

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 1248107

Page 1 of 2

Chain-of-Custody Record and Analysis Request

Send Report To: Jeff Hennier - jhennier@azureenvironmental.com
Company: Azure Environmental
Address: 769 Center Blvd., #123 Fairfax, CA 94930
TEL: (415) 497-2918 FAX:
MBL: (415) 497-2918
Project #: 1906-PASCO
P.O. #:
Project Name: Pasco WA Bulk Terminal

Electronic Data Deliverable (EDD): ☐ CA EDF ☐ CA WriteOn ☑ WA EIM ☐ Excel ☐ EQuIS _____ ☐ Other _____
User Location ID: CPL Pasco Bulk Terminal
User Study ID: AO7294
EDD Deliverable To (Email Address): jhennier@azureenvironmental.com
Sampling Company: Azure Environmental
Sampler Signature:
Invoice To: Jeff Baker at Tesoro Logistics, LLC

Project Address: 2900 Sacajawea Park Road Pasco, WA 99301

Sample ID	Location ID	Sampling: Date	Sampling: Time	# of Containers: 40 ml VOA	Sleeve	Poly	Glass	Tedlar		# Preserved: HCl	HNO_3	None			Matrix: Water	Soil	Vapor	Other (specify)	TPH: NWTPH-Gx	NWTPH-Dx w/silica gel; Diesel range and Motor Oil rang	Other (specify):	8260B: BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates: MTBE	DIPE	ETBE	TAME	TBA	7 Oxygenates (5 Oxygenates plus): Ethanol	Methanol	Lead Scavengers: 1,2 DCA	1,2 EDB	Halogenated Volatile Organic Compounds (former 8010 list)	Naphthalene	524: Volatile Organics by EPA Method 524.2	Metals: Metals Group (Method: ☐ CAM 17 ☐ LUFT 5)	Individual Metals (list and enter method):	SHORT HOLD: ☐ Nitrate as N ☐ Nitrite as N ☐ Ferrous Iron	☐ Nitrate as NO_3 ☐ Nitrite as NO_2	Chromium VI by (circle one: EPA 7199 EPA 7196)	Other: Methane	Sulfate	Dissolved Manganese	Alkalinity	MS/MSD	For Lab Use Only
C-CB1-soil 10'	AO7294_CB1	6/1/15	10:45				1					X				X			X	X		X							X	X		X												001
C-CB1-soil 20'	AO7294_CB1	↓	11:50				1					X				X			X	X		X							X	X		X												002
C-CB1-soil 30'	AO7294_CB1		12:15				1					X				X			X	X		X							X	X		X												003
C-CB1-soil 45'	AO7294_CB1		12:50				1					X				X			X	X		X							X	X		X												004
C-CB1-soil 55'	AO7294_CB1		13:25				1					X				X			X	X		X							X	X		X												005
C-CB1-soil 65'	AO7294_CB1		14:20				1					X				X			X	X		X							X	X		X												006
C-CB1-soil 75'	AO7294_CB1		15:05				1					X				X			X	X		X							X	X		X												007
C-CB1-soil 79'	AO7294_CB1	↓	15:10				1					X				X			X	X		X							X	X		X												008
~~C-CB1-soil~~	~~AO7294_CB1~~						1					X				X			X	X		X							X	X		X												
C-CB1-soil	AO7294_CB1						1					X				X			X	X		X							X	X		X												

Relinquished by (signature/affiliation)	Date & Time	Received by (signature/affiliation)	Date & Time
	6/3/15 13:00	FedEx - Pasco	
		PACE Analytical	060415 1155
		Received by Pace Analytical (signature):	

Remarks and Special Instructions (composite, filter, MS/MSD, return samples, Silica Gel, etc.)
See modifications to Analysis Request

Turnaround Time (TAT - Circle One): {Note 72-Hour Hold Time}
(Standard) 4-Day 3-Day 2-Day 1-Day Other: _____
TAT in business days. Surcharge may apply. TAT for subcontracted work may vary. Advance notice to Pace of your sampling event is recommended or Short Hold or expedited TAT cannot be guaranteed.

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Rev. 120514

Pace Analytical

2795 2nd Street, Suite 300
Davis, CA 95618
Lab: 530.297.4800
Fax: 530.297.4802

SRG # / Lab No. 1248107

Page 2 of 2

Chain-of-Custody Record and Analysis Request

Send Report To: Jeff Hennier - jhennier@azureenvironmental.com
Company: Azure Environmental
Address: 769 Center Blvd., #123 Fairfax, CA 94930
TEL: (415) 497-2918 FAX:
MBL: (415) 497-2918
Project #: 1906-PASCO P.O. #:
Project Name: Pasco WA Bulk Terminal

Electronic Data Deliverable (EDD): ☐ CA EDF ☐ CA WriteOn ☑ WA EIM ☐ Excel ☐ EQuIS _____ ☐ Other _____
User Location ID: CPL Pasco Bulk Terminal
User Study ID: AO7294
EDD Deliverable To (Email Address): jhennier@azureenvironmental.com
Sampling Company: Azure Environmental
Sampler Signature:
Invoice To: Jeff Baker at Tesoro Logistics, LLC

Project Address: 2900 Sacajawea Park Road Pasco, WA 99301

Sample ID	Location ID	Sampling Date	Sampling Time	# of Containers: 40 ml VOA	Sleeve	Poly	Glass	Tedlar	# Preserved: HCl	HNO_3	None			Matrix: Water	Soil	Vapor	Other (specify)	TPH: NWTPH-Gx	NWTPH-Dx w/silica gel; Diesel range and Motor Oil rang	Other (specify):	8260B: BTEX (EPA 8260B)	TPH Gas (EPA 8260B)	5 Oxygenates: MTBE DIPE ETBE TAME TBA	7 Oxygenates (5 Oxygenates plus): Ethanol Methanol	Lead Scavengers: 1,2 DCA 1,2 EDB	Halogenated Volatile Organic Compounds (former 8010 list)	Naphthalene	524: Volatile Organics by EPA Method 524.2	Metals: Metals Group (Method: ____) ☐ CAM 17 ☐ LUFT 5	Individual Metals (list and enter method):	SHORT HOLD: ☐ Nitrate as N ☐ Nitrite as N ☐ Ferrous Iron	☐ Nitrate as NO_3 ☐ Nitrite as NO_2	Chromium VI by (circle one: EPA 7199 EPA 7196)	Other: Methane	Sulfate	Dissolved Manganese	Alkalinity	MS/MSD	For Lab Use Only
C-CB2-soil 15'	AO7294_CB2	6/2/15	8:15				1				X				X			X	X		X			X	X		X											009
C-CB2-soil 24'	AO7294_CB2	↓	8:40				1				X				X			X	X		X			X	X		X											010
C-CB2-soil 35'	AO7294_CB2		9:30				1				X				X			X	X		X			X	X		X											011
C-CB2-soil 45'	AO7294_CB2		10:00				1				X				X			X	X		X			X	X		X											012
C-CB2-soil 55'	AO7294_CB2		10:50				1				X				X			X	X		X			X	X		X											013
C-CB2-soil 65'	AO7294_CB2		11:30				1				X				X			X	X		X			X	X		X											014
C-CB2-soil 75'	AO7294_CB2		12:15				1				X				X			X	X		X			X	X		X											015
C-CB2-soil 79'	AO7294_CB2	↓	12:20				1				X				X			X	X		X			X	X		X											016
~~C-CB2-soil~~	~~AO7294_CB2~~						1				X				X			X	X		X			X	X		X											
~~C-CB2-soil~~	~~AO7294_CB2~~						1				X				X			X	X		X			X	X		X											

Relinquished by (signature/affiliation):	Date & Time	Received by (signature/affiliation):	Date & Time
	6/3/15 13:00	FedEx - Pasco	
Relinquished by (signature/affiliation):	Date & Time	Received by (signature/affiliation):	Date & Time
		PACE Analytical	060415 1155
Relinquished by (signature/affiliation):	Date & Time	Received by Pace Analytical (signature):	Date & Time

Remarks and Special Instructions (composite, filter, MS/MSD, return samples, Silica Gel, etc.):
See modifications to Analysis Request

Turnaround Time (TAT - Circle One): {Note 72-Hour Hold Time}
Standard 4-Day 3-Day 2-Day 1-Day Other: _____
TAT in business days. Surcharge may apply. TAT for subcontracted work may vary. Advance notice to Pace of your sampling event is recommended or Short Hold or expedited TAT cannot be guaranteed.

Distribution: Original - Lab; Copy - Originator
Rev. 120514

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 25Feb2015 Page 1 of 1
	Document No.: F-DAV-C-002-rev.02	Issuing Authority: Pace Davis, CA Quality Office

Sample Condition Upon Receipt

Client Name: Azure

Project #: WO#: 1248107

1248107

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ OnTrac ☐ Other:

Tracking Number: 6071 1280 9333

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☐ Yes ☒ No

Thermom. Used: ☐ DA1434 ☐ DA2285 **Type of Ice:** ☐ Wet ☐ Blue ☐ Dry Ice ☐ None ☐ Samples on ice, cooling process has begun

Cooler Temp Read(°C): 0.6 **Cooler Temp Corrected(°C):** 0.6 **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** 0 **Date and Initials of Person Examining Contents:** 6/9/15

Comments:

Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Chain of Custody Filled Out?	☒ Yes	☐ No	☐ N/A	2.
Chain of Custody Relinquished?	☒ Yes	☐ No	☐ N/A	3.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No	☐ N/A	6.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	7.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	8.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	9. only on first 8 samples (001-008)
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL	☒ Yes	☐ No	☐ N/A	12.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☒ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☒ N/A	Sample #
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC	☒ Yes	☐ No		Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Present?	☐ Yes	☒ No	☐ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

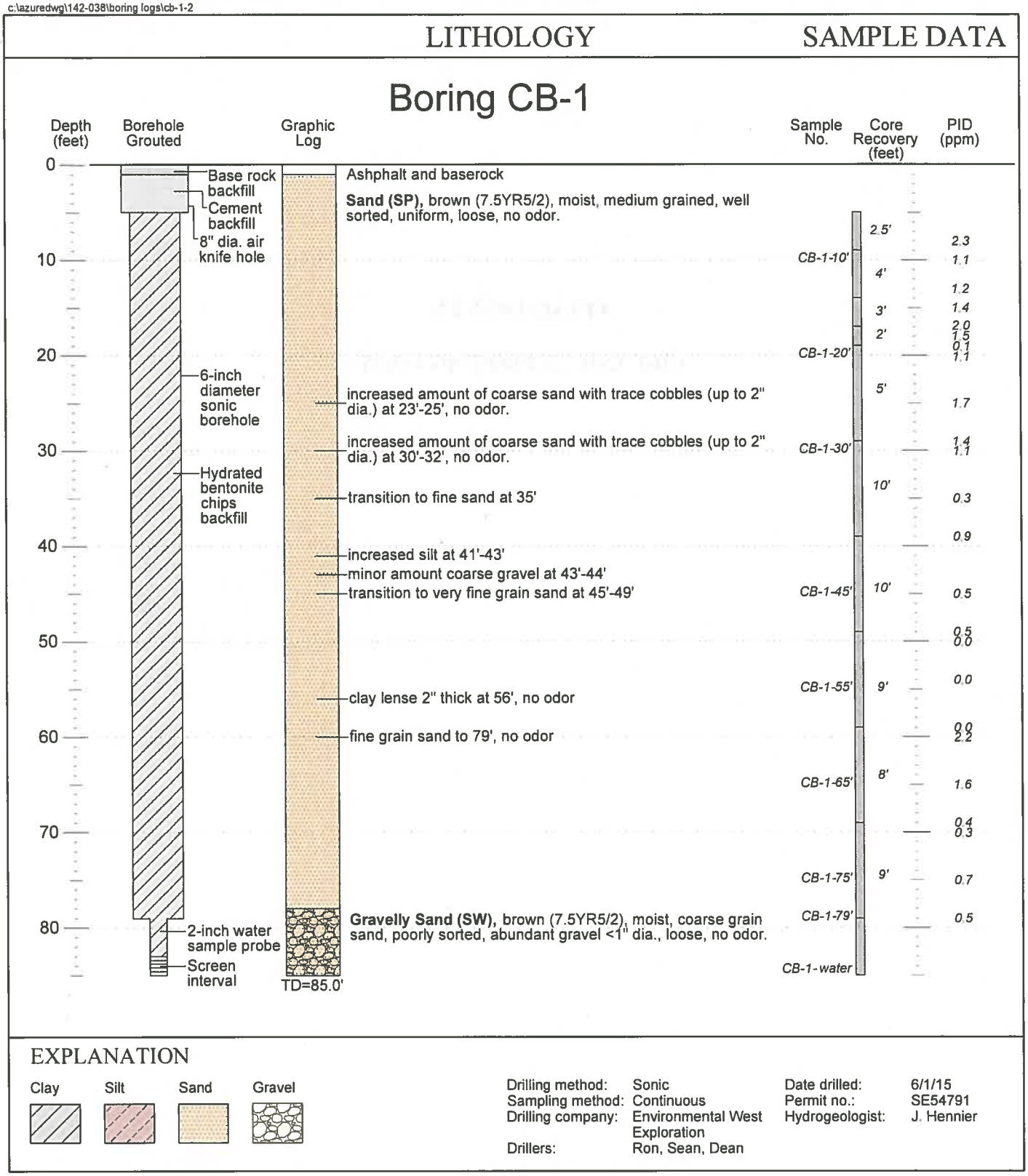
Project Manager Review: Date: 6/9/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

ATTACHMENT 2

CB-1 AND CB-2 BORING LOGS

c:\azuredwg\142-038\boring logs\cb-1-2



EXPLANATION

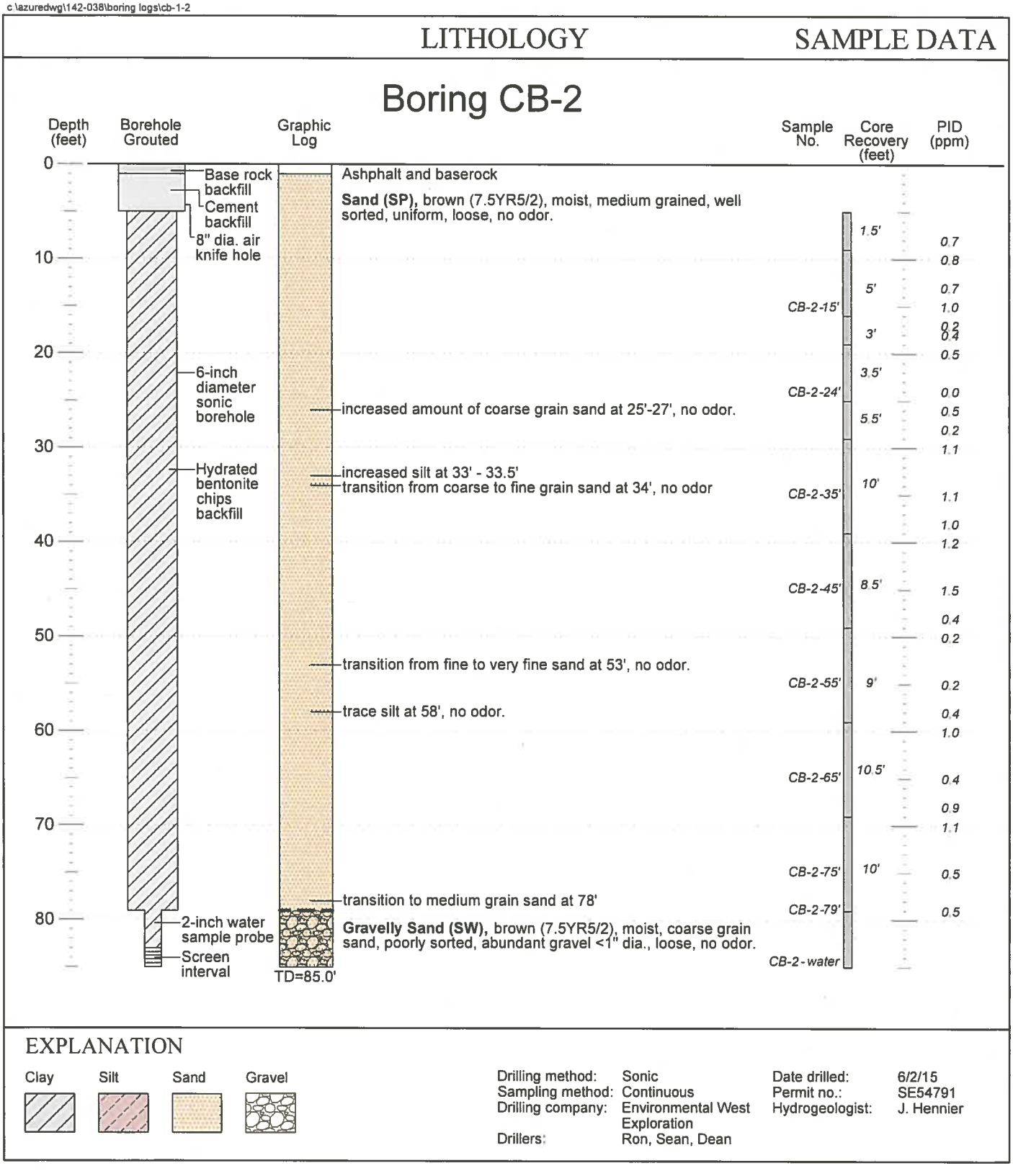
Clay Silt Sand Gravel

Drilling method:	Sonic	Date drilled:	6/1/15
Sampling method:	Continuous	Permit no.:	SE54791
Drilling company:	Environmental West Exploration	Hydrogeologist:	J. Hennier
Drillers:	Ron, Sean, Dean		

AZURE ENVIRONMENTAL

Figure A-1: Soil Boring Log CB-1

c:\azuredwg\142-038\boring logs\cb-1-2



EXPLANATION

Clay Silt Sand Gravel

Drilling method:	Sonic	Date drilled:	6/2/15
Sampling method:	Continuous	Permit no.:	SE54791
Drilling company:	Environmental West Exploration	Hydrogeologist:	J. Hennier
Drillers:	Ron, Sean, Dean		

AZURE ENVIRONMENTAL

Figure A-2: Soil Boring Log CB-2

APPENDIX D
Health and Safety Plan

Health and Safety Plan

Pasco Terminal

Prepared for

Tidewater Barge Lines

2900 Sacajewea Park Road, Pasco, WA

January 2017

CH2M
999 W. Riverside
Spokane, WA 99201

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CH2M HILL HEALTH AND SAFETY PLAN

This Health and Safety Plan (HSP) will be kept on the site during field activities and will be reviewed as necessary. The plan will be amended or revised as project activities or conditions change or when supplemental information becomes available. The plan adopts, by reference, the Enterprise-wide Core Standards (CS) and Standard Operating Procedures (SOPs), as appropriate. In addition, this plan adopts procedures in the project Work Plan. The Safety Coordinator (SC) is to be familiar with the CSs and SOPs and the contents of these instructions. CH2M HILL's personnel and subcontractors must be trained on this plan and sign Attachment 1.

Project Information and Background

PROJECT NO: TBD

CLIENT: Tidewater

PROJECT/SITE NAME: Pasco Terminal

SITE ADDRESS: 2900 Sacajewea Park Road, Pasco, WA

CH2M HILL PROJECT MANAGER: Bob Martin/SPK

DATE HEALTH AND SAFETY PLAN PREPARED: January 2017

DATE(S) OF SITE WORK: TBD

SITE ACCESS: None

SITE SIZE: 4 acres

SITE TOPOGRAPHY: Relatively Flat

PREVAILING WEATHER: Seasonal winter (below freezing) and summer (greater than 100 degrees F)

SITE DESCRIPTION AND HISTORY: Chevron Terminal Facility (third party site). Location of Tidewater pipe line release, approximately 80 feet of unsaturated zone impacted with gasoline product floating on groundwater. Existing vapor extraction and pumping system onsite and operating. Product plume controlled and greatly reduced (in volume and areal extent).

