AECOM

Environment

Prepared for
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Submitted to
Washington Department of Ecology

60569792
October 2018

First Semiannual 2018 Groundwater Monitoring Report

Tesoro Pasco Bulk Fuel Terminal

2900 Sacajawea Park Road
Pasco, Washington
Cleanup Site ID: 4867
Facility Site ID: 55763995

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October 11, 2018

Christer Loftenius
Hydrogeologist
Washington State Department of Ecology
Eastern Regional Office
4601 North Monroe Street
Spokane, WA 99205
clof461@ecy.wa.gov (hard copy and electronic copy)

Re: First Semiannual 2018 Groundwater Monitoring Report
Tesoro Pasco Bulk Fuel Terminal
2900 Sacajawea Park Road
Pasco, Washington
Cleanup Site ID: 4867
Facility Site ID: 55763995

Dear Mr. Loftenius:

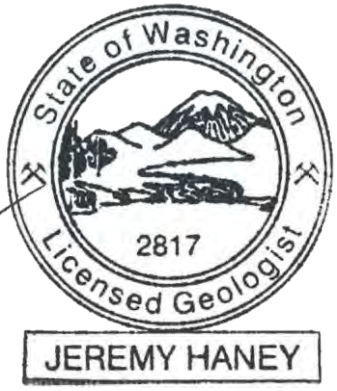
The attached report has been prepared by AECOM on behalf of Tesoro Logistics Operations, LLC. This report describes the results of the first semiannual groundwater monitoring event for 2018 at the Tesoro Pasco Bulk Fuel Terminal. If you have any questions or require additional information, please contact me at (503) 478-2765.

Sincerely,

AECOM

Nicky Moody
Project Manager

Jeremy Haney, L.G.
Geologist



cc: Anastasia E. Duarte, Tesoro Refining and Marketing Company, 3450 S. 344th Way, Suite 135, Auburn, WA (electronic only)

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1 Introduction

AECOM has prepared this First Semiannual 2018 Groundwater Monitoring Report on behalf of Tesoro Logistics Operations, LLC. (Tesoro) for the Tesoro Pasco Bulk Fuel Terminal. This report summarizes the results of the 2018 first semiannual groundwater monitoring event.

1.1 Site Information

This section only includes a summary of the project information; additional background information, location, and history including historical groundwater data tables are provided as Appendix A.

Chevron Pipeline Company (CPL) operated the Pasco Bulk Fuel Terminal (the facility) from 1950 until Tesoro Logistics Operations LLC (Tesoro) purchased the facility in June 2013. Tidewater Terminal Company, Inc. (Tidewater) owns and operates fuel pipelines within a three-acre easement that crosses the facility. The area within the northwest corner of the facility, labeled on Figure 2 as the Tidewater site, includes the area of a pipeline fuel release that occurred in July 2000 (see Appendix A). Tidewater is responsible for managing ongoing environmental activities in this portion of the facility.

Since the purchase from CPL and the separation of the remedial investigation activities at the Tidewater site from the remainder of the facility in July 2015, Tesoro has been responsible for managing ongoing environmental activities within the facility exclusive of the Tidewater area (the Site); this area is labeled as the Site on Figure 2. The Site is listed on the Washington State Department of Ecology (Ecology) Cleanup Site Identification (ID) 4867.

The Site is located at 2900 Sacajawea Park Road in Pasco, within the north half of the southwest quarter of Section 35 in Township 9 North and Range 30 East in Franklin County, Washington (Figure 1). The Site consists of aboveground storage tanks (ASTs), loading racks, pumping stations, underground and aboveground pipelines, a barge loading dock, a lined evaporation pond, and terminal offices (Azure, 2014).

The Site has been an active fuel terminal since September 1950 and receives fuel products through underground pipelines and is capable of receiving fuel products by barge. Twenty-one ASTs ranging from 10,000 to 50,000 gallons (Azure, 2014) are used to store diesel, gasoline, jet fuel, and ethanol (URS, 2011).