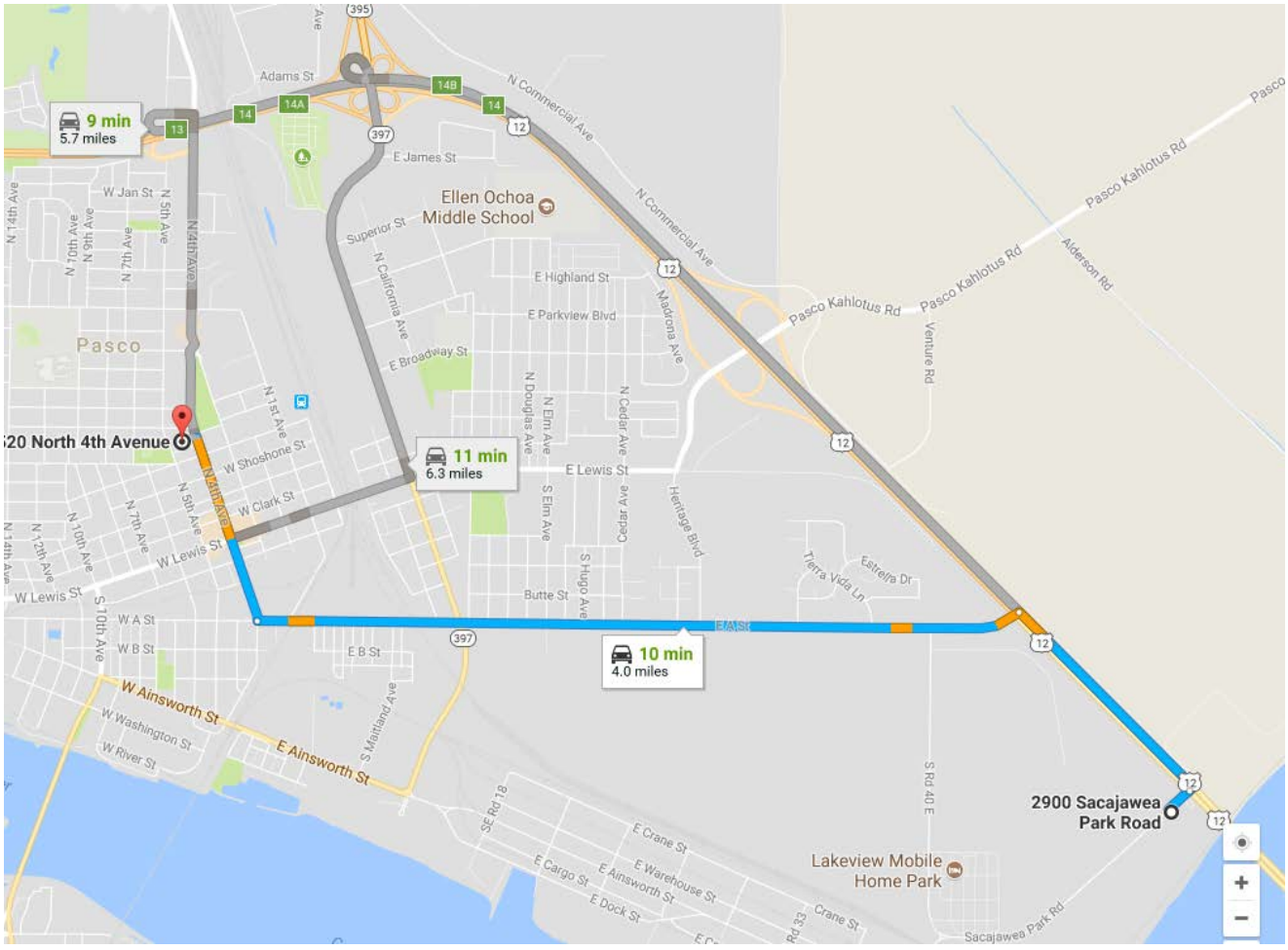
DESCRIPTION OF SPECIFIC TASKS TO BE PERFORMED: Groundwater sampling and well development at existing wells.

Site Map

From: 2900 Sacajawea Park Road
Pasco, WA

To: 520 North 4th Avenue
Pasco, WA

Directions	**Distance**
There are 0.47 miles between 2900 Sacajawea Park Road and the start of the directions. Use local roads to get to the start of the directions.	
1: Start out going Northeast on SACAJAWEA PARK RD.	1.2 miles
2: Take US-12 W.	4.3 miles
3: Take the FOURTH AVE. exit, exit number 13.	0.1 miles
4: Turn RIGHT onto ramp.	0.1 miles
5: Turn RIGHT onto N 4TH AVE/GLADE NORTH RD.	0.1 miles
6: Stay straight to go onto N 4TH AVE.	1.0 miles
Total Distance:	6.8 miles
Estimated Time:	13 minutes



Emergency Contacts

24-hour CH2M HILL Serious Incident Reporting Contact/Pager – 720-286-4911

If injured on the job, notify your supervisor and then call 1-866-893-2514 to contact CH2M HILL'S Occupational Nurse

Medical Emergency -- 911 **Facility Medical Response #:** **Local Ambulance #:**	**CH2M HILL- Medical Consultant** WorkCare Dr. Peter Greaney M.D. 300 S. Harbor Blvd, Suite 600 Anaheim , CA 92805 800-455-6155 714-978-7488
Urgent Care Facility **Lourdes Medical Center** 520 North 4th Avenue, Pasco, WA 99301	**CH2M HILL Director Security Operations** Thomas Horton/DEN 720/273-3100 (cell) or 720/286-0022 (office)
Fire/Spill Emergency -- 911 **Facility Fire Response #:** **Local Fire Dept #:**	**Responsible Health and Safety Manager (RHSM)** Name: Mark Orman Phone: 414-712-4138
Security & Police – 911 **Facility Security #:** **Local Police #:**	**Human Resources Department** Name: Sherri Huntley Phone: 703-376-5192
Utilities Emergency Phone Numbers Water: Gas: Electric:	**Worker's Compensation:** Contact Business Group HR dept. to have form completed or contact Jennifer Rindahl after hours: (720)891-5382
Safety Coordinator (SC) Name: Reuben Greer Phone: 509-464-7215 Cell: 509-280-9136	**Media Inquiries Corporate Strategic Communications** Name: John Corsi Phone: (720) 286-2087
Project Manager Name: Bob Martin Phone: 509-4647240 Cell: 509-370-3866	**Automobile Accidents** Rental: Linda Anderson/COR 720/286-2401 CH2M HILL owned vehicle: Linda George 720-286-2057
Federal Express Dangerous Goods Shipping Phone: 800/238-5355	**CH2M HILL Dangerous Goods Shipping** **Phone: 800/255-3924**
Facility Alarms: TBD	Evacuation Assembly Area(s): TBD
Facility/Site Evacuation Route(s): TBD	

Directions to Local Hospital

Local Hospital: 520 North 4th Avenue, Pasco, WA 99301

1.0 Tasks to be Performed under this Plan

1.1 Description of Tasks

Refer to project documents (i.e., Work Plan) for detailed task information. A health and safety risk analysis (Table 1) has been performed for each task and is incorporated in this plan through task-specific hazard controls and requirements for monitoring and protection. Tasks other than those listed below require an approved amendment or revision to this plan before tasks begin. Refer to Section 8.2 for procedures related to "clean" tasks that do not involve hazardous waste operations and emergency response (Hazwoper).

1.1.1 Hazwoper-Regulated Tasks

1.1.2 1.1.1 Hazwoper-Regulated Tasks

- Groundwater sampling
- IDW (purge water) management

1.1.3 Non-Hazwoper-Regulated Tasks

Under specific circumstances, the training and medical monitoring requirements of federal or state Hazwoper regulations are not applicable. It must be demonstrated that the tasks can be performed without the possibility of exposure in order to use non-Hazwoper-trained personnel. **Prior approval from the Responsible Health and Safety Manager (RHSM) is required before these tasks are conducted on regulated hazardous waste sites.**

1.2 Change Management

PROJECT HS&E Change Management Form *This evaluation form should be reviewed on a **continuous** basis to determine if the current site health and safety plan adequately addresses ongoing project work, and should be completed whenever new tasks are contemplated or changed conditions are encountered.*	
Project Task:	Project/Task Manager:
Project Number:	Project Name:

	Evaluation Checklist	Yes	No
1.	Has the CH2M HILL staff listed in the original HASP changed?		X
2.	Has a new subcontractor been added to the project?		X
3.	Is any chemical or product to be used that is not listed in Attachment 2 of the plan?		X
4.	Have additional tasks been added which were not originally addressed in Section 1.1 of the plan?		X
5.	Have new contaminants or higher than anticipated levels of original contaminants been encountered?		X
6.	Has other safety, equipment, activity or environmental hazards been encountered that are not addressed in Section 2.1 of the plan?		X

If the answer is "YES" to Questions 1-3, an HSP revision is NOT needed. Please take the following actions:

- Confirm that staff's medical and training status is current – check training records at: http://www.int.ch2m.com/hands (or contact your regional SPA), and confirm subcontractor qualifications.
- Confirm with the project KA that subcontractor safety performance has been reviewed and is acceptable.
- Confirm with H&S that subcontractor safety procedures have been reviewed and are acceptable.

If the answer is "YES" to Questions 4-6, an HSP revision MAY BE NEEDED.

1.3 Task Hazard Analysis

(Refer to Section 2 for hazard controls)

POTENTIAL HAZARDS	TASKS		
	Well Redevelopment and Groundwater Sampling	Field Surveying	IDW Management
Flying debris/objects	X		X
Noise > 85dBA	X		X
Electrical	X		X
Suspended loads	X		X
Slip, trip, fall	X	X	X
Back injury	X	X	X
Visible lightning	X	X	X
Fires	X		X
Entanglement	X		X
IDW Management			X

2.0 Hazard Controls

This section provides safe work practices and control measures used to reduce or eliminate potential hazards. These practices and controls are to be implemented by the party in control of either the site or the particular hazard. CH2M HILL employees and subcontractors must remain aware of the hazards affecting them regardless of who is responsible for controlling the hazards. CH2M HILL employees and subcontractors who do not understand any of these provisions should contact the RHSM for clarification.

The health and safety hazards posed by field activities have been identified for each project activity and are provided in the Hazard Analysis Table (Table 1). Hazard control measures for project-specific and general H&S hazards are provided in Sections 2.1, 2.2, and 2.3.

In addition to the controls specified in this section, Project-Activity Self-Assessment Checklists are contained in Attachment 4. These checklists are to be used to assess the adequacy of CH2M HILL and subcontractor site-specific safety requirements. The objective of the self-assessment process is to identify gaps in project safety performance and prompt corrective actions in addressing these gaps. Self-assessment checklists should be completed early in the project, when tasks or conditions change, or when otherwise specified by the RHSM. The self-assessment checklists, including documented corrective actions, should be made part of the permanent project records.

Applicable project activity self-assessment checklists (see Attachment 4) shall be completed weekly by a CH2M HILL representative during the course of the project depending on the work performed at the time.

2.1 Project-Specific Hazards

2.1.1 Drum Handling

- Ensure that personnel are trained in proper lifting and moving techniques to prevent back injuries.
- Provide equipment to keep the operator removed from the drums to lessen the likelihood of injury. Such equipment might include: a drum grappler attached to a hydraulic excavator; a small front-end loader, which can be either loaded manually or equipped with a bucket sling; a rough terrain forklift; Roller conveyor equipped with solid rollers; drum carts designed specifically for drum handling.
- Make sure the vehicle selected has sufficient rated load capacity to handle the anticipated loads, and make sure the vehicle can operate smoothly on the available road surface.
- Ensure there are Plexiglas cab shields on loaders, backhoes, etc., when handling drums containing potentially explosive materials.
- Equipment cabs should be supplied with fire extinguishers, and should be air-conditioned to increase operator efficiency.
- Supply operators with appropriate respiratory protective equipment when needed.
- Ensure that drums are secure and are not in the operator's view of the roadway.
- Prior to handling, all personnel should be warned about hazards of handling.
- Throughout handling, personnel should be alert for information leading to the identity of new hazards. Exercise extreme caution in handling drums that are not intact and tightly sealed.

- Before moving anything, determine the most appropriate sequence in which the various drums and other containers should be moved (e.g. small containers may have to be removed first to permit heavy equipment to enter and move the drums.
- Overpack drums and an adequate volume of absorbent should be kept near areas where minor spills may occur.

2.1.2 Electrical

(Reference CH2M HILL SOP HSE-206, *Electrical Safety*)

General Electrical Safety

- Only qualified personnel are permitted to work on unprotected energized electrical systems.
- Only authorized personnel are permitted to enter high-voltage areas.
- Do not tamper with electrical wiring and equipment unless qualified to do so. All electrical wiring and equipment must be considered energized until lockout/tagout procedures are implemented.
- Inspect electrical equipment, power tools, and extension cords for damage prior to use. Do not use defective electrical equipment, remove from service.
- CH2M HILL has selected Ground Fault Circuit Interrupters (GFCIs) as the standard method for protecting employees from the hazards associated with electric shock.
  - GFCIs shall be used on all 120-volt, single phase 15 and 20-amphere receptacle outlets which are not part of the permanent wiring of the building or structure.
- An assured equipment grounding conductor program may be required under the following scenarios:
  - GFCIs can not be utilized
  - Client requires such a program to be implemented
  - Business group decides to implement program in addition to GFCI protection
- Extension cords must be equipped with third-wire grounding. Cords passing through work areas must be covered, elevated or protected from damage. Cords should not be routed through doorways unless protected from pinching. Cords should not be fastened with staples, hung from nails, or suspended with wire.
- Electrical power tools and equipment must be effectively grounded or double-insulated UL approved.
- Operate and maintain electric power tools and equipment according to manufacturers' instructions.
- Maintain safe clearance distances between overhead power lines and any electrical conducting material unless the power lines have been de-energized and grounded, or where insulating barriers have been installed to prevent physical contact. Maintain at least 10 feet from overhead power lines for voltages of 50 kV or less, and 10 feet plus ½ inch for every 1 kV over 50 kV.
- Temporary lights shall not be suspended by their electric cord unless designed for suspension. Lights shall be protected from accidental contact or breakage.
- Protect all electrical equipment, tools, switches, and outlets from environmental elements.

2.1.3 Field Vehicles

- Field vehicles may be personal vehicles, rental vehicles, fleet vehicles or project vehicles.

- Fleet vehicles are equipped with emergency supplies. It is a project responsibility to equip all project vehicles with emergency equipment.
- Maintain both a First Aid kit and Fire Extinguisher in the field vehicle at all times.
- Utilize a rotary beacon on vehicle if working adjacent to active roadway.
- Car rental must meet the following requirements:
  - Dual air bags
  - Antilock brakes
  - Be midsize or larger
- Familiarize yourself with rental vehicle features:
  - Mirror adjustments
  - Seat adjustments
  - Cruise control features, if offered
  - Pre-program radio stations
- Always wear seatbelt while operating vehicle.
- Adjust headrest to proper position.
- Tie down loose items if utilizing a van.
- Pull off the road, put the car in park and turn on flashers before talking on a mobile phone.
- Close car doors slowly and carefully. Fingers can get pinched in doors.
- Park vehicle in a location where it can be accessed easily in the event of an emergency. If not possible, carry a phone.
- Have a designated place for storing the field vehicle keys when not in use.

2.1.4 Fire Prevention

- Fire extinguishers shall be provided so that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher must be within 50 feet. Extinguishers must:
  - be maintained in a fully charged and operable condition,
  - be visually inspected each month, and
  - undergo a maintenance check each year.
- The area in front of extinguishers must be kept clear.
- Post "Exit" signs over exiting doors, and post "Fire Extinguisher" signs over extinguisher locations.
- Combustible materials stored outside should be at least 10 feet from any building.
- Solvent waste and oily rags must be kept in a fire resistant, covered container until removed from the site.
- Flammable/combustible liquids must be kept in approved containers, and must be stored in an approved storage cabinet.

2.1.5 Hand and Power Tools

(Reference CH2M HILL, SOP HSE-210, *Hand and Power Tools*)

- Tools shall be inspected prior to use and damaged tools will be tagged and removed from service.

- Hand tools will be used for their intended use and operated in accordance with manufacturer's instructions and design limitations;
- Maintain all hand and power tools in a safe condition.
- Use PPE (such as gloves, safety glasses, earplugs, and face shields) when exposed to a hazard from a tool.
- Do not carry or lower a power tool by its cord or hose.
- Portable power tools will be plugged into GFCI protected outlets; and
- Portable power tools will be Underwriters Laboratories (UL) listed and have a three-wire grounded plug or be double insulated.
- Disconnect tools from energy sources when they are not in use, before servicing and cleaning them, and when changing accessories (such as blades, bits, and cutters).
- Safety guards on tools must remain installed while the tool is in use and must be promptly replaced after repair or maintenance has been performed.
- Store tools properly in a place where they will not be damaged or come in contact with hazardous materials.
- If a cordless tool is connected to its recharge unit, both pieces of equipment must conform strictly with electrical standards and manufacturer's specifications.
- Tools used in an explosive environment must be rated for work in that environment (that is, intrinsically safe, spark-proof, etc.).
- When using a knife or blade tool, stroke or cut away from the body with a smooth motion. Be careful not to use excessive force that could damage the tool, the material being cut or unprotected hands.
- Working with manual and pistol-grip hand tools may involve highly repetitive movement, extended elevation, constrained postures, and/or awkward positioning of body members (for example, hand, wrist, arm, shoulder, neck, etc.). Consider alternative tool designs, improved posture, the selection of appropriate materials, changing work organization, and sequencing to prevent muscular, skeletal, repetitive motion, and cumulative trauma stressors.

2.1.6 Drum Sampling Safety

Personnel are permitted to handle and/or sample drums containing certain types of waste (drilling waste, investigation-derived waste, waste from known sources) only; handling or sampling drums with unknown contents requires a plan revision or amendment approved by the CH2M HILL RHSM. The following control measures will be taken when sampling drums:

- Minimize transportation of drums.
- Sample only labeled drums or drums known to contain IDW.
- Use caution when sampling bulging or swollen drums. Relieve pressure slowly.
- If drums contain, or potentially contain, flammable materials, use non-sparking tools to open.
- Picks, chisels, and firearms may not be used to open drums.
- Reseal bung holes or plugs whenever possible.
- Avoid mixing incompatible drum contents.
- Sample drums without leaning over the drum opening.

- Transfer the content of drums using a method that minimizes contact with material.
- PPE and air monitoring requirements specified in Sections 4 and 5 must address IDW drum sampling.
- Spill-containment procedures specified in Section 7 must be appropriate for the material to be handled.
- All drums and liquid transfer equipment should be grounded to reduce the potential of a static discharge.

2.1.7 Knife Use

Open-bladed knives (e.g., box cutters, utility knives, pocket knives, machetes, and multi-purpose tools with fixed blades such as a Leathermen™) are prohibited at worksites except where the following three conditions are met:

- The open-bladed knife is determined to be the best tool for the job.
- An approved Activity Hazard Analysis (AHA) or written procedure is in place that covers the necessary safety precautions (work practices, PPE, and training).
- Knife users have been trained and follow the AHA.

Responsibilities	• Supervisors with assistance from the FTL/SC are responsible for funding and ensuring the correct tool is being used, employees wear the proper PPE when using knives, and they have reviewed this policy. • Employees are responsible for having and utilizing the proper PPE while performing an activity requiring the use of a knife. Employees are also responsible for understanding the proper use of a knife.
Glove Requirements	• In general, Kevlar cut resistant gloves are to be worn when using a knife in an occupational setting. • Other types of gloves may be required and will be identified within the AHA / written procedure. Example - Leather gloves may be worn when using the acetate sleeve cutter.

Training (Ref. VO for additional hand safety topics)	All employees that will use a knife must be trained in the proper use. • When using a knife always cut away from yourself. • Many tasks using a utility knife require a knife edge but not a sharp point. For these tasks you can add protection against puncture wounds by using a rounded-tip blade. • If you use a folding knife, it must be a locking blade type. • Never use a knife that will fold under pressure. • If you use a fixed blade knife, make sure there is a handle guard to keep your hand from slipping forward. Also, make sure the handle is dry and non- greasy/slippery to assure a better grip. • When cutting, make the force of the cut carry the blade away from any part of your body. If you have a peculiar situation where this is not possible, protect yourself with a leather apron, or other material placed between you and the blade. Consider putting the material to be cut in a vise, or other holding device. • If you carry a fixed blade knife, use a sheath or holder. • Store utility knives safely, retract the blade or sheath an open blade before storing. Never, leave a knife with the blade exposed on the floor, on a pallet, on a work surface, or in a drawer or cabinet. • Keep your knife sharp. A dull blade requires you to use more force to cut, and consequently increases the risk of slip or mistake. • Knives used on the job, but not carried with you , must be properly stored when not in use • Never use a defective knife. • Utility knife blades are brittle and can snap easily. Don't bend them or apply side loads to them by using them to open cans or pry loose objects. Use the knife only to cut. It was not designed to work as a prybar, screw driver, hole punch, and other assorted things that make it seem so easy. • If you do get cut, seek medical attention to treat the injury by notifying your supervisor and contacting WorkCare at 1-866-893-2514.

Examples of preferred tools and Kevlar cut resistant gloves:

A safety spring provides for automatic blade "shoot-back" into the handle when contact w/cutting surface is lost

Stay focused on the cutting job. It only takes a second of inattention with a sharp blade to produce a serious cut. Letting the mind wander or talking with others while using a knife greatly increases the risk of an accident and injury. If you are interrupted while working with a knife, stop cutting, retract the blade, and place the knife down on a secure surface before dealing with the interruption. You should never continue cutting while distracted!

As always, utilize the hierarchy of controls and first attempt to engineer out the hazard and frequently ask ourselves do we have the right tool for the job.

2.1.8 Manual Lifting

(Reference CH2M HILL SOP HSE-112, *Manual Lifting*)

- Back injuries are the leading cause of disabling work and most back injuries are the result of improper lifting techniques or overexertion. Office or field tasks and activities involving manual lifting are to be identified and a program implemented to assist employees to mitigate the risks associated with manual lifting.
- When possible, the task should be modified to minimize manual lifting hazards.
- Lifting of loads weighing more than 40 pounds (18 kilograms) should be evaluated by the SC using the Lifting Evaluation Form contained in SOP HSE-112.
- Using mechanical lifting devices is the preferred means of lifting heavy objects such as forklifts; cranes, hoists, and rigging; hand trucks; and trolleys.
- Personnel shall seek assistance when performing manual lifting tasks that appear beyond their physical capabilities.
- In general, the following steps must be practiced when planning and performing manual lifts: Assess the situation before you lift; ensure good lifting and body positioning practices; ensure good carrying and setting down practices.
- All employees must receive training for the correct procedures to lift safely using the computer-based health and safety training or project-specific training.

2.1.9 Noise

(Reference CH2M HILL SOP HSE-108, *Hearing Conservation*)

- A noise assessment shall be conducted by the RHSM or designee based on potential to emit noise above 85 dBA.

- Areas or equipment emitting noise at or above 90dBA shall be evaluated to determine feasible engineering controls. When engineering controls are not feasible, administrative controls can be developed and appropriate hearing protection will be provided.
- Areas or equipment emitting noise levels at or above 85 dBA, hearing protection must be worn.
- Employees exposed to 84 dBA or a noise dose of 50% must participate in the Hearing Conservation program including initial and annual (as required) audiograms.
- The RHSM will evaluate appropriate controls measures and work practices for employees who have experienced a standard threshold shift (STS) in their hearing.
- Hearing protection is selected based upon noise levels and specific tasks to be performed.
- Employees are trained in the hazards of noise and how to properly wear and maintain their hearing protection.
- Hearing protection will be maintained in a clean and reliable condition, inspected prior to use and after any occurrence to identify any deterioration or damage, and damaged or deteriorated hearing protection repaired or discarded.
- In work areas where actual or potential high noise levels are present at any time, hearing protection must be worn by employees working or walking through the area.
- Areas where tasks requiring hearing protection are taking place may become hearing protection required areas as long as that specific task is taking place.
- High noise areas requiring hearing protection should be posted or employees must be informed of the requirements in an equivalent manner.

2.1.10 Visible Lighting

- While work is in progress outside construction areas shall have at least 33 lux (lx).
- Construction work conducted inside buildings should be provided with at least 55 lux light.
- The means of egress shall be illuminated with emergency and non-emergency lighting to provide a minimum 11 lx measured at the floor. Egress illumination shall be arranged so that the failure of any single lighting unit, including the burning out of an electric bulb will not leave any area in total darkness.

2.2 General Hazards

2.2.1 General Practices and Housekeeping

- Site work should be performed during daylight hours whenever possible.
- Good housekeeping must be maintained at all times in all project work areas.
- Common paths of travel should be established and kept free from the accumulation of materials.
- Keep access to aisles, exits, ladders, stairways, scaffolding, and emergency equipment free from obstructions.
- Provide slip-resistant surfaces, ropes, and/or other devices to be used.
- Specific areas should be designated for the proper storage of materials.
- Tools, equipment, materials, and supplies shall be stored in an orderly manner.
- As work progresses, scrap and unessential materials must be neatly stored or removed from the work area.

- Containers should be provided for collecting trash and other debris and shall be removed at regular intervals.
- All spills shall be quickly cleaned up. Oil and grease shall be cleaned from walking and working surfaces.
- Review the safety requirements of each job you are assigned to with your supervisor. You are not expected to perform a job that may result in injury or illness to yourself or to others.
- Familiarize yourself with, understand, and follow jobsite emergency procedures.
- Do not fight or horseplay while conducting the firm's business.
- Do not use or possess firearms or other weapons while conducting the firm's business.
- Report unsafe conditions or unsafe acts to your supervisor immediately.
- Report occupational illnesses, injuries, and vehicle accidents.
- Do not remove or make ineffective safeguards or safety devices attached to any piece of equipment.
- Report unsafe equipment, defective or frayed electrical cords, and unguarded machinery to your supervisor.
- Shut down and lock out machinery and equipment before cleaning, adjustment, or repair. Do not lubricate or repair moving parts of machinery while the parts are in motion.
- Do not run in the workplace.
- When ascending or descending stairways, use the handrail and take one step at a time.
- Do not apply compressed air to any person or clothing.
- Do not wear steel taps or shoes with metal exposed to the sole at any CH2M HILL project location.
- Do not wear finger rings, loose clothing, wristwatches, and other loose accessories when within arm's reach of moving machinery.
- Remove waste and debris from the workplace and dispose of in accordance with federal, state, and local regulations.
- Note the correct way to lift heavy objects (secure footing, firm grip, straight back, lift with legs), and get help if needed. Use mechanical lifting devices whenever possible.
- Check the work area to determine what problems or hazards may exist.

2.2.2 Personal Hygiene

- Keep hands away from nose, mouth, and eyes.
- Keep areas of broken skin (chapped, burned, etc.) covered.
- Wash hands with hot water and soap frequently prior to eating and smoking.

2.2.3 Substance Abuse

(Reference CH2M HILL SOP HSE-105, *Drug-Free Workplace*)

Employees who work under the influence of controlled substances, drugs, or alcohol may prove to be dangerous or otherwise harmful to themselves, other employees, clients, the company, the company's assets and interests, or the public. CH2M HILL does not tolerate illegal drug use, or any use of drugs, controlled substances, or alcohol that impairs an employee's work performance or behavior. Drug and/or alcohol testing is applicable under CCI and munitions response projects performed in the United States. In addition, employees may be required to submit to drug and/or alcohol testing as

required by clients. When required, this testing is performed in accordance with SOP HSE-105, Drug-Free Workplace. Employees who are enrolled in drug or alcohol testing are required to complete annual training located on the VO.

Prohibitions onsite include:

- Use or possession of intoxicating beverages while performing CH2M HILL work.
- Abuse of prescription or nonprescription drugs.
- Use or possession of illegal drugs or drugs obtained illegally.
- Sale, purchase, or transfer of legal, illegal or illegally obtained drugs.
- Arrival at work under the influence of legal or illegal drugs or alcohol.

2.2.4 Driving

- Always be aware of surroundings while operating a vehicle. Avoid intellectual stress & worries, talking on a cellular phone, eating, drinking, smoking, reading a map, adjusting controls or looking at a passenger while driving.
- Use prudent speed limits, assure that backup warning devices are working, be aware of blind spots or other hazards associated with low visibility, etc. Use a spotter if necessary.
- Do no drive while drowsy. Drowsiness can occur at any time, but is most likely after 18 hours or more without sleep.

2.2.5 Hazard Communication

(Reference CH2M HILL SOP HSE-107, *Hazard Communication)*

The Hazard Communication Coordinator is to perform the following:

- Complete an inventory of chemicals brought on site by CH2M HILL using Attachment 2.
- Confirm that an inventory of chemicals brought on site by CH2M HILL subcontractors is available.
- Request or confirm locations of Material Safety Data Sheets (MSDSs) from the client, contractors, and subcontractors for chemicals to which CH2M HILL employees potentially are exposed.
- Before or as the chemicals arrive on site, obtain an MSDS for each hazardous chemical.
- Label chemical containers with the identity of the chemical and with hazard warnings, and store properly.
- Give employees required chemical-specific HAZCOM training using Attachment 3.
- Store all materials properly, giving consideration to compatibility, quantity limits, secondary containment, fire prevention, and environmental conditions.

2.2.6 Inclement Weather

Sudden inclement weather can rapidly encroach upon field personnel. Preparedness and caution are the best defenses. Field crew members performing work outdoors should carry clothing appropriate for inclement weather. Personnel are to take heed of the weather forecast for the day and pay attention for signs of changing weather that indicate an impending storm. Signs include towering thunderheads, darkening skies, or a sudden increase in wind. If stormy weather ensues, field personnel should discontinue work and seek shelter until the storm has passed.

Protective measures during a lightning storm include seeking shelter; avoiding projecting above the surrounding landscape (don't stand on a hilltop--seek low areas) and ceasing intrusive work inside a

building (i.e. DPT), staying away from open water, metal equipment, railroad tracks, wire fences, and metal pipes; and positioning people several yards apart. Some other general precautions include:

- Know where to go and how long it will take to get there. If possible, take refuge in a large building or vehicle. Do not go into a shed in an open area.
- The inclination to see trees as enormous umbrellas is the most frequent and most deadly mistake. Do not go under a large tree that is standing alone. Likewise, avoid poles, antennae and towers.
- If the area is wide open, go to a valley or ravine, but be aware of flash flooding.
- If you are caught in a level open area during an electrical storm and you feel your hair stand on end, drop to your knees, bend forward and put your hands on your knees or crouch. The idea is to make yourself less vulnerable by being as low to the ground as possible and taking up as little ground space as possible. Lying down is dangerous, since the wet earth can conduct electricity. Do not touch the ground with your hands.
- Do not use telephones during electrical storms, except in the case of emergency

Remember that lightning may strike several miles from the parent cloud, so work should be stopped/restarted accordingly. The lightning safety recommendation is 30-30: Seek refuge when thunder sounds within 30 seconds after a lightning flash; and do not resume activity until 30 minutes after the last thunder clap.

High winds can cause unsafe conditions, and activities should be halted until wind dies down. High winds can also knock over trees, so walking through forested areas during high-wind situations should be avoided. If winds increase, seek shelter or evacuate the area. Proper body protection should be worn in case the winds hit suddenly, because body temperature can decrease rapidly.

2.2.7 Shipping and Transportation of Chemical Products

(Reference CH2M HILL's Procedures for Shipping and Transporting Dangerous Goods)

Chemicals brought to the site might be defined as hazardous materials by the U.S. Department of Transportation (DOT). All staff who ship the materials or transport them by road must receive CH2M HILL training in shipping dangerous goods. All hazardous materials that are shipped (e.g., via Federal Express) or are transported by road must be properly identified, labeled, packed, and documented by trained staff. Contact the RHSM or the Warehouse Coordinator for additional information.

2.2.8 Ultraviolet (UV) Radiation (sun exposure)

Health effects regarding UV radiation are confined to the skin and eyes. Overexposure can result in many skin conditions, including erythema (redness or sunburn), photoallergy (skin rash), phototoxicity (extreme sunburn acquired during short exposures to UV radiation while on certain medications), premature skin aging, and numerous types of skin cancer.

Acute overexposure of UV radiation to the eyes may lead to photokeratitis (inflammation of the cornea), also known as snow blindness. Symptoms include redness of the eyes and a gritty feeling, which progresses to pain and an inability to tolerate any kind of light. This condition can also occur when working in or around water and other UV radiation reflectors. In addition, long-term exposure to sunlight is thought to cause cataracts or clouding of the lens of the eye.

Limit Exposure Time

- Rotate staff so the same personnel are not exposed all of the time.
- Limit exposure time when UV radiation is at peak levels (approximately 2 hours before and after the sun is at its highest point in the sky).

- Avoid exposure to the sun, or take extra precautions when the UV index rating is high.

Provide Shade

- Take lunch and breaks in shaded areas.
- Create shade or shelter through the use of umbrellas, tents, and canopies.
- Fabrics such as canvas, sailcloth, awning material and synthetic shade cloth create good UV radiation protection.
- Check the UV protection of the materials before buying them. Seek protection levels of 95 percent or greater, and check the protection levels for different colors.

Clothing

- Reduce UV radiation damage by wearing proper clothing; for example, long sleeved shirts with collars, and long pants. The fabric should be closely woven and should not let light through.
- Head protection should be worn to protect the face, ears, and neck. Wide-brimmed hats with a neck flap or "Foreign Legion" style caps offer added protection.
- Wear UV-protective sunglasses or safety glasses. These should fit closely to the face. Wrap-around style glasses provide the best protection.

Sunscreen

- Apply sunscreen generously to all exposed skin surfaces at least 20 minutes before exposure, allowing time for it to adhere to the skin.
- Re-apply sunscreen at least every 2 hours, and more frequently when sweating or performing activities where sunscreen may be wiped off.
- Choose a sunscreen with a high sun protection factor (SPF). Most dermatologists advocate SPF 30 or higher for significant sun exposure.
- Waterproof sunscreens should be selected for use in or near water, and by those who perspire sufficiently to wash off non-waterproof products.
- Check for expiration dates, because most sunscreens are only good for about 3 years. Store in a cool place out of the sun.
- Remember—no sunscreen provides 100% protection against UV radiation. Other precautions must be taken to avoid overexposure.

2.2.9 Temperature Extremes

Each employee is responsible for the following:

- Recognizing the symptoms of heat or cold stress
- Taking appropriate precautionary measures to minimize their risk of exposure to temperature extremes
- Communicating any concerns regarding heat and cold stress to their supervisor or SC

2.2.9.1 Heat Stress

General

Physical fitness influences a person's ability to perform work under heat loads. At a given level of work, the more fit a person is, the less the physiological strain, the lower the heart rate, the lower the body temperature (indicates less retrained body heat—a rise in internal temperature precipitates heat injury), and the more efficient the sweating mechanism.

Acclimatization is the degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions. Acclimatization affects their ability to do work. Acclimatized individuals sweat sooner and more profusely than unacclimatized individuals. Acclimatization occurs gradually over 1 to 2 weeks of continuous exposure, but it can be lost in as little as 3 days in a cooler environment.

Dehydration reduces body water volume. This reduces the body's sweating capacity and directly affects its ability to dissipate excess heat.

The ability of a body to dissipate heat depends on the ratio of its surface area to its mass (surface area/weight). **Heat dissipation** is a function of surface area, while heat production depends on body mass. Therefore, overweight individuals (those with a low ratio) are more susceptible to heat-related illnesses because they produce more heat per unit of surface area than if they were thinner. Monitor these persons carefully if heat stress is likely.

When wearing **impermeable clothing**, the weight of an individual is not as important in determining the ability to dissipate excess heat because the primary heat dissipation mechanism, evaporation of sweat, is ineffective.

SYMPTOMS AND TREATMENT OF HEAT STRESS					
	Heat Syncope	Heat Rash	Heat Cramps	Heat Exhaustion	Heat Stroke
Signs and Symptoms	Sluggishness or fainting while standing erect or immobile in heat.	Profuse tiny raised red blister-like vesicles on affected areas, along with prickling sensations during heat exposure.	Painful spasms in muscles used during work (arms, legs, or abdomen); onset during or after work hours.	Fatigue, nausea, headache, giddiness; skin clammy and moist; complexion pale, muddy, or flushed; may faint on standing; rapid thready pulse and low blood pressure; oral temperature normal or low	Red, hot, dry skin; dizziness; confusion; rapid breathing and pulse; high oral temperature.
Treatment	Remove to cooler area. Rest lying down. Increase fluid intake. Recovery usually is prompt and complete.	Use mild drying lotions and powders, and keep skin clean for drying skin and preventing infection.	Remove to cooler area. Rest lying down. Increase fluid intake.	Remove to cooler area. Rest lying down, with head in low position. Administer fluids by mouth. Seek medical attention.	Cool rapidly by soaking in cool–but not cold–water. Call ambulance, and get medical attention immediately!

Precautions

- Drink 16 ounces of water before beginning work. Disposable cups and water maintained at 50°F to 60°F should be available. Under severe conditions, drink 1 to 2 cups every 20 minutes, for a total of 1 to 2 gallons per day. Do not use alcohol in place of water or other nonalcoholic fluids. Decrease your intake of coffee and caffeinated soft drinks during working hours.
- Acclimate yourself by slowly increasing workloads (e.g., do not begin with extremely demanding activities).

- Use cooling devices, such as cooling vests, to aid natural body ventilation. These devices add weight, so their use should be balanced against efficiency.
- Use mobile showers or hose-down facilities to reduce body temperature and cool protective clothing.
- Conduct field activities in the early morning or evening and rotate shifts of workers, if possible.
- Avoid direct sun whenever possible, which can decrease physical efficiency and increase the probability of heat stress. Take regular breaks in a cool, shaded area. Use a wide-brim hat or an umbrella when working under direct sun for extended periods.
- Provide adequate shelter/shade to protect personnel against radiant heat (sun, flames, hot metal).
- Maintain good hygiene standards by frequently changing clothing and showering.
- Observe one another for signs of heat stress. Persons who experience signs of heat syncope, heat rash, or heat cramps should consult the SC to avoid progression of heat-related illness.

Thermal Stress Monitoring

The following procedures should be implemented when the ambient air temperature exceeds 70° F, the relative humidity is high (greater than 50 percent), or when the workers exhibit symptoms of heat stress.

- The heart rate should be measured by the radial pulse for 30 seconds, as early as possible in the resting period.
- The heart rate at the beginning of the rest period should not exceed 110 beats per minute, or 20 beats per minute above resting pulse.
- If the heart rate is higher, the next work period should be shortened by 33 percent, while the length of the rest period stays the same.
- If the pulse rate still exceeds 110 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33 percent.
- Continue this procedure until the rate is maintained below 110 beats per minute, or 20 beats per minute above resting pulse.
- Alternately, the oral temperature can be measured before the workers have something to drink.
- If the oral temperature exceeds 99.6 degrees F at the beginning of the rest period, the following work cycle should be shortened by 33 percent.
- Continue this procedure until the oral temperature is maintained below 99.6 degrees F. While an accurate indication of heat stress, oral temperature is difficult to measure in the field.

2.2.9.2 Cold

General

Low ambient temperatures increase the heat lost from the body to the environment by radiation and convection. In cases where the worker is standing on frozen ground, the heat loss is also due to conduction.

Wet skin and clothing, whether because of water or perspiration, may conduct heat away from the body through evaporative heat loss and conduction. Thus, the body cools suddenly when chemical protective clothing is removed if the clothing underneath is perspiration soaked.

Movement of air across the skin reduces the insulating layer of still air just at the skin's surface. Reducing this insulating layer of air increases heat loss by convection.

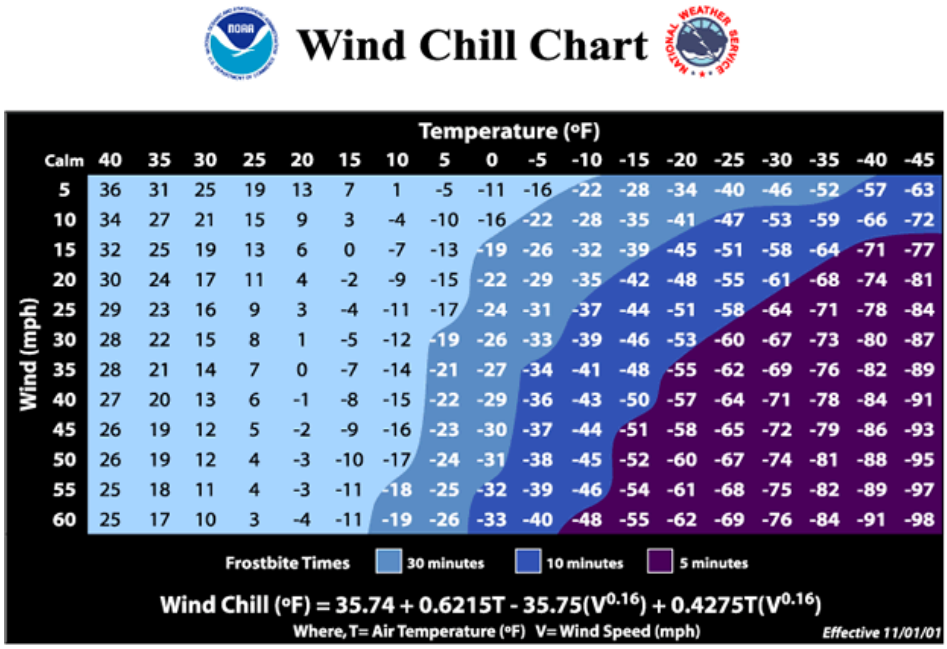
Non-insulating materials in contact or near-contact with the skin, such as boots constructed with a metal toe or shank, conduct heat rapidly away from the body.