The Site is adjacent to the Lake Wallula portion segment of the Snake River and surrounded by unimproved land to the southwest, north, and northeast. The elevation at the Site ranges from approximately 356 feet National Geodetic Vertical Datum (NGVD) along the river to approximately 425 feet NGVD in the upland portion of the Site where the storage tanks are located (URS, 2011). A Burlington Northern Santa Fe (BNSF) rail spur runs though the Site along the Snake River.

1.2 Groundwater Monitoring Network and Program

Fourteen monitoring wells (MW-1 through MW-14) and one recovery well (RW-1) have been installed at the Site as shown on Figures 2 through 4. These wells are active and included in the monitoring well network with the following exceptions:

- MW-1 and RW-1 were buried during construction work as of December 2017 and May 2014, respectively (CEECON, 2017). Permanent abandonment of MW-1 and RW-1 was proposed by CEECON Testing, Inc. (CEECON) in December 2017 (CEECON, 2017) and approved by Ecology on April 19, 2018 (Ecology, 2018). Both wells were permanently decommissioned during the third quarter of 2018 the details of which will be described in a subsequent deliverable.
- MW-5 and MW-9 were destroyed in 1987 (URS, 2011).
- MW-13 was installed above the water table (URS, 2011).

The current monitoring program is directed in accordance with Section 4.5 of the *Supplemental RI/FS Work Plan*. According to the *Supplemental RI/FS Work Plan*, semiannual groundwater monitoring will continue until a new Draft Cleanup Action Plan (DCAP) is implemented for the Site. The current groundwater monitoring schedule is summarized below and included in Table 1 (CEECON, 2016).

- Depth-to-groundwater measurements are collected semiannually from all 10 active monitoring wells: MW-2 through MW-4, MW-6 through MW-8, MW-10 through MW-12, and MW-14.
- Groundwater samples are collected during the first semiannual monitoring event from all 10 active monitoring wells: MW-2 through MW-4, MW-6 through MW-8, MW-10 through MW-12, and MW-14.
- Groundwater samples are collected during the second semiannual monitoring event from the following seven monitoring wells: MW-2, MW-3, MW-6, MW-7, MW-11, MW-12, and MW-14.

2 Groundwater Monitoring and Sampling Activities and Results

CEECON conducted the first semiannual 2018 monitoring event on June 11 through 14, 2018. The groundwater monitoring and sampling activities are discussed in this section.

2.1 Monitoring Well Gauging Field Activities and Monitoring Results

Prior to purging and sampling, CEECON collected depth-to-groundwater measurements from all 10 active monitoring wells in accordance with Section 1.2 and Table 1. Depth-to-groundwater measurements were collected from the well top of casing (TOC) using an electronic water level meter and were recorded on the Water Quality Sampling Information forms, which are included in Appendix B.

The depth-to-groundwater measurements and groundwater elevations (calculated from the surveyed TOC elevations) for this event are listed on Table 2 and Table A1 in Appendix A with the historical data. Using the calculated groundwater elevations for this event, a groundwater elevation contour map was prepared as Figure 3.

During this event, groundwater elevations ranged from 342.88 feet[a] at MW-6 to 344.39 feet[a] at MW-2. Based on these groundwater elevations, groundwater at the Site appears to generally flow to the south.

The Lake Wallula water elevation was approximately 341.37 feet[a], which is approximately 2 feet above the 10-year annual average elevation and approximately 1.5 feet above the 10-year average for the same period in May. The average water elevation for the past 10 years is approximately 339.38 feet[a] while the historic minimum and maximum elevations are 335.17 feet[a] and 343.71 feet[a], respectively.

2.2 Groundwater Sampling Field Activities

During this event, CEECON collected groundwater samples from all 10 active monitoring wells in accordance with Section 1.2 and Table 1.

The monitoring wells were purged and sampled using standard low-flow sampling techniques. The purge water was field-analyzed for the following parameters: pH, conductivity, dissolved oxygen (DO), temperature, and oxidation reduction potential (ORP). Copies of the Water Quality Sampling Information forms, which include field parameters, are included in Appendix B. The final stabilized field parameters from this event are tabulated as part of the natural attenuation analysis on Table 3 and Table A2 in Appendix A with the historical data.