Certain common drugs, such as alcohol, caffeine, or nicotine, may exacerbate the effects of cold, especially on the extremities. These chemicals reduce the blood flow to peripheral parts of the body, which are already high-risk areas because of their large surface area to volume ratios. These substances may also aggravate an already hypothermic condition.

Precautions

- Be aware of the symptoms of cold-related disorders, and wear proper, layered clothing for the anticipated fieldwork. Appropriate rain gear is a must in wet weather.
- Consider monitoring the work conditions and adjusting the work schedule using guidelines developed by the U.S. Army (wind-chill index) and the National Safety Council (NSC).
- Wind-Chill Index (below) is used to estimate the combined effect of wind and low air temperatures on exposed skin. The wind-chill index does not take into account the body part that is exposed, the level of activity, or the amount or type of clothing worn. For those reasons, it should only be used as a guideline to warn workers when they are in a situation that can cause cold-related illnesses.
- NSC Guidelines for Work and Warm-Up Schedules can be used with the wind-chill index to estimate work and warm-up schedules for fieldwork. The guidelines are not absolute; workers should be monitored for symptoms of cold-related illnesses. If symptoms are not observed, the work duration can be increased.
- Persons who experience initial signs of immersion foot, frostbite, and/or hypothermia should report it immediately to their supervisor/PM to avoid progression of cold-related illness.
- Observe one another for initial signs of cold-related disorders.
- Obtain and review weather forecast – be aware of predicted weather systems along with sudden drops in temperature, increase in winds, and precipitation.

SYMPTOMS AND TREATMENT OF COLD STRESS			
	Immersion (Trench) Foot	**Frostbite**	**Hypothermia**
Signs and Symptoms	Feet discolored and painful; infection and swelling present.	Blanched, white, waxy skin, but tissue resilient; tissue cold and pale.	Shivering, apathy, sleepiness; rapid drop in body temperature; glassy stare; slow pulse; slow respiration.
Treatment	Seek medical treatment immediately.	Remove victim to a warm place. Re-warm area quickly in warm–but **not** hot–water. Have victim drink warm fluids, but **not** coffee or alcohol. Do not break blisters. Elevate the injured area, and get medical attention.	Remove victim to a warm place. Have victim drink warm fluids, but **not** coffee or alcohol. Get medical attention.



2.3 Biological Hazards and Controls

2.3.1 Africanized Honey Bees

Africanized honey bees are present in the Phoenix, Arizona area and other parts of the southwestern United States. The following precautions should be taken:

- Aside from watching for nests, be extra careful when moving discarded materials on the ground.
- Be alert for bees that appear to be acting more aggressive or strange.
- If bees begin to fly at your face or buzz around over your head, quickly retrace your steps and leave the area immediately. Report this occurrence to your DSC and fellow workers at the site. Avoid this area until instructed that it is safe to reenter.
- Wear light colored clothing as dark clothing/colors appears to attract and anger bees.
- Avoid wearing any type of aftershave or perfume. This may also attract bees.
- If swarmed by bees, run quickly to an enclosed shelter. Do not stop to pickup belongings or materials. Do not flail at bees as this will increase their attack, but cover head and face as best able.
- Once away from bees evaluate your condition. If you have been stung more than 15 times or if you are having any symptoms other than local pain and swelling, seek medical attention immediately.
- If stung, do not pull out stingers but use a credit card to scrape the stringers off. Pulling them only injects more of the venom.

Africanized honey bees are very similar to their European cousins. It is very difficult for laymen to tell the difference. The venom's of the 2 species are the same, they can only sting once, they pollinate flowers, produce honey and wax and will defend their colony. The big differences are that AHB's tend to be more aggressive in response to a threat of the nest, can sense a threat from 50 feet or more, can sense power equipment vibrations (drilling/excavation), and may pursue a perceived enemy for a ¼ mile.

On the other hand, remember that bees on flowers are working and are likely away from the colony. They are not as likely to sting or be aggravated by your presence if left undisturbed.

2.3.2 Black Bears

Bears may inhabit wooded areas where there is scarce continuous human presence. Make your presence known-especially when vegetation and terrain make it hard to see. Make noise, sing, or talk loudly. Avoid thick brush. Try to walk with the wind at your back so your scent will warn bears of your presence.

Give bears plenty of room. Every bear has a "personal space" - the distance within which a bear feels threatened – that can be from a few feet to a few hundred feet. If you stray within that zone, a bear may act aggressively. Never approach bears, even if only out of curiosity, and never attempt to feed bears.

If a bear cannot recognize you, he may come closer or stand on his hind legs for a better view. You may try to back away slowly diagonally, but if the bear follows, stop and stand your ground. If the bear moves closer or acts aggressively, stay close together and wave your arms and shout.

Do not climb a tree – black bears are good climbers.

Do not run. Bears have been clocked at speeds of up to 35 mph, and like dogs, will chase fleeing animals. Bears often make bluff charges, sometimes up to 10 feet away without making contact. Continue waving your arms and shouting. Never imitate bears sounds or use high-pitched squeals.

If attacked, do not run. Clasp your hands tightly over the back of your neck or if you are carrying a backpack use it to protect your head and neck and remain still.

For Black bears, if the attack lasts for more than a few seconds, respond aggressively - use sticks, rocks, your fists or noise. Black bears will sometimes back off if they are challenged.

2.3.3 Bees and Other Stinging Insects

Bees and other stinging insects may be encountered almost anywhere and may present a serious hazard, particularly to people who are allergic. Watch for and avoid nests. Keep exposed skin to a minimum. Carry a kit if you have had allergic reactions in the past, and inform your supervisor and/or buddy. If a stinger is present, remove it carefully with tweezers. Wash and disinfect the wound, cover it, and apply ice. Watch for allergic reaction; contact the occupational nurse at 1-866-893-2514 immediately if a reaction develops or 911 if the reaction is severe.

2.3.4 Bloodborne Pathogens

(Reference CH2M HILL SOP HSE-202, *Bloodborne Pathogens*)

Exposure to bloodborne pathogens may occur when rendering first aid or CPR, or when coming into contact with landfill waste or waste streams containing potentially infectious material (PIM).

- Employees trained in first-aid/CPR or those exposed to PIM must complete CH2M HILL's 1-hour bloodborne computer-based training module annually.
- Hepatitis B vaccine (HBV) is offered to employees who may be exposed to PIM when they complete training and within 10 working days of assignment. (Note: Employees whose exposure stems only from rendering first aid as a collateral duty receives the vaccine after exposure.)
- Employees who decline the HBV vaccine must sign the declination form (contact regional Safety Program Assistant [SPA]) indicating they declined the vaccination. Anyone who declines the vaccination and chooses to receive the vaccination at a later time may still receive the vaccination by contacting the SPA.

- Hepatitis B and tetanus vaccinations can be requested by completing the medical portion of the enrollment form, located under Tools & Forms at the HS&E web page, or by contacting the regional SPA.

Work Controls

- Observe universal precautions to prevent contact with blood or other PIMs. Where differentiation between body fluid types is difficult or impossible, consider all body fluids to be potentially infectious materials.
- Consider all sharps encountered at industrial, medical, dental, or biological waste facilities or sampling locations to be contaminated and PIMs.
- Always wash your hands and face with soap and running water after contacting PIMs. If washing facilities are unavailable, use an antiseptic cleanser with clean paper towels or moist towelettes. These must be provided for employees who have been exposed to PIMs. When antiseptic cleansers or towelettes are used, always rewash your hands and face with soap and running water as soon as available. Do not consume food or beverages until after thoroughly washing your hands and face.
- Decontaminate all potentially contaminated equipment and environmental surfaces with chlorine bleach as soon as possible. Clean and decontaminate on a regular basis (and immediately upon visible contamination) all bins, pails, cans, and other receptacles intended for reuse that have the potential for becoming contaminated.
- Use one part chlorine bleach (5.25 percent sodium hypochlorite solution) diluted with 10 parts water for decontaminating equipment or surfaces after initially removing blood or other PIMs. Remove contaminated PPE as soon as possible before leaving a work area.
- Place regulated waste in containers that are closable; are constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping; are labeled with a Biological warning label or color-coded; and are tightly closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

Employees who participate in waste characterization studies, sort or sample refuse, or contact medical, dental, or biological waste streams should follow these procedures:

- If exposure is anticipated, this group of employees should wear safety goggles or glasses, puncture-resistant utility gloves with inner latex glove liners, Tyvek coveralls or cotton coveralls with a rubber apron, and puncture-resistant shoes or boots.
- If splash potential is present, employees should wear a full-face shield.
- If a respiratory hazard is present, a full-face respirator with HEPA filters should be worn.

Post Exposure

CH2M HILL will provide exposed employees with a confidential medical examination should an exposure to PIM occur. This examination includes the following procedures:

- Documenting the exposure
- Testing the exposed employee's and the source individual's blood (with consent)
- Administering post-exposure prophylaxis

2.3.5 Bird Droppings

Large populations of roosting birds may present a disease risk. The most serious health risks arise from disease organisms that grow in the nutrient-rich accumulations of bird droppings, feathers and debris

under a roost — particularly if roosts have been active for years. In addition, insects that live on birds or their droppings may become a problem when the infested birds leave roosts or nests.

Histoplasmosis and cryptococcosis are caused by fungi. The diseases are transmitted to humans by airborne fungus spores from soil contaminated by pigeon and other bird/bat droppings. Most infections are mild and produce either no symptoms or a minor influenza-like illness. On occasion, the diseases can cause high fever, blood abnormalities, pneumonia and even death.

The best way to prevent exposure to fungus spores is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. A brief inhalation exposure to highly contaminated dust may be all that is needed to cause infection and subsequent development of fungal disease. Therefore, work practices and dust control measures that eliminate or reduce dust generation during the removal of bat or bird manure from a building will also reduce risks of infection and subsequent development of disease.

If disturbing the droppings or removal is necessary, follow these controls:

- Use dust control measures (wetting with water or HEPA vacuuming) for all activities that may generate dust form the accumulated droppings.
- Wear Tyvek with hoods, disposable gloves and booties, and air-purifying respirators with a minimum N95 rating.
- Put droppings into plastic/poly bags and preferably into a 55-gallon drum to prevent bag from ripping

2.3.6 Cougars/Mountain Lions

Like bears, cougars will often retreat if given the opportunity. Walking in groups and making noise will give the cougar the chance to retreat and reduce the likelihood of a sudden encounter. Be especially cautious during dusk and dawn.

If you see a cougar—do not play dead, do not run. Running may trigger an attack. Face the cougar and retreat slowly maintaining eye contact. If the cougar continues advancing, raise your arms above your head to make yourself look larger than normal. This may help to intimidate the cougar. Sometimes aggressive yelling and rock throwing may scare it off.

If attacked, fight back with whatever is at hand (without turning your back)—people have utilized rocks, jackets, garden tools, tree branches, and even bare hands to turn away cougars.

2.3.7 Coyotes

Coyotes are found in some areas of the base. While far from domesticated, coyotes show little fear of humans and have become comfortable living in close proximity to our communities. Although they tend to do most of their hunting after dusk, coyotes can be active at any time. Under normal circumstances, a coyote is not a danger to humans. They are, however, territorial and will respond aggressively if they or their family are threatened.

If you encounter a coyote that behaves aggressively, you have probably gotten too close to its prey or its family. Try to scare the coyote by yelling and waving your arms. Throw rocks, sticks or other objects. Do not turn away and run.

2.3.8 Feral Dogs

Avoid all dogs – both leashed and stray. Do not disturb a dog while it is sleeping, eating, or caring for puppies. If a dog approaches to sniff you, stay still. An aggressive dog has a tight mouth, flattened ears and a direct stare. If you are threatened by a dog, remain calm, do not scream and avoid eye contact. If you say anything, speak calmly and firmly. Do not turn and run, try to stay still until the dog leaves, or

back away slowly until the dog is out of sight or you have reached safety (e.g. vehicle). If attacked, retreat to vehicle or attempt to place something between you and the dog. If you fall or are knocked to the ground, curl into a ball with your hands over your head and neck and protect your face. If bitten, immediately scrub the bite site vigorously with soap and water. Report the incident to the local authorities. Seek medical attention as soon as possible.

2.3.9 Hanta Virus

Hantavirus pulmonary syndrome (HPS) is a rare disease caused by a virus which can be transmitted from certain rodents to humans. Symptoms may develop between 14 and 31 days after exposure to infected rodents and their droppings and body fluids. Early symptoms include fatigue, fever, and muscle aches, especially the large muscle groups--thighs, hips, back and sometimes shoulders. These symptoms are universal. About half of all HPS patients also experience headaches, dizziness, chills and/or abdominal pain. Four to 10 days after the initial phase of the illness, late symptoms of HPS may appear. These include coughing and shortness of breath, with the sensation of, as one survivor put it, a "... tight band around my chest and a pillow over my face" as the lungs fill with fluid, which can cause pulmonary shock, failure and death. If you develop symptoms suggestive of HPS, call the occupational nurse at 1-866-893-2514.

The presence of hantavirus is recognized throughout the Southwest United States. Human infection may occur when infected saliva or excreta are inhaled as aerosols produced directly from the animal. Transmission may also occur when dried materials contaminated by rodent excreta are disturbed, directly introduced into broken skin, introduced onto the eye, or ingested in contaminated food or water. Personnel have also become infected after being bitten by rodents. In New Mexico, the Deer Mouse is the main carrier of the virus, with the Cotton Rat and the White-Footed and Brush Mice also identified as carriers. Therefore, all wild mice and rats should be considered potential Hantavirus carriers. Researchers do not believe that Hantavirus is transmitted to humans by any other types of animals besides rodents. There is currently no evidence that squirrels or rabbits carry Hantavirus. Dogs and cats do not carry the virus, but they may bring home infected rodents.

Inspect each crawlspace for evidence of rodents. If there is evidence, take precautions before and during clean up of rodent-infested areas. Before cleaning, attempt to trap the rodents and prevent entry. Spring-loaded traps that kill rodents are the preferred method. If you must reuse the traps, spray them thoroughly with bleach (1:10 with water) or other commercial disinfectant mixture. Dispose of trapped or deceased rodents carefully according to the guidelines detailed below. Do not trap rodents live, nor use glueboards or rodenticides. Mice that are poisoned may die in an inaccessible place, and Hantavirus can be released as the rodent decomposes.

Continue trapping operations as long as possible. If no rodents are captured, the active infestation has most likely been eliminated.

PPE shall include:

- Tyvek coveralls;
- Rubber boots or disposable shoe covers;
- Rubber, latex, or vinyl gloves;
- Protective goggles;
- Respiratory protection such as a full face or half-mask air-purifying respirator with a high-efficiency particulate air (HEPA) filter.

Before starting clean up of the space, ventilate the space for at least 30 minutes to allow fresh air to enter the area. Use cross-ventilation and leave the space during the airing-out period.

Spray any urine, droppings, and nesting materials with either a bleach and water solution (1 parts bleach to 9 parts water) or a household disinfectant prepared according to the label instructions for dilution and disinfection time. Soak well and let stand for 15 minutes. This will inactivate any virus. Use a paper towel or rag to pick up the materials and dispose of them.

Mop floors (if basement floor) after spraying them using bleach/water solution or a disinfectant. Dirt floors can be sprayed with either bleach and water solution or a disinfectant.

Personal protective gear should be decontaminated upon removal at the end of the day. All potentially infective waste material (including respirator filters) from clean-up operations shall be double-bagged in appropriate plastic bags.

2.3.10 Mosquito Bites

Due to the recent detection of the West Nile Virus in the Southwestern United States it is recommended that **preventative measures** be taken to reduce the probability of being bitten by mosquitoes whenever possible. Mosquitoes are believed to be the primary source for exposure to the West Nile Virus as well as several other types of encephalitis. The following guidelines should be followed to reduce the risk of these concerns for working in areas where mosquitoes are prevalent.

- Stay indoors at dawn, dusk, and in the early evening.
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing.
- Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N,N-diethyl-meta-toluamide). Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands.
- Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.
- Note: Vitamin B and "ultrasonic" devices are NOT effective in preventing mosquito bites.

Symptoms of Exposure to the West Nile Virus

Most infections are mild, and symptoms include fever, headache, and body aches, occasionally with skin rash and swollen lymph glands. More severe infection may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and, rarely, death.

The West Nile Virus incubation period is from 3-15 days.

Contact the project RHSM with questions, and immediately report any suspicious symptoms to your supervisor/PM and contact the occupational nurse at 1-866-893-2514.

2.3.11 Poison Ivy, Poison Oak, and Poison Sumac

Poison ivy, poison oak, and poison sumac typically are found in brush or wooded areas. They are more commonly found in moist areas or along the edges of wooded areas. Shrubs are usually 12 to 30 inches high, or can also be a tree-climbing vine, with triple leaflets and short, smooth hair underneath. Plants are red and dark green in Spring and Summer, with yellowing leaves anytime especially in dry areas. Leaves may achieve bright reds in Fall, but plants lose its (yellowed, then brown) leaves in Winter, leaving toxic stems. All parts of the plant remain toxic throughout the seasons. These plants contain urushiol (you-ROO-shee-ol), a colorless or pale yellow oil that oozes from any cut or crushed part of the

plant, including the roots, stems and leaves and causes allergic skin reactions when contacted. The oil is active year round.

Become familiar with the identity of these plants (see below). Wear protective clothing that covers exposed skin and clothes. Avoid contact with plants and the outside of protective clothing. If skin contacts a plant, wash the area with soap and water immediately. If the reaction is severe or worsens, seek medical attention.

Poison Ivy

Poison Sumac

Poison Oak

Contamination with poison ivy, sumac or oak can happen through several pathways, including:

- Direct skin contact with any part of the plant (even roots once above ground foliage has been removed).
- Contact with clothing that has been contaminated with the oil.
- Contact from removing shoes that have been contaminated (shoes are coated with urishol oil).
- Sitting in a vehicle that has become contaminated.
- Contact with any objects or tools that have become contaminated.
- Inhalation of particles generated by weed whacking, chipping, vegetation clearing.

If you must work on a site with poison ivy, sumac or oak the following precautions are necessary:

- Do not drive vehicles onto the site where it will come into contact with poison ivy, sumac or oak. Vehicles which need to work in the area, such as drill rigs or heavy equipment must be washed as soon as possible after leaving the site.
- All tools used in the poison ivy, sumac or oak area, including those used to cut back poison oak, surveying instruments used in the area, air monitoring equipment or other test apparatus must be decontaminated before they are placed back into the site vehicle. If on-site decontamination is not possible, use plastic to wrap any tools or equipment until they can be decontaminated.
- Personal protective equipment, including Tyvek coveralls, gloves, and boot covers must be worn. PPE must be placed into plastic bags and sealed if they are not disposed immediately into a trash receptacle.
- As soon as possible following the work, shower to remove any potential contamination. Any body part with suspected or actual exposure should be washed with "Tecnu" or other product designed for removing urushiol. If you do not have Tecnu wash with cold water. Do not take a bath, as the oils can form and invisible film on top of the water and contaminate your entire body upon exiting the bath.
- Tecnu may also be used to decontaminate equipment.

- Use IvyBlock or similar products to prevent poison oak, ivy and sumac contamination. Check with the closest CH2M HILL warehouse to see if these products are available. Follow all directions for application.

If you do come into contact with one of these poisonous plants and a reaction develops, contact your supervisor and the occupational nurse 1-866-893-2514.

2.3.12 Snakes

Snakes typically are found in underbrush and tall grassy areas. If you encounter a snake, stay calm and look around; there may be other snakes. Turn around and walk away on the same path you used to approach the area. If a person is bitten by a snake, wash and immobilize the injured area, keeping it lower than the heart if possible. Call the occupational nurse at 1-866-893-2514 immediately. **DO NOT** apply ice, cut the wound, or apply a tourniquet. Try to identify the type of snake: note color, size, patterns, and markings.

2.3.13 Spiders - Brown Recluse

It is regarded by many as the most dangerous spider in the United States. Because of interstate shipping/transportation, the Brown Recluse spider can be found most anywhere in the United States. Brown Recluse Spiders are usually 1 inch or larger in size, including the legs and can grow as large as 3 inches. Young Brown Recluse spiders are smaller. Brown recluse spider bites don't always hurt right away. away. In fact, you may not know that you have been bitten until other symptoms appear. Symptoms of a brown recluse spider bite may include the following:

- Reddened skin followed by a blister that forms at the bite site.
- Mild to intense pain and itching for 2 to 8 hours following the bite.
- An open sore with a breakdown of tissue (necrosis) that develops within a few hours to 3 to 4 days following the bite and the area may become painful, itchy, hot, swollen, red and tender. An irregular ulcerous sore, caused by necrosis, will often appear that is from 1/4 inch to 10 inches in diameter. Prompt attention is the best defense against preventing the necrosis. The wound is often described as being reddish and surrounded by a bluish area with a narrow whitish separation in between the red and the blue. This gives it the famous "bull's eye" pattern. In just hours, a bite from the highly venomous Brown Recluse spider can create blisters and cause tissue damage.

Some people have a severe, systemic (whole-body) reaction to brown recluse spider bites, including the rapid destruction of red blood cells and anemia. Signs and symptoms include:

Fever and chills.

- Skin rash all over the body with many tiny, flat purple and red spots.
- Nausea or vomiting.
- Joint pain.

If you think you have been bitten by a brown recluse spider:

- Remain calm. Too much excitement or movement will increase the flow of venom into the blood.
- Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider.

- Apply a cool, wet cloth to the bite or cover the bite with a cloth and apply an ice bag to the bite.
- Do not apply a tourniquet. It may cause more harm than benefit.
- Try to positively identify the spider to confirm its type.
- Seek prompt medical attention.

A brown recluse bite can be serious and will likely require immediate medical care. Seek medical attention if you believe you have been bitten by a recluse spider, especially if severe symptoms develop throughout your body or an open sore and necrosis develop. A brown recluse spider bite is diagnosed through a physical examination and questions about the bite. You should be prepared to describe the spider, where and when the bite took place, and what you were doing at the time. Your health professional will ask what your main symptoms are, when they began, and how they have developed, progressed, or changed since the bite.

2.3.14 Widow Spiders

The Northern Black Widow spider may be encountered in Northern Regions of the United States. Other similar widow spiders are the Red Widow and the Brown Widow. Female widow spiders range from 8-15 mm in body length; males are smaller, sometimes very small (2 mm). Most have globose, shiny abdomens that are predominantly black with red markings (although some may be pale and/or have lateral stripes), with moderately long, slender legs. These spiders are nocturnal and build a three-dimensional tangled web, often with a conical tent of dense silk in a corner where the spider hides during the day. In nature, most species are found under rocks and logs, but they readily adapt to human-altered environments, where they are most commonly found in outbuildings (sheds, barns, privies), water meter holes, nursery cans, and under any item or structure (*e.g.*, barbeque grill, slide, sand box) that has been undisturbed for a lengthy period. Formerly, most bites by black widows (almost all by female spiders) occurred in outhouses, but presently, widow bites occur most frequently when the spider is trapped against human skin, either by reaching under objects where the spider is hiding or when putting on clothing, gloves or shoes containing the spider. Widow spiders are generally very timid and only bite in self-defense when they accidentally contact humans.

Black Widow

Red Widow

Brown Widow

Bite symptoms are systemic, spreading through the lymphatic system, and usually start about 1-3 hours after the bite. The most common symptoms are intense pain, rigid abdominal muscles, muscle cramping, malaise, local sweating, nausea, vomiting, and hypertension. Other symptoms may includetremors, labored breathing, restlessness, increased blood pressure, and fever. If left untreated, widow bite symptoms usually last 3-5 days.

If bitten, remain calm, and immediately seek medical attention (contact your physician, hospital and/or poison control center). Apply an ice pack directly to the bite area to relieve swelling and pain. Try to collect the spider, without being bitten, (even a mangled specimen has diagnostic value), if possible, for positive identification by a spider expert. A plastic bag, small jar, or pill vial is useful and no preservative is necessary, but rubbing alcohol helps to preserve the spider. A hospital stay may be recommended, particularly for those with a heart condition or with health problems. A physician may

administer a specific antivenin to counteract the venom or calcium gluconate to relieve pain. Calcium gluconate and/or antivenin may be administered to relieve or counteract symptoms.

2.3.15 Scorpions

Basic Information

Only a very small number of the over 1050 known species are dangerous to humans. Most produce a bee-sting like reaction in humans. It is very painful, but not life-threatening. Scorpions are part of the natural environment. Most in the U.S. are not dangerously harmful; however, it is also important to remember that even a nearly nontoxic species can cause death if the victim has a severe allergic reaction to the venom.

Symptoms

Some components in scorpion venom appear to have no other function than to cause localized pain or discomfort in the victim. In vertebrates, the systemic effects observed after scorpion envenomation are probably the result of the release of massive quantities of catecholamines from the victim's adrenal glands. The scorpion's venom, therefore, is not directly responsible for the severe manifestations we see in some cases. Instead, the neurotoxins induce the victim's own chemical communication system to destroy the victim's homeostatic functions.

Scorpions not considered of any medical importance (typical Southern Calif. Species) normally have venoms that are of low toxicity. These scorpions normally produce a localized reaction similar to that a honeybee sting. They would have to be several feet long before they could produce and inject enough venom into a person to kill them.

The presence of pre-existing medical conditions such as pneumonia, hypertension, and certain heart ailments can turn otherwise normal systemic reactions into life threatening situations. Persons with such conditions are at greater risk of severe envenomation than are healthy persons. Some people are allergic to scorpion venom in the same way that some are allergic to honey bee venom. In such cases, very severe effects, including death, can occur very rapidly and are not related to the toxicity of the venom. Deaths due to envenomation by non-medically important species are usually the result of allergy induced anaphylactic shock.

Envenomations are usually categorized into two or three levels of severity: 1) localized effects, 2) systemic effects, and 3) systemic effects with central nervous system involvement. Localized effects are common to nearly all scorpion stings regardless of the toxicity of the venom. These symptoms are restricted to the site of sting and include intense pain, minor swelling, redness or induration, numbness, tenderness, and tingling. Intense pain normally subsides within one hour, giving way to numbness, tenderness, and tingling at the site of the sting. This normally results in the favoring of an affected limb. These symptoms normally fade after 24 hours.

If you are stung by a scorpion, call the occupational nurse 1-866-893-2514 and try to note the description of the scorpion

Prevention

When entering an area that has the potential to contain scorpions, the following PPE is recommended: long pants, long sleeved shirts with collars, hard hat with brim, leather work gloves and leather work boots. Reaching into enclosures or recesses without prior visual inspection is not recommended. Thoroughly inspect each area before accessing.

2.3.16 Ticks

Every year employees are exposed to tick bites at work and at home putting them at risk of illness. Ticks typically are in wooded areas, bushes, tall grass, and brush. Ticks are black, black and red, or brown and can be up to one-quarter inch in size.

In some geographic areas exposure is not easily avoided. Wear tightly woven light-colored clothing with long sleeves and pant legs tucked into boots; spray **only outside** of clothing with permethrin or permanone and spray skin with only DEET; and check yourself frequently for ticks.

Where site conditions warrant (vegetation above knee height, tick endemic area) or when tasks warrant (e.g., having to sit/kneel in vegetation) that diminish the effectiveness of the other controls mentioned above, bug-out suits (obtained from MKE warehouse)/Tyvek shall be used. Bug-out suits are more breathable than Tyvek.

Take precautions to avoid exposure by including pre-planning measures for biological hazards prior to starting field work. Contact the MKE Warehouse for preventative equipment such as repellants, protective clothing and tick removal kits. Use the buddy system and perform tick inspections prior to entering the field vehicle. If ticks were not planned to be encountered and are observed, do not continue field work until these controls can be implemented.

See Tick Fact Sheet attached to this HSP for further precautions and controls to implement when ticks are present. Information includes the procedure for submitting a removed tick for testing. If bitten by a tick, follow the removal procedures found in the tick fact sheet, call the occupational nurse at 1-866-893-2514.

Be aware of the symptoms of Lyme disease or Rocky Mountain spotted fever (RMSF). Lyme: a rash might appear that looks like a bullseye with a small welt in the center. RMSF: a rash of red spots under the skin 3 to 10 days after the tick bite. In both RMSF and Lyme disease, chills, fever, headache, fatigue, stiff neck, and bone pain may develop. If symptoms appear, again contact the occupational nurse at 1-866-893-2514.

Be sure to complete an Incident Report (either use the HITS system on the VO) or see Attachment 5 if you do come in contact with a tick. For more detailed information go to HSSE website or contact the RHSM.

2.4 Radiological Hazards and Controls

Refer to CH2M HILL's Core Standard, Radiological Control and Radiological Controls Manual for additional requirements. No Hazards are identified.

2.5 Contaminants of Concern

(Refer to Project Files for more detailed contaminant information)

Contaminant	Location and Maximum[a] Concentration	Exposure Limit[b]	IDLH[c]	Symptoms and Effects of Exposure	PIP[d] (eV)
Benzene	Potential	0.5 ppm	500 Ca	Eye, nose, skin, and respiratory irritation; headache; nausea; dermatitis; fatigue; giddiness; staggered gait; bone marrow depression	9.24
Ethyl Benzene	Potential	100 ppm	800	Eye, skin, and mucous membrane irritation; headache; dermatitis; narcotic; coma	8.76
Toluene	Potential	50 ppm	500	Eye and nose irritation, fatigue, weakness, confusion, dizziness, headache, dilated pupils, excessive tearing, nervousness, muscle fatigue, paresthesia, dermatitis, liver and kidney damage	8.82
Xylenes	Potential	100 ppm	900	Irritated eyes, skin, nose, and throat; dizziness; excitement; drowsiness; incoherence; staggering gait; corneal vacuolization; anorexia; nausea; vomiting; abdominal pain; dermatitis	8.56
Gasoline Range Organics	Potential	300 ppm	ND Ca	Eye, skin and mucous membrane irritation; dermatitis, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, convulsions, chemical pneumonia on aspiration, possible liver and kidney damage	UK

Footnotes:

[a] Specify sample-designation and media: SB (Soil Boring), A (Air), D (Drums), GW (Groundwater), L (Lagoon), TK (Tank), S (Surface Soil), SL (Sludge), SW (Surface Water).

[b] Appropriate value of PEL, REL, or TLV listed.

[c] IDLH = immediately dangerous to life and health (units are the same as specified "Exposure Limit" units for that contaminant); NL = No limit found in reference materials; CA = Potential occupational carcinogen.

[d] PIP = photoionization potential; NA = Not applicable; UK = Unknown.

2.6 Potential Routes of Exposure

Dermal: Contact with contaminated media. This route of exposure is minimized through proper use of PPE, as specified in Section 4.	**Inhalation:** Vapors and contaminated particulates. This route of exposure is minimized through proper respiratory protection and monitoring, as specified in Sections 4 and 5, respectively.	**Other:** Inadvertent ingestion of contaminated media. This route should not present a concern if good hygiene practices are followed (e.g., wash hands and face before drinking or smoking).

3.0 Project Organization and Personnel

3.1 CH2M HILL Employee Medical Surveillance and Training

(Reference CH2M HILL- SOPs HSE-113, *Medical Surveillance*, and HSE-110, *Training*)

3.1.1 Hazardous Waste Operations Training

All employees engaging in hazardous waste operations or emergency response shall receive appropriate training as required by 29 CFR 1910.120 and 29 CFR 1926.65. At a minimum, the training shall have consisted of instruction in the topics outlined in the 29 CFR 1910.120 and 29 CFR 1926.65. Personnel who have not met these training requirements shall not be allowed to engage in hazardous waste operations or emergency response activities.

3.1.1.1 Initial Training

General site workers engaged in hazardous waste operations shall, at the time of job assignment, have received a minimum of 40 hours of initial health and safety training for hazardous waste site operations, unless otherwise noted in the above-referenced standards.

Employees who may be exposed to health hazards or hazardous substances at treatment, storage, and disposal (TSD) operations shall receive a minimum of 24 hours of initial training to enable the employee to perform their assigned duties and functions in a safe and healthful manner.

Employees engaged in emergency response operations shall be trained to the level of required competence in accordance with 29 CFR 1910.120.

3.1.1.2 Three-Day Actual Field Experience

General site workers for hazardous waste operations shall have received three days of actual experience (on-the-job training) under the direct supervision of a trained, qualified supervisor and shall be documented. If the field experience has not already been received and documented at a similar site, this supervised experience shall be accomplished and documented at the beginning of the assignment of the project.

3.1.1.3 Refresher Training

General site workers and TSD workers shall receive 8-hours of refresher training annually (within the previous 12-month period) to maintain qualifications for fieldwork. Employees engaged in emergency response operations shall receive annual refresher training of sufficient content and duration to maintain their competencies or shall demonstrate competency in those areas at least annually.

3.1.1.4 Eight-Hour Supervisory Training

On site management or supervisors who will be directly responsible for, or supervise employees engaged in hazardous waste site operations, will have received at least 8 hours of additional specialized training on managing such operations. Employees designated as SC-HW employees are considered 8-hour HAZWOPER Site Safety Supervisor trained.

The employees listed meet state and federal hazardous waste operations requirements for 40-hour initial training, 3-day on-the-job experience, and 8-hour annual refresher training. Employees designated "SC" have completed a 12-hour site safety coordinator course, and have documented requisite field experience. An SC with a level designation (D, C, B) equal to or greater than the level of protection being used must be present during all tasks performed in exclusion or decontamination zones. Employees designated "FA-CPR" are currently certified by the American Red Cross, or equivalent, in first aid and CPR. At least one FA-CPR designated employee must be present during all tasks performed in exclusion or decontamination zones. The employees listed below are currently active in a medical surveillance program that meets state and federal regulatory requirements for

hazardous waste operations. Certain tasks (e.g., confined-space entry) and contaminants (e.g., lead) may require additional training and medical monitoring.

Pregnant employees are to be informed of and are to follow the procedures in CH2M HILL- SOP HSE-120, *Reproductive Health*, including obtaining a physician's statement of the employee's ability to perform hazardous activities before being assigned fieldwork.

Employee Name	Office	Responsibility	SC/FA-CPR
Reuben Greer	SPK	Field Team Leader/SC-HW	Level C SC-HW; FA-CPR
Huckleberry Palmer	SPK	Field Team Member	FA-CPR
Nathan Williams	PDX	Field Team Member	FA-CPR
Bob Martin	SPK	Project Manager	FA-CPR

3.2 Field Team Chain of Command and Communication Procedures

3.2.1 Client

Contact Name: Sam Pounds - Tidewater
Phone: (360) 693-1491
Facility Contact Name:
Phone:

3.2.2 CH2M HILL

Project Manager: Bob Martin/SPK
Health and Safety Manager: John Culley/SPK
Field Team Leader/SC-HW: Reuben Greer/SPK

The PM is responsible for providing adequate resources (budget and staff) for project-specific implementation of the HS&E management process. The PM has overall management responsibility for the tasks listed below. The PM may explicitly delegate specific tasks to other staff, as described in sections that follow, but retains ultimate responsibility for completion of the following in accordance with this SOP:

- Include standard terms and conditions, and contract-specific HS&E roles and responsibilities in contract and subcontract agreements (including flow-down requirements to lower-tier subcontractors).
- Select safe and competent subcontractors by:
  - Obtaining, reviewing and accepting or rejecting subcontractor pre-qualification questionnaires.
  - Ensuring that acceptable certificates of insurance, including CH2M HILL as named additional insured, are secured as a condition of subcontract award.
  - Including HS&E submittals checklist in subcontract agreements, and ensuring that appropriate site-specific safety procedures, training and medical monitoring records are reviewed and accepted prior to the start of subcontractor's field operations.

- Maintain copies of subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractor's license, training and medical monitoring records, and site-specific safety procedures in the project file accessible to site personnel.
- Provide oversight of subcontractor HS&E practices per the site-specific safety plan.
- Manage the site and interfacing with 3rd parties in a manner consistent with our contract and subcontract agreements and the applicable standard of reasonable care.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The CH2M HILL RHSM is responsible for:

- Review and accept or reject subcontractor pre-qualification questionnaires that fall outside the performance range delegated to the Contracts Administrator (KA).
- Review and accept or reject subcontractor training records and site-specific safety procedures prior to start of subcontractor's field operations.
- Support the oversight of subcontractor (and lower-tier subcontractors) HS&E practices and interfaces with on-site 3rd parties per the site-specific safety plan.

The SC is responsible for verifying that the project is conducted in a safe manner including the following specific obligations:

- Verify this HSP is current and amended when project activities or conditions change.
- Verify CH2M HILL site personnel and subcontractor personnel read the HSP and sign Attachment 1, Employee Sign-Off Form, prior to commencing field activities.
- Verify CH2M HILL site personnel and subcontractor personnel have completed any required specialty training (e.g., fall protection, confined space entry) and medical surveillance as identified in Section 2.
- Verify compliance with the requirements of this HSP and applicable subcontractor health and safety plan(s).
- Act as the project "Hazard Communication Coordinator" and perform the responsibilities outlined in Section 2.2.2.
- Act as the project "Emergency Response Coordinator" and perform the responsibilities outlined in Section 9.
- Post OSHA job-site poster; the poster is required at sites where project field offices, trailers, or equipment-storage boxes are established.
- Verify that safety meetings are conducted and documented in the project file initially and as needed throughout the course of the project (e.g., as tasks or hazards change).
- Verify that project H&S forms and permits, found in Attachment 4 and 5, are being used as outlined in Section 2.
- Perform oversight and/or assessments of subcontractor HS&E practices per the site-specific safety plan and verify that project activity self-assessment checklists, found in Attachment 4, are being used as outlined in Section 2.
- Verify that project files available to site personnel include copies of executed subcontracts and subcontractor certificates of insurance (including CH2M HILL as named additional insured), bond, contractors license, training and medical monitoring records, and site-specific safety procedures prior to start of subcontractor's field operations.

- Manage the site and interfacing with 3rd parties in a manner consistent with our contract/subcontract agreements and the applicable standard of reasonable care.
- Coordinate with the RHSM regarding CH2M HILL and subcontractor operational performance, and 3rd party interfaces.
- Ensure that the overall, job-specific, HS&E goals are fully and continuously implemented.

The training required for the SC is as follows:

- SC-Initial and SC-Construction or SC-HW
- OSHA 10-hour course for Construction
- First Aid and CPR
- Relevant Competent Person Courses (excavation, confined space, scaffold, fall protection, etc.).

The SC is responsible for contacting the Field Team Leader and Project Manager. In general, the Project Manager will contact the client. The RHSM should be contacted as appropriate.

3.2.3 CH2M HILL Subcontractors

(Reference CH2M HILL SOP HSE-215, *Contracts and Subcontracts)*

Subcontractor: Na
Subcontractor Contact Name:
Telephone:

The subcontractors listed above are required to submit their own Site-Specific HSP. Other plans, such as Lead or Asbestos Abatement Compliance plans may be required as well. Subcontractors are responsible for the health and safety procedures specific to their work, and are required to submit their plans to CH2M HILL for review before the start of field work.

Subcontractors are also required to prepare an Activity Hazard Analysis (AHA) before beginning each activity posing H&S hazards to their personnel using the AHA form provided in Attachment 5 as a guide. The AHA shall identify the principle steps of the activity, potential H&S hazards for each step and recommended control measures for each identified hazard. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

CH2M HILL should continuously endeavor to observe subcontractors' safety performance and adherence to their Accident Prevention Plan and AHAs. This endeavor should be reasonable, and include observing for hazards or unsafe practices that are both readily observable and occur in common work areas. CH2M HILL is not responsible for exhaustive observation for hazards and unsafe practices. Self-assessment checklists contained in Attachment 4 are to be used by CH2M HILL personnel to review subcontractor performance. CH2M HILL oversight does not relieve subcontractors of their responsibility for effective implementation and compliance with the established plan(s).

Health and safety related communications with CH2M HILL subcontractors should be conducted as follows:

- Brief subcontractors on the provisions of this plan, and require them to sign the Employee Signoff Form included in Attachment 1.
- Request subcontractor(s) to brief project team on the hazards and precautions related to their work.
- When apparent non-compliance/unsafe conditions or practices are observed, notify the subcontractor safety representative and require corrective action – the subcontractor is responsible for determining and implementing necessary controls and corrective actions.

- When repeat non-compliance/unsafe conditions are observed, notify the subcontractor safety representative and stop affected work until adequate corrective measures are implemented.
- When an apparent imminent danger exists, immediately remove all affected CH2M HILL employees and subcontractors, notify subcontractor safety representative, and stop affected work until adequate corrective measures are implemented. Notify the PM and RHSM as appropriate.
- Document all oral health and safety related communications in project field logbook, daily reports, or other records.

4.0 Personal Protective Equipment (PPE)

(Reference CH2M HILL- SOP HSE-117, *Personal Protective Equipment*)

4.1 Required PPE

- PPE must be worn by employees when actual or potential hazards exist and engineering controls or administrative practices cannot adequately control those hazards.
- A PPE assessment has been conducted by the RHSM based on project tasks (see PPE specifications below). Verification and certification of assigned PPE by task is completed by the RHSM or designee.
- Employees must be trained to properly wear and maintain the PPE.
- In work areas where actual or potential hazards are present at any time, PPE must be worn by employees working or walking through the area.
- Areas requiring PPE should be posted or employees must be informed of the requirements in an equivalent manner.
- PPE must be inspected prior to use and after any occurrence to identify any deterioration or damage.
- PPE must be maintained in a clean and reliable condition.
- Damaged PPE shall not be used and must either be repaired or discarded.
- PPE shall not be modified, tampered with, or repaired beyond routine maintenance.