CEECON field personnel wore disposable nitrile gloves while collecting and handling the groundwater samples. Sample containers were tightly sealed, uniquely labeled, and stored on ice for transportation to the laboratory. CEECON delivered the samples to TestAmerica Seattle in Tacoma, Washington and followed chain-of-custody (COC) procedures from sample collection to sample analysis. A copy of the COC form is included in Appendix C with the complete laboratory analytical report.

2.3 Groundwater Analytical Methods and Results

This section summarizes the groundwater analytical methods and results.

2.3.1 Groundwater Analytical Methods

CEECON submitted 10 primary groundwater samples and one field duplicate for analysis of the following constituents in accordance with Section 4.5 of the *Supplemental RI/FS Work Plan*:

- Total petroleum hydrocarbons, gasoline range (TPH-g) using Washington Method NWTPH-Gx
- Total petroleum hydrocarbons, diesel range (TPH-d) and total petroleum hydrocarbons, oil range (TPH-o) using Washington Method NWTPH-Dx

[a] North American Vertical Datum of 1929 (NAVD29)

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, lead scavengers (1,2-dibromeoethane [EDB] and 1,2-dichloroethane [EDC]), and fuel oxygenates (di-isopropyl ether [DIPE], ethyl tertiary-butyl ether [ETBE], methyl tertiary-butyl ether [MTBE], tertiary-butyl alcohol [TBA], and tertiary-amyl methyl ether [TAME]) using Environmental Protection Agency (EPA) Method 8260C
- Fuel oxygenates ethanol and methanol using EPA Method 8015C

One trip blank was submitted for analysis of TPH-g, BTEX, EDB, EDC, DIPE, ETBE, MTBE, TBA, and TAME.

The analytical laboratory report and COC form are included in Appendix C. A data validation was also completed on the analytical results, which is provided as a Data Review Report in Appendix C.

2.3.2 Groundwater Analytical Results

The current groundwater analytical results for this event are listed in Table 2 and Appendix A, Table A1 with the historical results. In addition, the TPH-g, TPH-d, and TPH-o analytical results for this event are included on Figure 4.

The analytical detections for the 10 primary groundwater samples collected during this event are summarized below.

- TPH-g, BTEX, naphthalene, all the lead scavengers, and all the fuel oxygenates were not detected in any of the ten groundwater samples.
- TPH-d was detected in the groundwater samples from MW-2, MW-3, MW-6, MW-11, MW-12, and MW-14.
- TPH-o was detected in the groundwater samples from MW-2, MW-3, and MW-6.

The groundwater analytical results were compared to the Ecology Model Toxic Control Act (MTCA) Method A Cleanup Levels (herein referred to as the MTCA cleanup levels) on Table 2 and Figure 4. The results of this comparison are summarized below:

- Both TPH-d and TPH-o were detected at concentrations greater than their respective MTCA cleanup levels in the groundwater sample from MW-3.

These analytical results are generally in line with the historical analyte concentrations (Table A1 in Appendix A).

2.4 Natural Attenuation Evaluation

The natural attenuation results provide additional data documenting conditions of petroleum hydrocarbon degradation processes in groundwater. This section summarizes the natural attenuation parameter methods and results.

Assessment of natural attenuation included collection of additional parameters. The groundwater samples were collected at select wells representing background and source areas to provide additional information to evaluate if natural attenuation processes are active at the Site.

The additional parameters can be divided into two groups:

- Direct measurement of electron acceptors (e.g., DO, ORP, sulfate, and nitrate)
- Indirect measurement of byproduct(s) of the partially or fully metabolized electron acceptor (e.g., manganese, ferrous iron, methane, and alkalinity)

Contaminant degrading microorganisms will utilize the most efficient electron acceptors under the prevailing redox conditions, while creating metabolic by-products. For example, oxygen (as measured by DO and ORP) is consumed in aerobic respiration to create carbon dioxide (CO_2) while the other electron acceptors are consumed in anaerobic respiration: ferric iron (Fe^{3+}) to create soluble ferrous iron (Fe^{2+}), nitrate to create elemental nitrogen, manganese (Mn^{4+}) to create soluble manganese (Mn^{2+}), and sulfate to create sulfide (Newell et.al., 1995).