The table below outlines PPE to be used according to task based on project-specific hazard assessment. If a task other than the tasks described in this table needs to be performed, contact the RHSM so this table can be updated.

PPE Specifications a

	Level		Head	Respirator [b]
• Field surveying		Work clothes; hard-sole boots; work glove.	Hardhat [c] Safety glasses Ear protection [d]	
(The activities above have no contact to contaminated media. If contact does occur, follow PPE requirements below)	N/A			None required
• Monitoring well redevelopment • Groundwater sampling • IDW (purge water) management	Modified D	**Coveralls:** Nomex coveralls **Boots:** Steel-toe, chemical-resistant boots OR steel-toe, leather work boots. **Gloves:** Inner surgical-style nitrile & outer chemical-resistant nitrile gloves.	Hardhat [c] Splash shield [c] Safety glasses Ear protection [d]	None required.

Reasons for Upgrading or Downgrading Level of Protection

Upgrade [e]	Downgrade
• Request from individual performing tasks. • Change in work tasks that will increase contact or potential contact with hazardous materials. • Occurrence or likely occurrence of gas or vapor emission. • Known or suspected presence of dermal hazards. • Instrument action levels (Section 5) exceeded.	• New information indicating that situation is less hazardous than originally thought. • Change in site conditions that decreases the hazard. • Change in work task that will reduce contact with hazardous materials.

[a] Modifications are as indicated. CH2M HILL will provide PPE only to CH2M HILL employees.

[b] No facial hair that would interfere with respirator fit is permitted.

[c] Hardhat and splash-shield areas are to be determined by the SC-HW.

[d] Ear protection should be worn when conversations cannot be held at distances of 3 feet or less without shouting.

[e] Performing a task that requires an upgrade to a higher level of protection (e.g., Level D to Level C) is permitted only when the PPE requirements have been approved by the HSM, and an SC-HW qualified at that level is present.

PPE Certification

I certify that the PPE requirements listed in the table above for the associated tasks are based upon the project-specific hazard assessment I performed.
Michael Goldman CIh, CSP, CHMM CPEA

Name	06/14/10 Date of Certification	06/14/10 Date(s) of Project Hazard Assessment

4.2 Respiratory Protection

(Reference CH2M HILL SOP HSE-121, *Respiratory Protection*)

- Respirator users must have completed appropriate respirator training within the past 12 months. Level C training is required for air-purifying respirators (APR) use and Level B training is required for supplied-air respirators (SAR) and self-contained breathing apparatus (SCBA) use. Specific training is required for the use of powered air-purifying respirators (PAPR).
- Respirator users must complete the respirator medical monitoring protocol and been approved for the specific type of respirator to be used.

- Tight-fitting facepiece respirator (negative or positive pressure) users must have passed an appropriate fit test within past 12 months.
- Respirator use shall be limited to those activities identified in this plan. If site conditions change that alters the effectiveness of the specified respiratory protection, the RHSM shall be notified to amend the written plan.
- Tight-fitting facepiece respirator users shall be clean-shaven and shall perform a user seal check before each use.
- Canisters/cartridges shall be replaced according to the change-out schedule specified in this plan. Respirator users shall notify the SC or RHSM of any detection of vapor or gas breakthrough. The SC shall report any breakthrough events to the RHSM for schedule upgrade.
- Respirators in regular use shall be inspected before each use and during cleaning
- Respirators in regular use shall be cleaned and disinfected as often as necessary to ensure they are maintained in a clean and sanitary condition.
- Respirators shall be properly stored to protect against contamination and deformation.
- Field repair of respirators shall be limited to routine maintenance. Defective respirators shall be removed from service.
- When breathing air is supplied by cylinder or compressor, the SC or RHSM shall verify the air meets Grade D air specifications.
- The SC or designee shall complete the H&S Self-Assessment Checklist – Respiratory Protection included in Attachment 4 of this plan to verify compliance with CH2M HILL's respiratory protection program.

Respirator Change-Out Schedule

Contaminant	Change-Out Schedule
Benzene	End-of-service life or end of shift (whichever occurs first)

5.0 Air Monitoring/Sampling

(Reference CH2M HILL SOP HSE-207, Exposure Monitoring for Airborne Chemical Hazards)

5.1 Air Monitoring Specifications

Instrument	Tasks	Action Levels[a]	Action to be Taken when Action Level reached	Frequency [b]	Calibration
PID: MiniRAE PID with 10.6 eV lamp or equivalent	• Monitoring well redevelopment • Groundwater sampling • IDW (purge water) management	<1 ppm ≥1 ppm	→ Level D → Stop work; Contact HSM	Initially and continuously during task; record every 30-60 minutes	Daily

[a] Action levels apply to sustained breathing-zone measurements above background.

[b] The exact frequency of monitoring depends on field conditions and is to be determined by the SC; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results shall be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "Breathing Zone/MW-3", "at surface/SB-2", etc.).

[c] If the measured percent of O_2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O_2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More-stringent percent LEL and O_2 action levels are required for confined-space entry (refer to Section 2).

[d] Noise monitoring and audiometric testing also required.

5.2 Calibration Specifications

(Refer to the respective manufacturer's instructions for proper instrument-maintenance procedures)

Instrument	Gas	Span	Reading	Method
PID: MiniRAE, 10.6 eV bulb	100 ppm isobutylene	CF = 100	100 ppm	1.5 lpm reg T-tubing

5.3 Air Sampling

Sampling, in addition to real-time monitoring, may be required by other OSHA regulations where there may be exposure to certain contaminants. Air sampling typically is required when site contaminants include lead, cadmium, arsenic, asbestos, and certain volatile organic compounds. Contact the HSM immediately if these contaminants are encountered.

Method Description

Not Required

Personnel and Areas

Results must be sent immediately to the RHSM. Regulations may require reporting to monitored personnel. Results reported to:

HSM: John Culley

6.0 Decontamination

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations*)

The SC must establish and monitor the decontamination procedures and their effectiveness. Decontamination procedures found to be ineffective will be modified by the SC. The SC must ensure that procedures are established for disposing of materials generated on the site.

6.1 Decontamination Specifications

Personnel

- Boot wash/rinse
- Glove wash/rinse
- Outer-glove removal
- Body-suit removal
- Inner-glove removal
- Respirator removal
- Hand wash/rinse
- Face wash/rinse
- Shower ASAP
- Dispose of PPE in municipal trash, or contain for disposal
- Dispose of personnel rinse water to facility or sanitary sewer, or contain for offsite disposal

Sample Equipment

- Wash/rinse equipment
- Solvent-rinse equipment
- Contain solvent waste for offsite disposal

Heavy Equipment

- Power wash
- Steam clean
- Dispose of equipment rinse water to facility or sanitary sewer, or contain for offsite disposal

6.2 Diagram of Personnel-Decontamination Line

No eating, drinking, or smoking is permitted in contaminated areas and in exclusion or decontamination zones. The SC should establish areas for eating, drinking, and smoking. Contact lenses are not permitted in exclusion or decontamination zones.

Figure 6-1 illustrates a conceptual establishment of work zones, including the decontamination line. Work zones are to be modified by the SC to accommodate task-specific requirements.

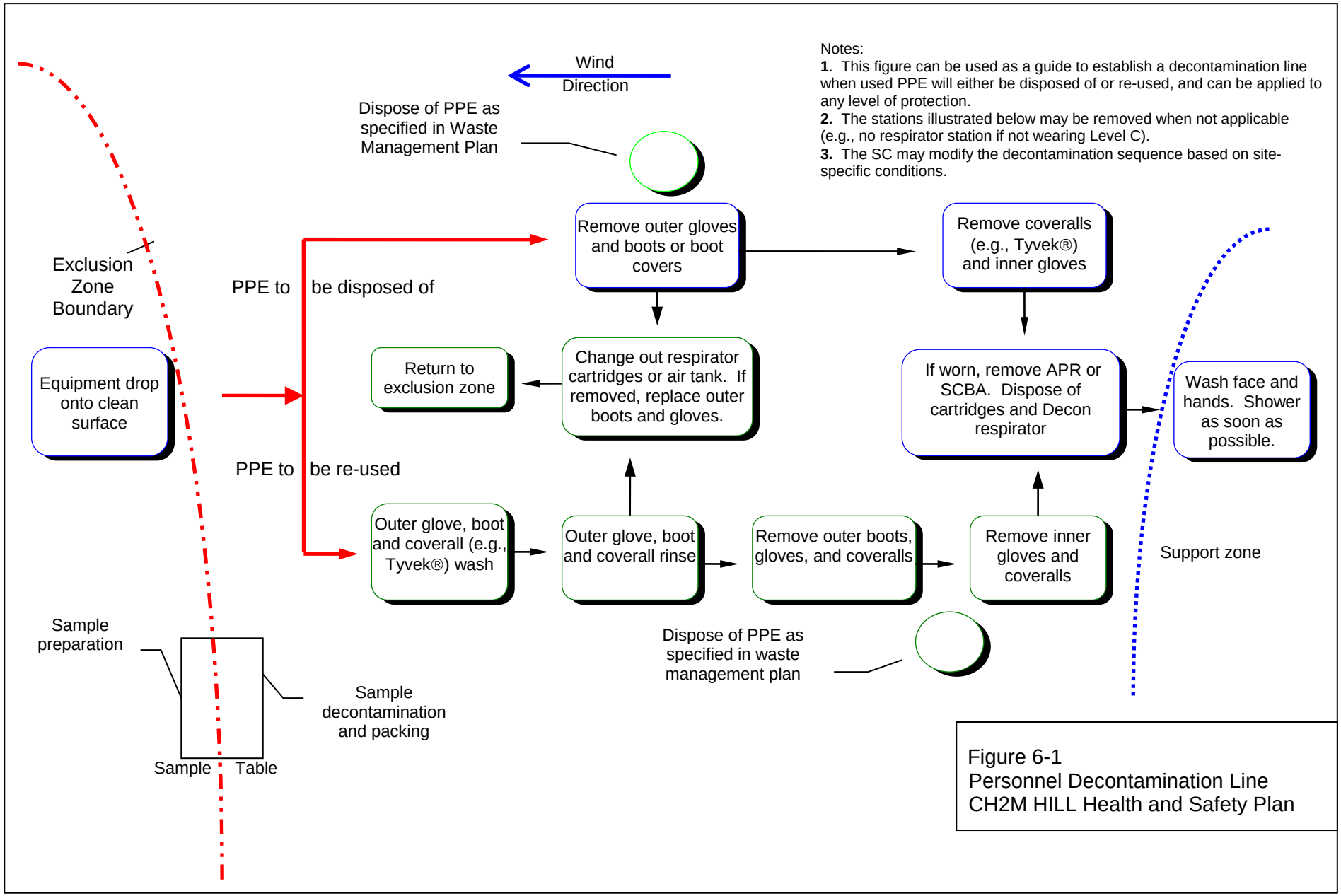


Figure 6-1
Personnel Decontamination Line
CH2M HILL Health and Safety Plan

7.0 Spill Containment Procedures

Sorbent material will be maintained in the support zone. Incidental spills will be contained with sorbent and disposed of properly.

8.0 Site-Control Plan

8.1 Site-Control Procedures

(Reference CH2M HILL SOP HSE-218, *Hazardous Waste Operations)*

- The SC will conduct a site safety briefing (see below) before starting field activities or as tasks and site conditions change.
- Topics for briefing on site safety: general discussion of Health and Safety Plan, site-specific hazards, locations of work zones, PPE requirements, equipment, special procedures, emergencies.
- The SC records attendance at safety briefings in a logbook and documents the topics discussed.
- Post the OSHA job-site poster in a central and conspicuous location in accordance with CH2M HILL- Core Standard, *OSHA Postings*.
- Establish support, decontamination, and exclusion zones. Delineate with flags or cones as appropriate. Support zone should be upwind of the site. Use access control at entry and exit from each work zone.
- Establish onsite communication consisting of the following:
  - Line-of-sight and hand signals
  - Air horn
  - Two-way radio or cellular telephone if available
- Establish offsite communication.
- Establish and maintain the "buddy system."
- Initial air monitoring is conducted by the SC in appropriate level of protection.
- The SC is to conduct periodic inspections of work practices to determine the effectiveness of this plan – refer to Sections 2 and 3. Deficiencies are to be noted, reported to the HSM, and corrected.

8.2 Hazwoper Compliance Plan

(Reference CH2M HILL SOP HSE-220, Written Plans and HSE-218 Hazardous Waste Operations)

Certain parts of the site work are covered by state or federal Hazwoper standards and therefore require training and medical monitoring. Anticipated Hazwoper tasks (Section 1.1.1) might occur consecutively or concurrently with respect to non-Hazwoper tasks. This section outlines procedures to be followed when approved activities specified in Section 1.1.2 do not require 24- or 40-hour training. Non-Hazwoper-trained personnel also must be trained in accordance with all other state and federal OSHA requirements.

- In many cases, air sampling, in addition to real-time monitoring, must confirm that there is no exposure to gases or vapors before non-Hazwoper-trained personnel are allowed on the site, or while non-Hazwoper-trained staff is working in proximity to Hazwoper activities. Other data (e.g., soil) also must document that there is no potential for exposure. The RHSM must approve the interpretation of these data. Refer to Sections 2.0 and 5.0 for contaminant data and air sampling requirements, respectively.

- When non-Hazwoper-trained personnel are at risk of exposure, the SC must post the exclusion zone and inform non-Hazwoper-trained personnel of the:
  - nature of the existing contamination and its locations
  - limitations of their access
  - emergency action plan for the site
- Periodic air monitoring with direct-reading instruments conducted during regulated tasks also should be used to ensure that non-Hazwoper-trained personnel (e.g., in an adjacent area) are not exposed to airborne contaminants.
- When exposure is possible, non-Hazwoper-trained personnel must be removed from the site until it can be demonstrated that there is no longer a potential for exposure to health and safety hazards.
- Remediation treatment system start-ups: Once a treatment system begins to pump and treat contaminated media, the site is, for the purposes of applying the Hazwoper standard, considered a treatment, storage, and disposal facility (TSDF). Therefore, once the system begins operation, only Hazwoper-trained personnel (minimum of 24 hour of training) will be permitted to enter the site. All non-Hazwoper-trained personnel must not enter the TSDF area of the site.

9.0 Emergency Response Plan

(Reference CH2M HILL SOP HSE-106, *Emergency Planning*)

9.1 Pre-Emergency Planning

- The Emergency Response Coordinator (ERC) performs the applicable pre-emergency planning tasks before starting field activities and coordinates emergency response with CH2M HILL onsite parties, the facility, and local emergency-service providers as appropriate.
- Review the facility emergency and contingency plans where applicable.
- Determine what onsite communication equipment is available (e.g., two-way radio, air horn).
- Determine what offsite communication equipment is needed (e.g., nearest telephone, cell phone).
- Confirm and post emergency telephone numbers, evacuation routes, assembly areas, and route to hospital; communicate the information to onsite personnel.
- Field Trailers: Post "Exit" signs above exit doors, and post "Fire Extinguisher" signs above locations of extinguishers. Keep areas near exits and extinguishers clear.
- Review changed site conditions, onsite operations, and personnel availability in relation to emergency response procedures.
- Where appropriate and acceptable to the client, inform emergency room and ambulance and emergency response teams of anticipated types of site emergencies.
- Designate one vehicle as the emergency vehicle; place hospital directions and map inside; keep keys in ignition during field activities.
- Inventory and check site emergency equipment, supplies, and potable water.
- Communicate emergency procedures for personnel injury, exposures, fires, explosions, and releases.
- Rehearse the emergency response plan before site activities begin, including driving route to hospital. Drills should take place periodically but no less than once a year.
- Brief new workers on the emergency response plan.
- The ERC will evaluate emergency response actions and initiate appropriate follow-up actions.

9.2 Emergency Equipment and Supplies

The ERC should mark the locations of emergency equipment on the site map and post the map.

Emergency Equipment and Supplies	Location
20 (or two 10) class A,B,C fire extinguisher	Support Zone/Field Vehicle
First aid kit	Support Zone/Field Vehicle
Eye Wash	Support Zone/Field Vehicle
Emergency Shower	Support Zone/Field Vehicle
Potable water	Support Zone/Field Vehicle
Bloodborne-pathogen kit	Support Zone/Field Vehicle
Additional equipment (specify):	TBD

9.3 Incident Response

In fires, explosions, or chemical releases, actions to be taken include the following:

- Notify appropriate response personnel.
- Shut down CH2M HILL operations and evacuate the immediate work area.
- Account for personnel at the designated assembly area(s).
- Assess the need for site evacuation, and evacuate the site as warranted.
- Implement HSE-111, Incident Notification, Reporting and Investigation.
- Notify and submit reports to clients as required in contract.

Small fires or spills posing minimal safety or health hazards may be controlled with onsite spill kits or fire extinguishers without evacuating the site. When in doubt evacuate. Follow the incident reporting procedures in Section 9.7.

9.4 Emergency Medical Treatment

Emergency medical treatment is needed when there is a life-threatening injury (such as severe bleeding, loss of consciousness, breathing/heart has stopped). When in doubt if an injury is life-threatening or not, treat it as needing emergency medical treatment.

- Notify 911 or other appropriate emergency response authorities as listed in Emergency Contacts at the front of this HSP.
- The ERC will assume charge during a medical emergency until the ambulance arrives or until the injured person is admitted to the emergency room.
- Prevent further injury, perform decontamination (if applicable) where feasible; lifesaving and first aid or medical treatment takes priority.
- Initiate first aid and CPR where feasible.
- Notify supervisor and if the injured person is a CH2M HILL employee, the supervisor will call the occupational nurse at 1-866-893-2514 and make other notifications as required by HSE SOP-111, *Incident Notification, Reporting and Investigation*.
- Make certain that the injured person is accompanied to the emergency room.
- Follow the Serious Incident Reporting process in HSE SOP-111, Incident Notification, Reporting and Investigation, and complete incident report forms in Attachment 5.
- Notify and submit reports to client as required in contract.

9.5 Evacuation

- Evacuation routes, assembly areas, and severe weather shelters (and alternative routes and assembly areas) are to be specified on the site map.
- Evacuation route(s) and assembly area(s) will be designated by the ERC or designee before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.

- The ERC and a "buddy" will remain on the site after the site has been evacuated (if safe) to assist local responders and advise them of the nature and location of the incident.
- The ERC will account for all personnel in the onsite assembly area.
- A designated person will account for personnel at alternate assembly area(s).
- The ERC will follow the incident reporting procedures in Section 9.7.

9.6 Evacuation Signals

Signal	Meaning
Grasping throat with hand	Emergency-help me.
Thumbs up	OK; understood.
Grasping buddy's wrist	Leave area now.
Continuous sounding of horn	Emergency; leave site now.