When evaluating these parameters, the occurrence of natural attenuation is indicated by either a relatively reduced level of the electron acceptors or an elevated level of the metabolic by-products in locations within and external to the contaminant plume.

2.4.1 Types of Natural Attenuation Parameters and Analytical Methods

Natural attenuation parameters collected during this event in accordance with Table 1 include the following:

- Field parameters (pH, conductivity, DO, temperature, and ORP) collected during the sampling of all 10 monitoring wells
- Ferrous iron and nitrate measurements collected using field test kits during the sampling of the following four monitoring wells: MW-2, MW-6, MW-8, and MW-12.

Natural attenuation laboratory analytical testing on groundwater samples collected at the following four monitoring wells: MW-2, MW-6, MW-8, and MW-12. These four samples were submitted to TestAmerica for analysis of the following:

- Dissolved manganese (laboratory filtered) using EPA Method 200.7
- Sulfate using EPA Method 300
- Alkalinity using Standard Method 2320B
- Methane using method RSK 175

The field parameters, ferrous iron measurements, and nitrate measurements were recorded on the Water Quality Sampling Information forms included in Appendix B.

The analytical laboratory report and COC form are included in Appendix C. A data validation was also completed on the analytical results, which is provided as a Data Review Report in Appendix C.

2.4.2 Natural Attenuation Parameter Results

The natural attenuation parameter results from this event are tabulated on Table 3 and Table A2 in Appendix A with the historical data and summarized below.

- pH was neutral ranging from 6.57 to 7.49 at MW-12 and MW-4, respectively.
- Conductivity ranged from 0.730 milliseimens per centimeter (mS/cm) to 1.16 mS/cm at MW-10 and MW-2, respectively.
- DO readings were typical of aerobic conditions, ranging from 1.95 milligrams per liter (mg/L) to 8.38 mg/L at MW-12 and MW-6, respectively.
- Positive ORP measurements (suggesting oxidizing conditions) were recorded at all the monitoring wells sampled and ranged from 42 millivolts (mv) in MW-3 to 212 mv in MW-12.
- Ferrous iron was only detected in MW-3 (0.96 mg/L).
- Nitrate was detected in all four of the sampled monitoring wells and ranged from 8.09 mg/L in MW-6 to 42.9 mg/L in MW-8.
- Sulfate was detected in all four of the sampled monitoring wells and ranged from an estimated 96 mg/L in MW-6 to 120 mg/L in MW-8 and MW-12.
- Alkalinity was detected in all four of the sampled monitoring wells and ranged from 150 mg/L in MW-6 to 400 mg/L in MW-2.
- Manganese was only detected in MW-12 (0.043 mg/L).
- Methane was not detected in the four sampled monitoring wells.

The geochemical data continues to provide evidence that natural attenuation through biodegradation is occurring at the Site. Considering the geochemical indicators, oxidizing conditions, and the various factors discussed above, it appears aerobic biodegradation is ongoing and is likely substantially contributing to the continued attenuation of the petroleum hydrocarbons in groundwater.

- High DO concentrations and ORP values in the plume suggest aerobic biodegradation may be a significant degradation pathway.

- The presence of variable and high nitrate values could indicate biodegradation, through denitrification and the nitrate reduction process, is active seasonally or in isolated areas but is not the primary degradation pathway.
- Manganese and iron do not appear to be active degradation pathways.
- Anaerobic conditions favorable for sulfate reduction (including low DO concentrations and ORP levels less than -100mV) do not appear to be present or are only present seasonally in isolated areas at the Site.
- Methane is not present in the natural attenuation samples, indicating anaerobic biodegradation is currently not a significant degradation pathway at the Site.
- Increased alkalinity in groundwater samples with detectable concentrations of TPH-d and TPH-o suggest biodegradation may be occurring in the contaminant plume or along the periphery.

2.5 Investigation-Derived Waste

During this monitoring event, the field activities generated the following investigation-derived waste: purge water and miscellaneous wastes (sample tubing, gloves, paper towels, etc.). Miscellaneous wastes were managed as solid waste. The purge water was disposed of in the facility process-water treatment system.

3 Conclusions

During the first semiannual 2018 monitoring event, CEECON collected depth-to-groundwater measurements and groundwater samples from 10 wells in accordance with the current program. Conclusions from the first semiannual 2018 monitoring event are as follows:

- The groundwater flow direction is south at a variable hydraulic gradient.
- The detected analyte concentrations are generally similar to detected concentrations from previous events.
- Exceedances of the MTCA cleanup levels during this event are listed below:
  - TPH-d in MW-3
  - TPH-o in MW-3

The data from the monitoring event will be uploaded into Ecology's Environmental Information Management (EIM) database.

4 Limitations

The findings and conclusions documented in this report have been prepared for specific application to this project and have been developed in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area and in general accordance with the terms and conditions set forth in our Agreement. No warranty or other conditions express or implied should be understood.

The findings presented in this report are based on conditions observed at specific site locations and sampling intervals at the time of the assessment. Because conditions between the monitoring well locations or borings may vary over distance and time, the potential always remains for the presence of unknown, unidentified, unforeseen, or changed surface and subsurface contamination. Conclusions in this report are based on comparison of chemical analytical results to current regulatory standards.

This report is for the exclusive use of Tesoro and its representatives. No fourth party shall have the right to rely on AECOM's opinions rendered in connection with the services or in this report without our written consent, and the second party's agreement to be bound to the same conditions and limitations as Tesoro.

5 References

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Figures

SITE VICINITY MAP

TESORO LOGISTICS OPERATIONS, LLC
TESORO PASCO BULK FUEL TERMINAL
PASCO, WASHINGTON

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FIGURE 1

O:\60569792 (Tesoro Logistics Pasco-2018)\900-CAD, GIS\920 (GIS-Graphics)\MXD\Fig 1 Site Viciniy Map.mxd

Imagery Source: USGS, 2012

O:\60569792 (Tesoro Logistics Pasco-2018)\900-CAD_GIS\920 (GIS-Graphics)\MXD\Fig 2 Site Plan.mxd

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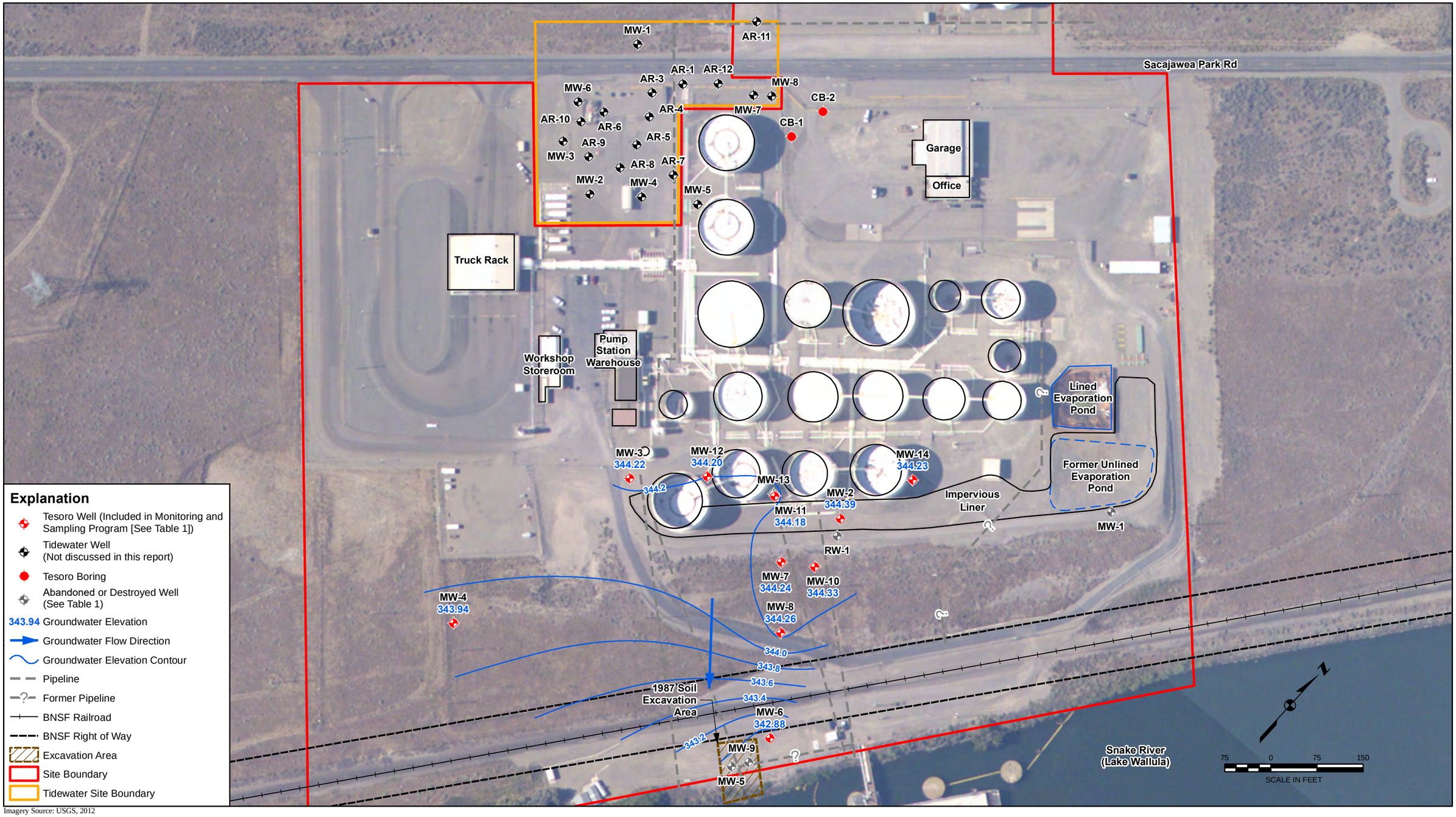
SITE PLAN