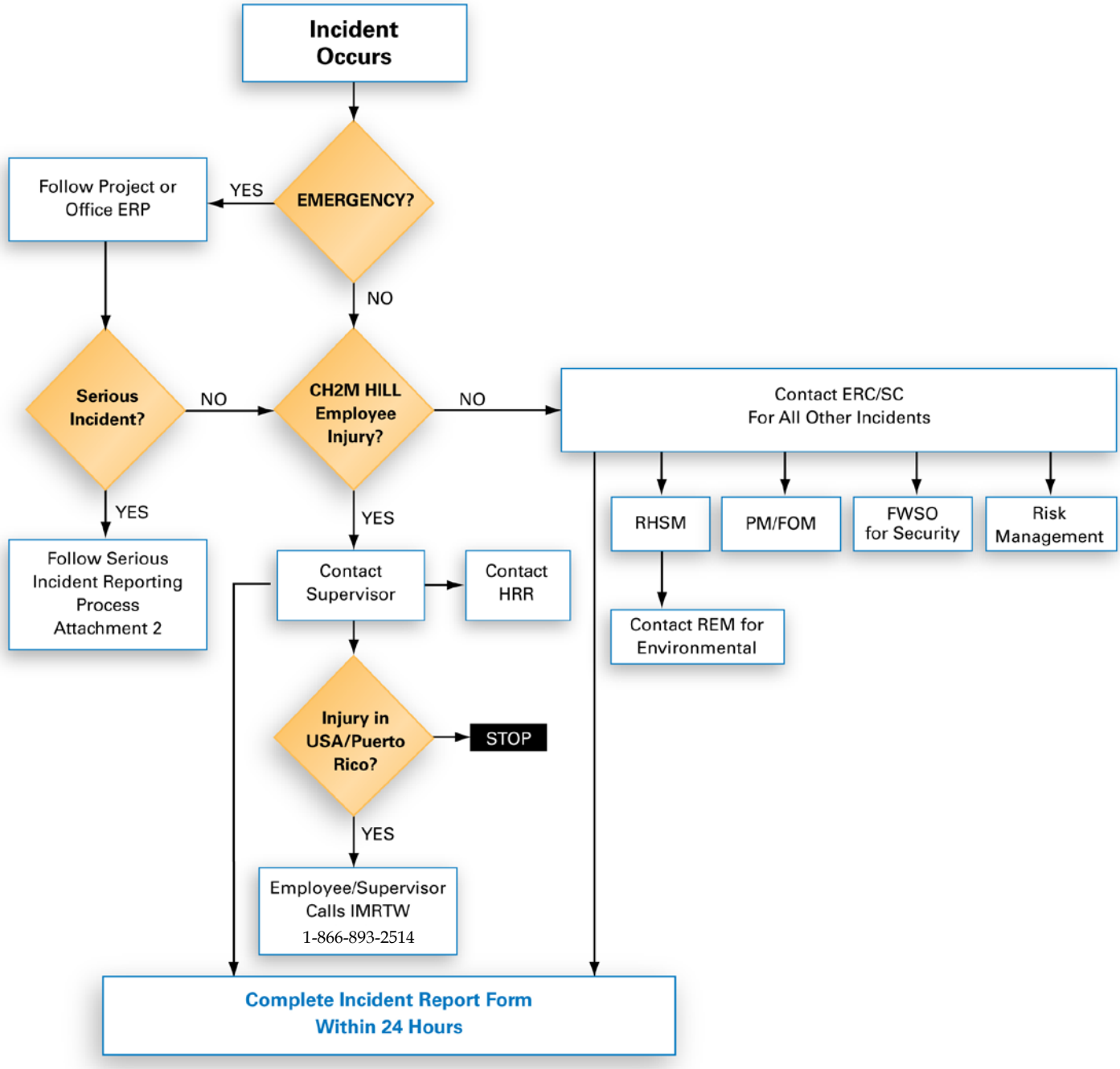
9.7 Incident Notification and Reporting

(Reference CH2M HILL SOP HSE-111, *Incident Notification, Reporting and Investigation*)

- If you are injured at work, notify your supervisor immediately and contact the Injury Management/Return-to-Work toll free number (for US and Puerto Rico) 1-866-893-2514. All supervisors must contact their Human Resources Representative and complete the employee injury/illness in the Incident Report Form (IRF) in the HITS database within 24 hours of the incident.
- Immediately notify the Project Manager (PM), Emergency Response Coordinator (ERC), and/or Responsible Health and Safety Manager (RHSM) for any project incident (fire, spill/release, injury/illness, near miss, property damage, or security-related).
- Report any **serious incidents** (life-threatening injury/illness, death, kidnap/missing person, terrorism, property damage greater than $500K, significant environmental release) **immediately** to your ERC, PM, or RHSM. The Serious Incident Reporting number is 720-286-4911.
- For serious incidents, the Corporate Legal Department will determine who completes the IRF.
- For CH2M HILL subcontractor incidents, immediately notify the ERC and HSM to complete and submit an IRF.
- The RHSM will inform the Responsible Environmental Manager (REM) of any environmental incidents.
- Evaluation and follow-up of the IRF will be completed by the type of incident by the RHSM, REM, or FWSO. The Business Group (BG) HSE Lead will review all BG incidents and modify as required.
- Incident Investigations must be initiated and completed as soon as possible but no later than 72 hours after the incident.
- See the following flowcharts for Immediate Incident Reporting and Serious Incident Reporting.

CH2MHILL

Attachment 1
CH2M HILL Immediate Incident Notification



ERC = Emergency Response Coordinator (designated in Emergency Response Plan)
ERP = Emergency Response Plan
FOM = Facility Office Manager
FWSO = Firm Wide Security Operations
HRR = Human Resources Representative
IMRTW = Injury Management/Return-to-Work
PM = Project Manager
REM = Responsible Environmental Manager
RHSM = Responsible Health & Safety Manager
SC = Safety Coordinator

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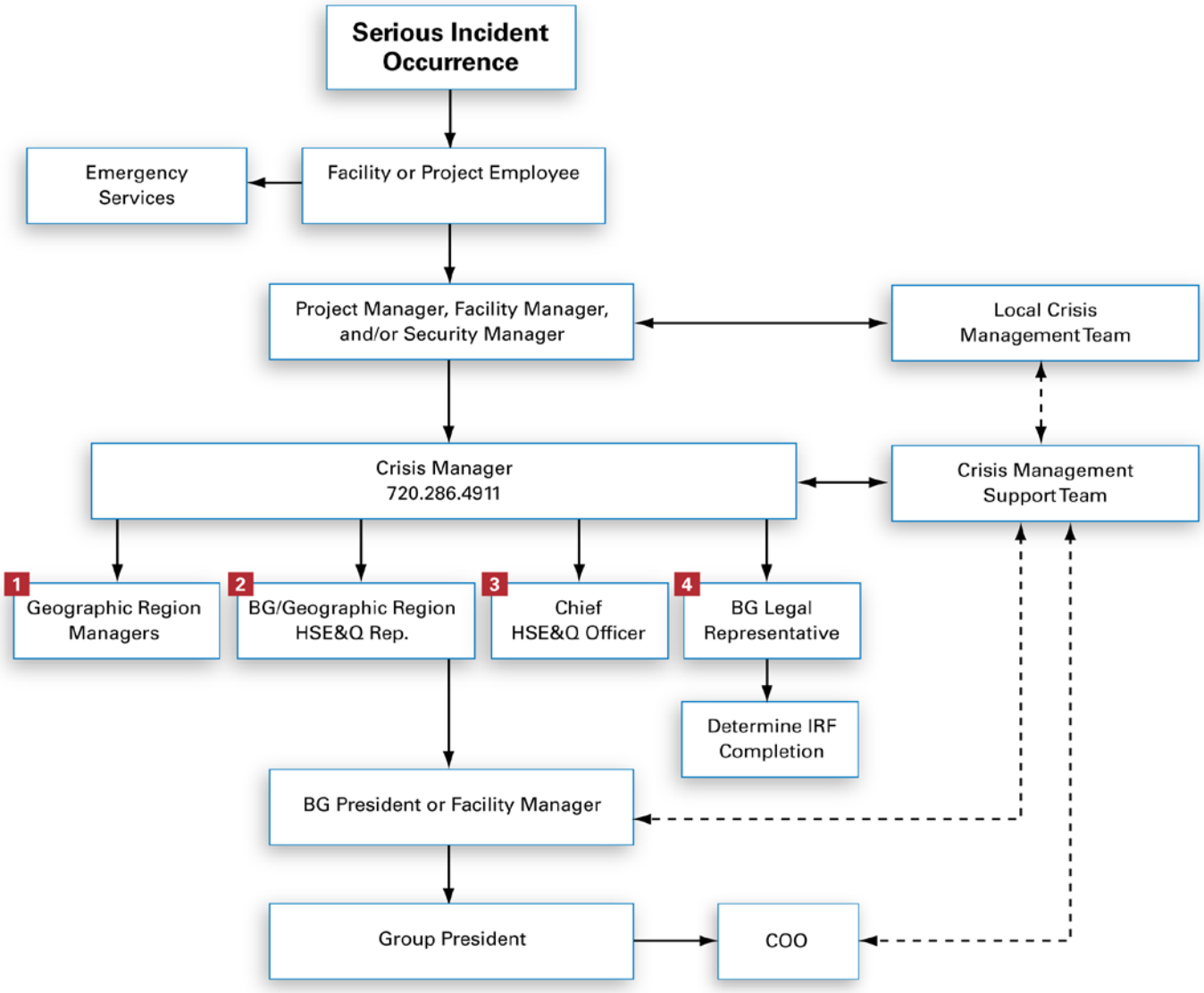
CH2MHILL

Attachment 2
CH2M HILL Serious Incident Notification



LEGEND:

Direct line of communication

Indirect line of communication

DEFINITIONS:

Local Crisis Management Team: Team comprised of key facility, project and/or business group personnel. Team is assembled as necessary and as appropriate to effectively manage and respond to a crisis situation (serious incident) at/on scene.

Crisis Management Support Team: Team comprised of key corporate personnel. Team is assembled as necessary and as appropriate to effectively support, direct, and /or supplement a Local Crisis Management Team.

Crisis Manager: Corporate based Crisis Manager, contactable by pager 24/7.

10.0 Behavior Based Loss Prevention System

(Reference CH2M HILL SOP HSE-103, *Behavior Based Loss Prevention System*)

A Behavior Based Loss Prevention System (BBLPS) is a system to prevent or reduce losses using behavior-based tools and proven management techniques to focus on behaviors or acts that could lead to losses.

The four basic Loss Prevention tools that will be used by CH2M HILL projects to implement the BBLPS include:

- Activity Hazard Analysis (AHA)
- Pre-Task Safety Plans (PTSP)
- Safe Behavior Observations (SBO)
- Loss and Near Loss Investigations (NLI)

The SC or designated CH2M HILL representative onsite is responsible for implementing the BBLPS on the project site. The Project Manager remains accountable for its implementation. The SC or designee shall only oversee the subcontractor's implementation of their AHAs and PTSPs processes on the project.

10.1 Activity Hazard Analysis

An Activity Hazard Analysis (AHA) defines the activity being performed, the hazards posed and control measures required to perform the work safely. Workers are briefed on the AHA before doing the work and their input is solicited prior, during and after the performance of work to further identify the hazards posed and control measures required.

Activity Hazard Analysis will be prepared before beginning each project activity posing H&S hazards to project personnel using the AHA form provided in Attachment 5. The AHA shall identify the work tasks required to perform each activity, along with potential H&S hazards and recommended control measures for each work task. In addition, a listing of the equipment to be used to perform the activity, inspection requirements and training requirements for the safe operation of the equipment listed must be identified.

An AHA shall be prepared for all field activities performed by CH2M HILL and subcontractor activities during the course of the project. Hazard Controls (found in Sections 2.0 and its subsections of the HSP), the Hazard Analysis Table (Table 1), and applicable CH2M HILL CSs and SOPs should be used as a basis for preparing AHAs.

CH2M HILL subcontractors are required to provide AHAs specific to their scope of work on the project for acceptance by CH2M HILL. Each subcontractor shall submit AHAs for their field activities, as defined in their work plan/scope of work, along with their project-specific safety plan/accident prevention plan. Additions or changes in CH2M HILL or subcontractor field activities, equipment, tools or material to perform work or additional/different hazard encountered that require additional/different hazard control measures requires either a new AHA to be prepared or an existing AHA to be revised.

10.2 Pre-Task Safety Plans

Daily safety meetings are held with all project personnel in attendance to review the hazards posed and required H&S procedures/AHAs, which apply for each day's project activities. The PTSPs serve the

same purpose as these general assembly safety meetings, but the PTSPs are held between the crew supervisor and their work crews to focus on those hazards posed to individual work crews. At the start of each day's activities, the crew supervisor completes the PTSP, provided in Attachment 5, with input from the work crew, during their daily safety meeting. The day's tasks, personnel, tools and equipment that will be used to perform these tasks are listed, along with the hazards posed and required H&S procedures, as identified in the AHA. The use of PTSPs, better promotes worker participation in the hazard recognition and control process, while reinforcing the task-specific hazard and required H&S procedures with the crew each day. The use of PTSPs is a common safety practice in the construction industry.

10.3 Safe Behavior Observations

Safe Behavior Observations (SBOs) shall be conducted by SC or designee for specific work tasks or operations comparing the actual work process against established safe work procedures identified in the project-specific HSP and AHAs. SBOs are a tool to be used by supervisors to provide positive reinforcement for work practices performed correctly, while also identifying and eliminating deviations from safe work procedures that could result in a loss. The SC or designee shall perform at least one SBO each week for tasks/operations addressed in the project-specific HSP or AHA. The SC or designee shall complete the SBO form in **Attachment 5** for the task/operation being observed and submit the SBO form weekly to Margaret Dombrowski/MKE.

10.4 Loss/Near Loss Investigations

Loss/Near Loss Investigations shall be performed for CH2M HILL and subcontractor incidents involving:

- Person injuries/illnesses and near miss injuries,
- Equipment/property damage,
- Spills, leaks, regulatory violations,
- Motor vehicle accidents.

The cause of loss and near loss incidents are similar, so by identifying and correcting the causes of near loss causes, future loss incidents may be prevented. The following is the Loss/Near Loss Investigation Process:

- Gather all relevant facts, focusing on fact-finding, not fault-finding, while answering the who, what, when, where and how questions.
- Draw conclusions, pitting facts together into a probable scenario.
- Determine incident root cause(s), which are basic causes on why an unsafe act/condition existed.
- Develop and implement solutions, matching all identified root causes with solutions.
- Communicate incident as a Lesson Learned to all project personnel.
- Filed follow-up on implemented corrective active action to confirm solution is appropriate.

The SC or designee shall perform an incident investigation, as soon as practical after incident occurrence during the day of the incident, for all Loss and Near Loss Incidents that occur on the project. Loss and Near Loss incident investigations shall be performed using the following incident investigation forms provided in **Attachment 5.**

- Incident Report Form (IRF)
- Root Cause Analysis Form

All Loss and Near Loss incident involving personal injury, property damage in excess of $1,000 or near loss incidents that could have resulted in serious consequences shall be investigated by completing the incident investigation forms and submitting them to the PM and RHSM within 24 hours of incident occurrence. A preliminary Incident Investigation and Root Cause Analysis shall be submitted to the Project Manager and RHSM within 24 hours of incident occurs. The final Incident Investigation and Root Cause Analysis shall be submitted after completing a comprehensive investigation of the incident.

11.0 Approval

This site-specific HSP has been written for use by CH2M HILL only. CH2M HILL claims no responsibility for its use by others unless that use has been specified and defined in project or contract documents. The plan is written for the specific site conditions, purposes, dates, and personnel specified and must be amended if those conditions change.

Original Plan
Written By: **Date:**

Approved By: **Date:**

Revisions
Revisions Made By: **Date:**

Revisions to Plan: Updated

Revisions Approved By: **Date:**

12.0 Attachments

Attachment 1: **Employee Signoff Form – Health and Safety Plan**
Attachment 2: **Chemical Inventory/Register Form**
Attachment 3: **Chemical-Specific Training Form**
Attachment 4: **Project Activity Self-Assessment Checklists/Permits**
Attachment 5: **Behavior Based Loss Prevention Forms**
Attachment 6: **Material Safety Data Sheets**
Attachment 7: **Working Alone Standard**
Attachment 8: **Tick Fact Sheet**
Attachment 9: **Notice of Safety Violation Form**
Attachment 10: **Stop Work Order Form**

CH2M HILL Health and Safety Plan

Attachment 1

Health and Safety Plan Employee Sign-off Form

EMPLOYEE SIGNOFF FORM

Health and Safety Plan

The CH2M HILL project employees and subcontractors listed below have been provided with a copy of this HSP, have read and understood it, and agree to abide by its provisions.

Project Name: NWTC Pasco Terminal **Project Number:** 390624.T1.20.02

EMPLOYEE NAME (Please print)	**EMPLOYEE SIGNATURE**	**COMPANY**	**DATE**

CH2M HILL Health and Safety Plan

Attachment 2

Chemical Inventory/Register Form

CH2MHILL

CHEMICAL INVENTORY/REGISTER FORM

Refer to SOP HSE-107, Attachment 1, for instructions on completing this form.

Location: _____

HCC: _____

☐ Office ☐ Warehouse ☐ Laboratory ☐ Project: _____

Project No.: _____

Regulated Product	Location	Container labeled (✓if yes)	MSDS available (✓if yes)

MSDS for the listed products will be maintained at: _____

CH2M HILL Health and Safety Plan

Attachment 3

Chemical-Specific Training Form

CH2MHILL

CHEMICAL-SPECIFIC TRAINING FORM

Refer to SOP HSE-107 Attachment 1 for instructions on completing this form.

Location:	Project # :
HCC:	Trainer:

TRAINING PARTICIPANTS:

NAME	SIGNATURE	NAME	SIGNATURE

REGULATED PRODUCTS/TASKS COVERED BY THIS TRAINING:

The HCC shall use the product MSDS to provide the following information concerning each of the products listed above.

☐ Physical and health hazards

☐ Control measures that can be used to provide protection (including appropriate work practices, emergency procedures, and personal protective equipment to be used)

☐ Methods and observations used to detect the presence or release of the regulated product in the workplace (including periodic monitoring, continuous monitoring devices, visual appearance or odor of regulated product when being released, etc.)

Training participants shall have the opportunity to ask questions concerning these products and, upon completion of this training, will understand the product hazards and appropriate control measures available for their protection.

Copies of MSDSs, chemical inventories, and CH2M HILL's written hazard communication program shall be made available for employee review in the facility/project hazard communication file.

CH2M HILL Health and Safety Plan

Attachment 4

Project Activity Self-Assessment Checklists/Permits/Forms

CH2M HILL Health and Safety Plan

Attachment 5

Behavior Based Loss Prevention System Forms

Activity Hazard Analysis Template

Pre-Task Safety Plans

Safe Behavior Observation

Incident Report and Investigation

(use electronic form when possible)

HITS

Activity:	**Date:**
	Project:
Description of the work:	**Site Supervisor:**
	Site Safety Officer:
	Review for latest use: **Before the job is performed.**

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)

	PRINT NAME	**SIGNATURE**	
Supervisor Name:	_____	_____	**Date/Time:**_____
Safety Officer Name:	_____	_____	**Date/Time:**_____
Employee Name(s):	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____
	_____	_____	**Date/Time:**_____

CH2MHILL

Pre-Task Safety Plan (PTSP)

Project: _____ Location: _____Date:_____

Supervisor: _____ Job Activity:_____

_____

Task Personnel:

_____

_____

_____

_____

List Tasks:

_____

_____

_____

_____

Tools/Equipment Required for Tasks (ladders, scaffolds, fall protection, cranes/rigging, heavy equipment, power tools):

_____

_____

_____

Potential H&S Hazards, including chemical, physical, safety, biological and environmental (check all that apply):

__ Chemical burns/contact	__ Trench, excavations, cave-ins	__ Ergonomics
__ Pressurized lines/equipment	__ Overexertion	__ Chemical splash
__ Thermal burns	__ Pinch points	__ Poisonous plants/insects
__ Electrical	__ Cuts/abrasions	__ Eye hazards/flying projectile
__ Weather conditions	__ Spills	__ Inhalation hazard
__ Heights/fall > 6 feet	__ Overhead Electrical hazards	__ Heat/cold stress
__ Noise	__ Elevated loads	__ Water/drowning hazard
__ Explosion/fire	__ Slips, trip and falls	__ Heavy equipment
__ Radiation	__ Manual lifting	__ Aerial lifts/platforms
__ Confined space entry	__ Welding/cutting	__ Demolition

Other Potential Hazards (Describe):

_____

_____

_____

CH2MHILL

Hazard Control Measures (Check All That Apply):			
PPE __ Thermal/lined __ Eye __ Dermal/hand __ Hearing __ Respiratory __ Reflective vests __ Flotation device	Protective Systems __ Sloping __ Shoring __ Trench box __ Barricades __ Competent person __ Locate buried utilities __ Daily inspections	Fire Protection __ Fire extinguishers __ Fire watch __ Non-spark tools __ Grounding/bonding __ Intrinsically safe equipment	Electrical __ Lockout/tagout __ Grounded __ Panels covered __ GFCI/extension cords __ Power tools/cord inspected
Fall Protection __ Harness/lanyards __ Adequate anchorage __ Guardrail system __ Covered opening __ Fixed barricades __ Warning system	Air Monitoring __ PID/FID __ Detector tubes __ Radiation __ Personnel sampling __ LEL/O2 __ Other	Proper Equipment __ Aerial lift/ladders/scaffolds __ Forklift/heavy equipment __ Backup alarms __ Hand/power tools __ Crane with current inspection __ Proper rigging __ Operator qualified	Welding & Cutting __ Cylinders secured/capped __ Cylinders separated/upright __ Flash-back arrestors __ No cylinders in CSE __ Flame retardant clothing __ Appropriate goggles
Confined Space Entry __ Isolation __ Air monitoring __ Trained personnel __ Permit completed __ Rescue	Medical/ER __ First-aid kit __ Eye wash __ FA-CPR trained personnel __ Route to hospital	Heat/Cold Stress __ Work/rest regime __ Rest area __ Liquids available __ Monitoring __ Training	Vehicle/Traffic __ Traffic control __ Barricades __ Flags __ Signs
Permits __ Hot work __ Confined space __ Lockout/tagout __ Excavation __ Demolition __ Energized work	Demolition __ Pre-demolition survey __ Structure condition __ Isolate area/utilities __ Competent person __ Hazmat present	Inspections: __ Ladders/aerial lifts __ Lanyards/harness __ Scaffolds __ Heavy equipment __ Cranes and rigging	Training: __ Hazwaste __ Construction __ Competent person __ Task-specific (THA) __ Hazcom
Field Notes:_____ _____ _____			