TESORO LOGISTICS OPERATIONS, LLC
TESORO PASCO BULK FUEL TERMINAL
PASCO, WASHINGTON

FIGURE 2



Imagery Source: USGS, 2012

O:\60569792 (Tesoro Logistics Pasco-2018)\900-CAD_GIS\920 (GIS-Graphics)\MXD\Fig 3 Groundwater Elevation Contour Map - June 2018.mxd

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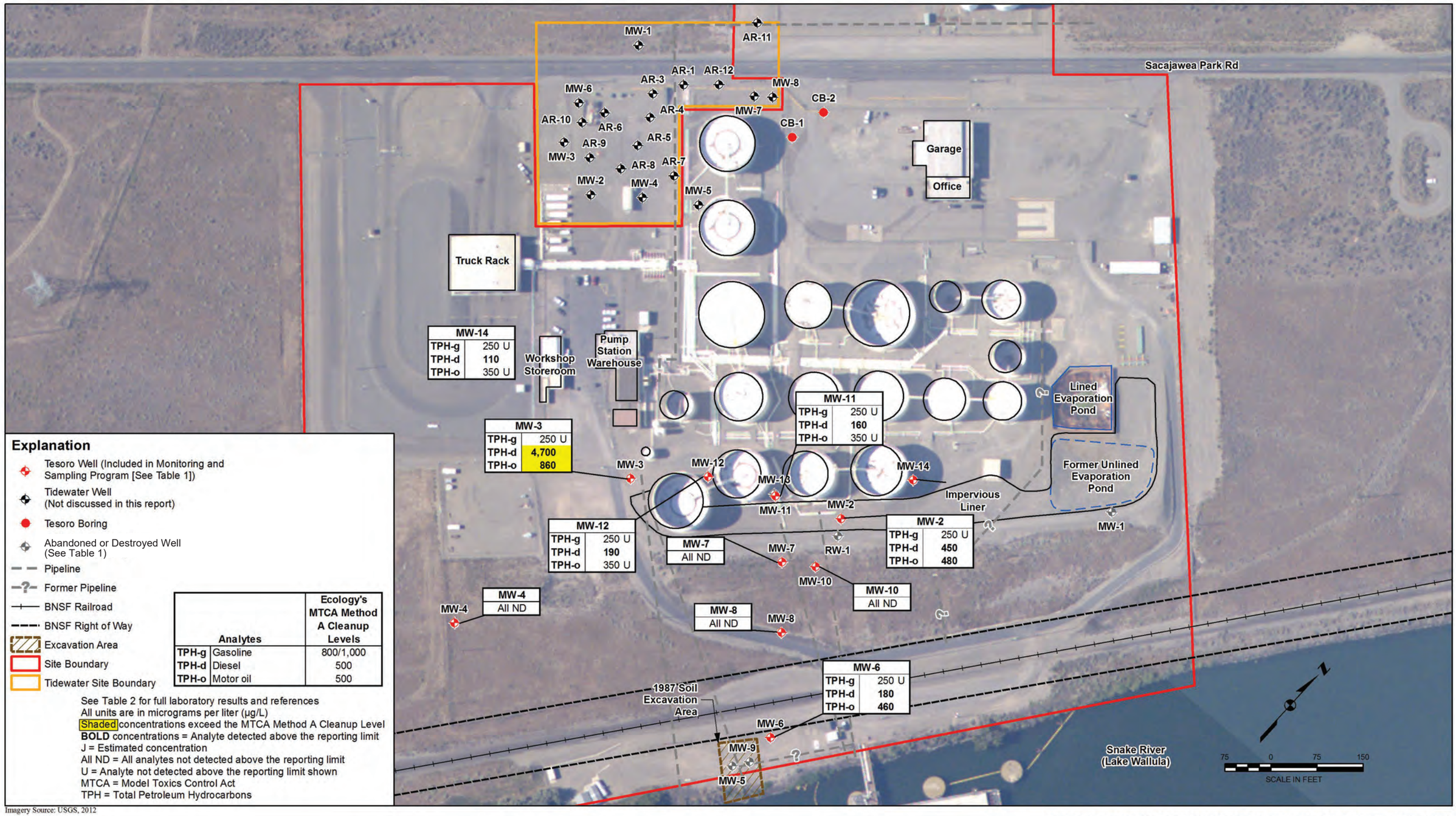
GROUNDWATER ELEVATION CONTOUR MAP – JUNE 2018

TESORO LOGISTICS OPERATIONS, LLC
TESORO PASCO BULK FUEL TERMINAL
PASCO, WASHINGTON

FIGURE 3



Explanation

- Tesoro Well (Included in Monitoring and Sampling Program [See Table 1])
- Tidewater Well (Not discussed in this report)
- Tesoro Boring
- Abandoned or Destroyed Well (See Table 1)
- Pipeline
- Former Pipeline
- BNSF Railroad
- BNSF Right of Way
- Excavation Area
- Site Boundary
- Tidewater Site Boundary

	Analytes	Ecology's MTCA Method A Cleanup Levels
TPH-g	Gasoline	800/1,000
TPH-d	Diesel	500
TPH-o	Motor oil	500

See Table 2 for full laboratory results and references
All units are in micrograms per liter (µg/L)
Shaded concentrations exceed the MTCA Method A Cleanup Level
BOLD concentrations = Analyte detected above the reporting limit
J = Estimated concentration
All ND = All analytes not detected above the reporting limit
U = Analyte not detected above the reporting limit shown
MTCA = Model Toxics Control Act
TPH = Total Petroleum Hydrocarbons

Imagery Source: USGS, 2012

Q:\60569792 (Tesoro Logistics Pasco-2018)\900-CAD, GIS\920 (GIS-Graphics)\MXD\Fig 4 Groundwater Analytical Data Summary Map - June 2018.mxd

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GROUNDWATER ANALYTICAL DATA SUMMARY MAP – JUNE 2018

TESORO LOGISTICS OPERATIONS, LLC
TESORO PASCO BULK FUEL TERMINAL
PASCO, WASHINGTON

FIGURE 4

Tables

Table 1. Groundwater Monitoring and Sampling Program Summary
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