Name (Print): _____

Signature:_____ Date:_____

Safe Behavior Observation Form		
Project Name:	Observer:	Date:
Program / Client:	Project Mgr. & No.:	
Position/Title of worker observed:	Background Information/ comments:	
Task/Observation Observed:		

- ❖ Identify and reinforce safe work practices/behaviors
- ❖ Identify and improve on at-risk practices/acts
- ❖ Identify and improve on practices, conditions, controls, and compliance that eliminate or reduce hazards
- ❖ Proactive PM support facilitates eliminating/reducing hazards (do you have what you need?)
- ❖ Positive, corrective, cooperative, collaborative feedback/recommendations

Actions & Behaviors	Safe	At-Risk	Observations/Comments
Current & accurate Pre-Task Planning/Briefing (Project safety plan, STAC, AHA, PTSP, tailgate briefing, etc., as needed)			**Positive Observations/Safe Work Practices:**
Properly trained/qualified/experienced			
Tools/equipment available and adequate			
Proper use of tools			**Questionable Activity/Unsafe Condition Observed:**
Barricades/work zone control			
Housekeeping			
Communication			
Work Approach/Habits			
Attitude			
Focus/attentiveness			**Observer's Corrective Actions/Comments:**
Pace			
Uncomfortable/unsafe position			
Inconvenient/unsafe location			
Position/Line of fire			
Apparel (hair, loose clothing, jewelry)			
Repetitive motion			**Observed Worker's Corrective Actions/Comments:**
Other…			

CH2M HILL Health and Safety Plan

Attachment 6

Material Safety Data Sheets

CH2M HILL Health and Safety Plan

Attachment 7

Working Alone Standard

CALL – IN CONTACT FORM

Date of site work:_____ Expected start time:_____

Name of CH2M HILL employee in the field:_____

Name of CH2M HILL employee responsible to receive contact:

Client Emergency Contact (if any):

CH2M HILL employee's contact numbers:

Radio #_____

Cell Phone #_____

Address and Location of work:_____

Directions/Map:

Planned Activity:_____

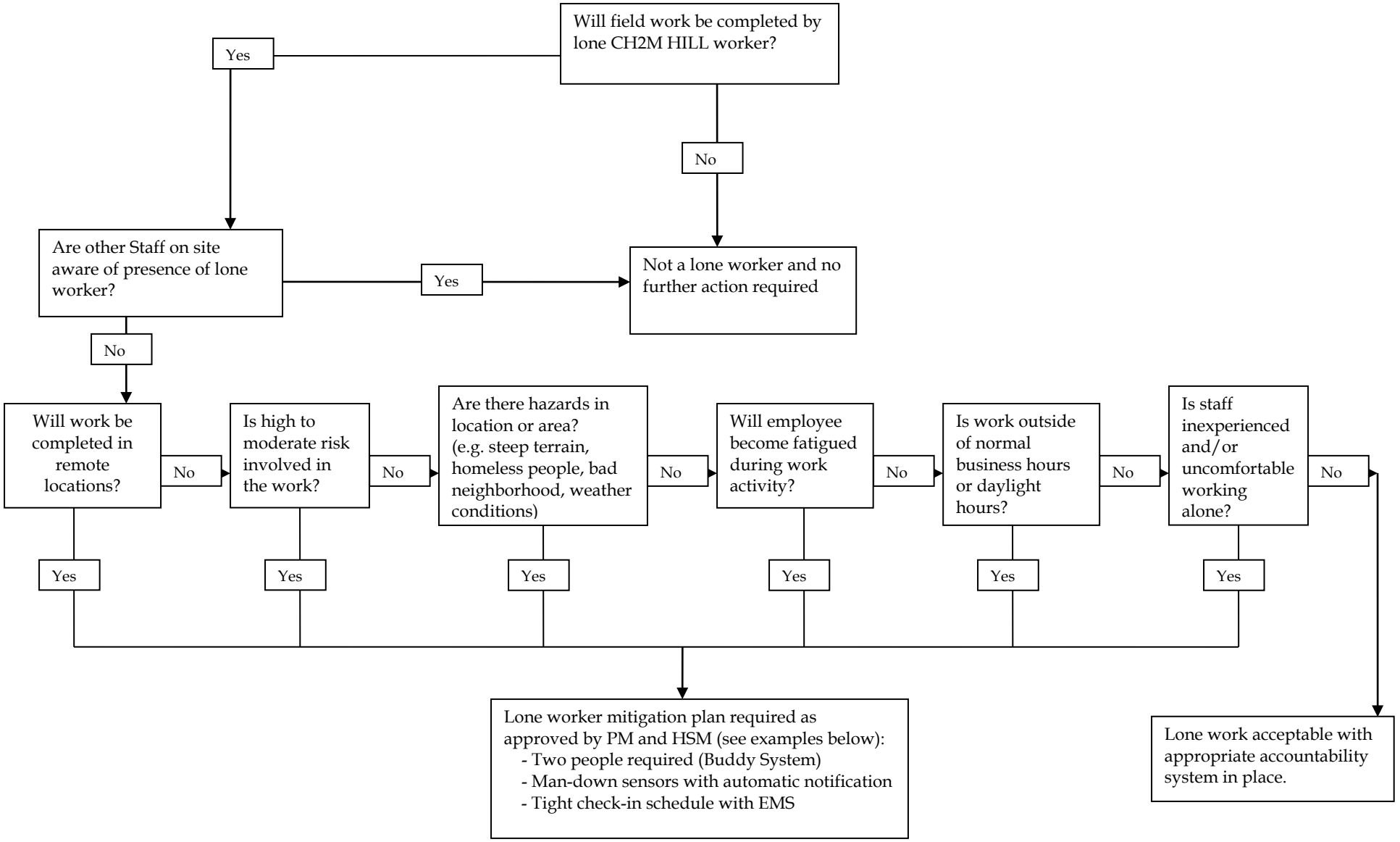
Specified Frequency and time for call in:_____

Time	Verified	Location

If lone worker fails to call in at specified frequency/time:

1) Call worker's radio and cell to determine if an emergency exists.
2) If no reply, immediately call Client security/emergency service if there is one at the site.
3) If there is no client security call Emergency Services (911). Inform the dispatcher there is a lone worker that cannot be contacted and there may be an emergency on site. Provide the lone worker's name, their last known location, and your contact information.
4) After Emergency Services have been contacted, call the other emergency contacts, Project Manager, and Health and Safety Manager.

Lone Worker Protocol



CH2M HILL HEALTH AND SAFETY PLAN

Attachment 8

Tick Fact Sheet

Tick-Borne Pathogens — A Fact Sheet

Most of us have heard of Lyme disease or Rocky Mountain Spotted Fever (RMSF), but there are actually six notifiable tick-borne pathogens that present a significant field hazard. In some areas, these account for more than half of our serious field incidents. The following procedures should be applied during any field activity—even in places that are predominantly paved with bordering vegetation.

Hazard Recognition

An important step in controlling tick related hazards is understanding how to identify ticks, their habitats, their geographical locations, and signs and symptoms of tick-borne illnesses.

Tick Identification

There are five varieties of hard-bodied ticks that have been associated with tick-borne pathogens. These include:

- Deer (Black Legged) Tick (eastern and pacific varieties)
- Lone Star Tick
- Dog Tick
- Rocky Mountain Wood Tick

These varieties and their geographical locations are illustrated on the following page.

Tick Habitat

In eastern states, ticks are associated with deciduous forest and habitat containing leaf litter. Leaf litter provides a moist cover from wind, snow, and other elements. In the north-central states, is generally found in heavily wooded areas often surrounded by broad tracts of land cleared for agriculture.

On the Pacific Coast, the bacteria are transmitted to humans by the western black-legged (deer) tick and habitats are more diverse. For this region, ticks have been found in habitats with forest, north coastal scrub, high brush, and open grasslands. Coastal tick populations thrive in areas of high rainfall, but ticks are also found at inland locations.

Illnesses and Signs & Symptoms

There are six notifiable tick-borne pathogens that cause human illness in the United States. These pathogens may be transmitted during a tick bite—normally hours after attachment. The illnesses, presented in approximate order of most common to least, include:

- Lyme (bacteria)
- RMSF (bacteria)
- Ehrlichiosis (bacteria)
- STARI (Southern Tick-Associated Rash Illness) (bacteria)
- Tularemia (Rabbit Fever) (bacteria)
- Babesia (protozoan parasite)

Symptoms will vary based on the illness, and may develop in infected individuals typically between 3 and 30 days after transmission. Some infected individuals will not become ill or may develop only mild symptoms. These illnesses present with some or all of the following signs & symptoms: fever, headache, muscle aches, stiff neck, joint aches, nausea, vomiting, abdominal pain, diarrhea, malaise, weakness, small solid, ring-like, or spotted rashes. The bite site may be red, swollen, or develop ulceration or lesions. For Lyme disease, the bite area will sometimes resemble a target pattern. A variety of long-term symptoms may result if the illness is left untreated, including debilitating effects and death.

Deer Tick

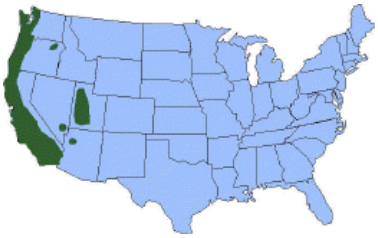
From Left: adult female, adult male, nymph, and larvae Deer Tick (cm scale)

Lone Star Tick

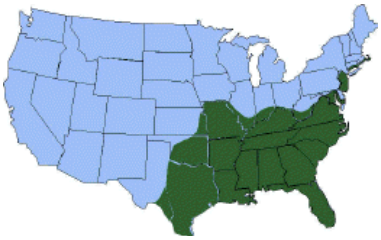
Dog Tick

Rocky Mountain Wood Tick

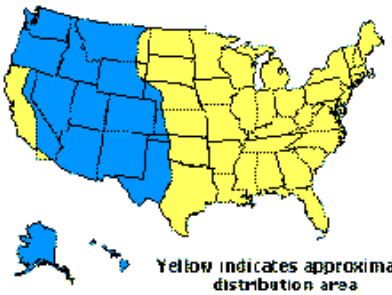
Distribution of Deer Tick (dark green)

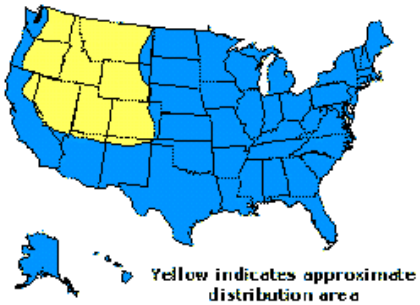


Distribution of Pacific Deer Tick (dark green)



Distribution of Lone Star Tick (Green)





Hazard Control

The methods for controlling exposure to ticks include, in order of most- to least-preferred:

- Avoiding tick habitats and ceasing operations in heavily infested areas
- Reducing tick abundance through habitat disruption or application of acracide
- Personal protection through use of repellants and protective clothing
- Frequent tick inspections and proper hygiene

Vaccinations are not available and preventative antibiotic treatment after a bite is generally not recommended.

Avoidance and Reduction of Ticks

To the extent practical, tick habitats should be avoided. In areas with significant tick infestation, consider stopping work and withdrawing from area until adequate tick population control can be achieved. Stopping and withdrawing should be considered as seriously as entering an area without proper energy control or with elevated airborne contaminants—tick-borne pathogens present risk of serious illness!

In areas where significant population density or infestation exists, tick reduction should be considered. Tick reduction can be achieved by disrupting tick habitats and/or direct population reduction through the use of tick-toxic pesticides (Damminix, Dursban, Sevin, etc.).

Habitat disruption may include only simple vegetative maintenance such as removing leaf litter and trimming grass and brush. Tick populations can be reduced by between 72 and 100 percent when leaf litter alone is removed. In more heavily infested areas, habitat disruption may include grubbing, tree trimming or removal, and pesticide application (Damminix, Dursban, Sevin, etc.). This approach is practical in smaller, localized areas or perimeter areas that require occasional access. Habitat controls are to be implemented with appropriate health and safety controls, in compliance with applicable environmental requirements, and may be best left to the property owner or tenant or to a licensed pesticide vendor. Caution should be exercised when using chemical repellents or pesticides in or around areas where environmental or industrial media samples will be collected for analysis.

Personal Protection

After other prevention and controls are implemented, personal protection is still necessary to control exposure to ticks. Personal protection must include all of the following steps:

- Where site conditions warrant (vegetation above knee height, tick endemic area) or when tasks warrant (e.g., having to sit/kneel in vegetation) that diminish the effectiveness of the other controls mentioned above, bug-out suits (obtained from MKE warehouse)/Tyvek shall be used. Bug-out suits are more breathable than Tyvek.
- So that ticks may be easily seen, wear light-colored clothing. Full-body New Tyvek (paper-like disposable coveralls) may also be used
- To prevent ticks from getting underneath clothing tuck pant legs into socks or tape to boots
- Wear long-sleeved shirts, a hat, and high boots
- Apply DEET repellent to exposed skin or clothing per product label
- Apply permethrin repellent to the outside of boots and clothing before wearing, per product label
- Frequently check for ticks and remove from clothing
- At the end of the day, search your entire body for ticks (particularly groin, armpits, neck, and head) and shower
- To prevent pathogen transmission through mucous membranes or broken/cut skin, wash or disinfect hands and/or wear surgical-style nitrile gloves any time ticks are handled

Pregnant individuals and individuals using prescription medications should consult with their physician and/or pharmacists before using chemical repellents. Because human health effects may not be fully known, use of chemical repellents should be kept to a minimum frequency and quantity. Always follow manufacturers' use instructions and precautions. Wash hands after handling, applying, or removing protective gear and clothing. Avoid situations such as hand-to-face contact, eating, drinking, and smoking when applying or using repellents.

Remove and wash clothes per repellent product label. Chemical repellents should not be used on infants and children.

Vaccinations are generally not available for tick-borne pathogens. Although production of the LYMErix™ Lyme disease vaccination has been ceased, vaccination may still be considered under specific circumstances and with concurrence from the consulting physician.

Tick Check

A tick check should be performed after field survey before entering the field vehicle (you do not want to infest your field vehicle with ticks). Have your field partner check your back; the backs of your legs, arms, and neck; and your hairline. Shake off clothing as thorough as possible before entering the vehicle. Once the field day is complete, repeat this procedure and perform a thorough self check.

If a tick has embedded itself into the skin, remove the tick as described below.

Tick Removal

1. Use the tick removal kit obtained through the CH2M HILL Milwaukee warehouse, or a fine-tipped tweezers or shield your fingers with a tissue, paper towel, or nitrile gloves.

Tick Bites\Tick Remover.pdf

2. Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. If this happens,

remove mouthparts with tweezers. Consult your healthcare provider if infection occurs.

3. Avoid squeezing, crushing or puncturing the body of the tick because its fluids (saliva, hemolymph, gut contents) may contain infectious organisms. Releasing these organisms to the outside of the tick's body or into the bite area may increase the chance of infectious organism transmission.

4. Do not handle the tick with bare hands because infectious agents may enter through mucous membranes or breaks in the skin. This precaution is particularly directed to individuals who remove ticks from domestic animals with unprotected fingers. Children, elderly persons, and immunocompromised persons may be at greater risk of infection and should avoid this procedure.

5. After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

6. You may wish to save the tick for identification in case you become ill. Your doctor can use the information to assist in making an accurate diagnosis. Place the tick in a plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.

Note: Folklore remedies such as petroleum jelly or hot matches do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided. In addition, a number of tick removal devices have been marketed, but none are better than a plain set of fine tipped tweezers.

First-Aid and Medical Treatment

Tick bites should always be treated with first-aid. Clean and wash hands and disinfect the bite site after removing embedded tick. Individuals previously infected with Lyme disease does not confer immunity—re-infection from future tick bites can occur even after a person has contracted a tick-borne disease.

CH2M Hill has a protocol in place for employees who have experienced a tick bite due to work-related activities, to test all ticks that have been removed from them for the presence of Borrelia burgdorferi.

The employee should contact the Injury Management/Return To Work provider (IMRTW), WorkCare using the toll-free number 866-893-2514 to report the tick bite. WorkCare will follow-up with each CH2M Hill employee who reports a tick bite and is at risk of developing Lyme disease by monitoring for symptoms up to 45 days, and will refer the employee to a medical provider for evaluation and treatment as necessary

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 9

Notice of Safety Violation Form

Notice of Safety Violation

REPORT PREPARED BY:

Name:	**Title:**	**Signature:**	**Date:**

VIOLATION:

Description:	Date:
	_____

SUBCONTRACTOR SIGNATURE OF NOTIFICATION:

Name:	**Title:**	**Signature:**	**Date:**

**** Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.****

SUBCONTRACTOR'S CORRECTIVE ACTION

Description:	Date of Nonperformance:
	_____

SUBCONTRACTOR SIGNATURE OF CORRECTION

Name:	**Title:**	**Signature:**	**Date:**

CH2M HILL HEALTH AND SAFETY PLAN

Attachment 10

Stop Work Order Form

Stop Work Order

REPORT PREPARED BY:

Name:	**Title:**	**Signature:**	**Date:**

ISSUE OF NONPERFORMANCE:

Description:	Date of Nonperformance:

SUBCONTRACTOR SIGNATURE OF NOTIFICATION:

Name:	**Title:**	**Signature:**	**Date:**

**** Corrective action is to be taken immediately. Note below the action taken, sign and return to CCI.* Work may not resume until authorization is granted by CH2M HILL Constructors, Inc. Representative,***

SUBCONTRACTOR'S CORRECTIVE ACTION

Description:	Date of Nonperformance:

SUBCONTRACTOR SIGNATURE OF CORRECTION

Name:	**Title:**	**Signature:**	**Date:**

Vehicle Accident Guidance

Vehicle Accident Guidance

For All Vehicles--Call the Police

For any vehicle accident/damage, it is recommended that the local police (or site security/emergency services if working on a client site that provides such services) be called to determine if a report needs to be filed. In some instances, a report may not be required (during accident alerts, or in public parking lots). Document that the authorities were called and follow up with any guidance they give you. State requirements vary. If a report is filed, obtain a copy.

For Fleet Vehicles:

Definition: These are vehicles **rented for greater than 90 days** or rentals that are **leased** (either through ARI [Automotive Rental, Inc.] or leases from other companies [older fleet vehicles].

Report the accident to the following:

Contact Company Insurance Carrier: Zurich (1-877-246-3478 or 1-800-987-3373).

Contact Corp. Insurance - Linda George/DEN at 720-286-2057.

Note: If you are an ES employee that happens to use an **OMI vehicle** on a project and get into an accident, you must also contact Michelle Garlington/DEN (720-286-4273).

For Rentals:

Report the accident to the following:

Call 1-800-VISA-911 (**only** if the car has been **rented for less than 31 days**—they provide some additional physical damage coverage in this time period).

Call Zurich (1-877-246-3478 or 1-800-987-3373). Carry available insurance cards which can be downloaded from the VO. For short-term rental (non CH2M Owned), carry the insurance card from the state where the driver's license was issued. For fleet vehicles, carry the insurance card from the state where the vehicle is registered.
https://communities.int.ch2m.com/legal/insurance/Shared%20Documents/AutoID_Cards.aspx?PageView=Shared

Call the rental company (Budget, National, Enterprise, etc.).

Call Linda Anderson/DEN at 720-286-2401.

For All Vehicles:

Notify Supervisor, (and PM/RHSM if working on a project site)

If you are injured, call 911 for emergency medical treatment or 1-866-893-2514 to contact the CH2M HILL Occupational Nurse/Physician for minor injuries. If you initially feel you have not been injured, contact the RHSM for guidance on whether calling the CH2M HILL Occupation Nurse/Physician is applicable.

Complete a HITS report on the VO.

Personally Owned Vehicles (POVs):

CH2M HILL does not provide auto insurance for POVs, it is responsibility of the owner. If you are in a vehicle accident conducting company business, contact the police as above, supervisor, and 911 or CH2M HILL's occupational nurse/physician as stated above. Complete a HITS report. Refer to the Employee Handbook/Policies, assistance for meeting personal insurance deductibles (up to $500 is available).

If using your POV for extended project use, notify the PM to make sure a rental car is not needed. Check your insurance policy for guidance on using the POV for business use.