									Monitoring and Sampling Program												
														Fuel Oxygenates		Natural Attenuation						
Well Type	**Well ID**	**Well Status**	**Install Date**	**Total Boring Depth** (feet bgs)	**TOC Elevation** (feet MSL) (1)	**Well Diameter** (inches)	**Well Screen Interval** (feet below bgs)	**Screen Length** (feet)	**Measure Depth to Groundwater** (During 1st/2nd SA)	**Collect Samples** (During 1st SA)	**Collect Samples** (During 2nd SA)	**TPH-g, TPH-d, & TPH-o** (NWTPH-Gx and NWTPH-Dx)	**VOCs: BTEX+N, EDB, & EDC** (EPA 8260C)	**DIPE, ETBE, MTBE, TBA, & TAME** (EPA 8260C)	**Ethanol & Methanol** (EPA 8015C)	**Field Parameters** (pH, Cond., DO, Temp, & ORP)	**Ferrous Iron & Nitrate** (Field Test Kits)	**Dissolved Manganese** (lab filtered) (200.7 Rev 4.4 - Metals)	**Sulfate** (EPA Method 300)	**Alkalinity** (SM 2320B)	**Methane** (RSK 175)	**QA/QC Samples**
Monitoring Wells	MW-1	Abandoned	11/83	93.9	419.40	4	73.9 - 93.9	20	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-2	Active	11/83	83.3	417.28	4	63.3 - 83.3	20	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--
	MW-3	Active	11/83	94.95	423.42	4	74.95 - 94.95	20	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--	--	--	--	--	--
	MW-4	Active	11/83	76.75	412.09	4	56.75 - 76.75	20	X	X	--	1st SA	1st SA	1st SA	1st SA	1st SA	--	--	--	--	--	--
	MW-5	Well destroyed	06/08/05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-6	Active	11/17/86	23.5	358.61	2	8.5 - 23.5	15	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--
	MW-7	Active	11/18/86	79	411.40	2	57 - 77	20	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--	--	--	--	--	--
	MW-8	Active	11/25/86	56	383.91	2	29 - 54	25	X	X	--	1st SA	1st SA	1st SA	1st SA	1st SA	1st SA	1st SA	1st SA	1st SA	1st SA	--
	MW-9	Well destroyed	11/20/86	26	--	2	10 - 25	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-10	Active	1/6/89	78.25	407.91	4	55 - 78	23	X	X	--	1st SA	1st SA	1st SA	1st SA	1st SA	--	--	--	--	--	--
	MW-11	Active	1/16/89	84.5	423.48	2	75 - 85	10	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--	--	--	--	--	--
	MW-12	Active	1/17/89	85	423.65	2	33 - 60 / 75 - 85	37	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	duplicate
	MW-13	Well always dry	1/17/89	48	424.07	2	18.5 - 47.5	29	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	MW-14	Active	1/17/89	82.5	421.97	2	27.5 - 53 / 72.5 - 82.5	36	X	X	X	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	1st/2nd SA	--	--	--	--	--	--
Recovery Wells	RW-1	Abandoned	1/4/89	105	417.29	8	64 - 98	34	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
(1) On July 12, 2018, the wells were resurveyed by Stratton Surveying and Mapping, P.C. The horizontal datum = Washington State Plane South Zone North American Datum 1983(1991). The vertical datum = North American Vertical Datum 29.

Acronyms:
-- = Not applicable or not sampled
BTEX = benzene, toluene, ethylbenzene, and total xylenes
Cond = conductivity
DG = down-gradient
DIPE = di-isopropyl ether
DO = dissolved oxygen
EDB = ethylene dibromide (1,2 dibromoethane)
EDC = ethylene dichloride (1,2 dichloroethane)
EPA = US Environmental Protection Agency
ETBE = ethyl tertiary-butyl ether
MSL = mean sea level
MTBE = methyl tertiary-butyl ether
ORP = oxidation reduction potential
QA = quality assurance
QC = quality control
SA = semiannual
SM = Standard Methods
SVE = soil vapor extraction
TAME = tertiary-amyl methyl ether
TBA = tertiary-butanol
Temp = temperature
TOC = top of casing
TPH = total petroleum hydrocarbons
TPH-g = gasoline range hydrocarbons (as analzyed by Northwest Method NWPTH-Gx)
TPH-d = diesel range hydrocarbons (as analyzed by Northwest Method NWTPH-Dx)
TPH-o = motor oil range hydrocarbons (as analyzed by Northwest Method TPH-Rx with silica gel cleanup)
UG = up-gradient
VOC = Volatile organic compounds

Table 2. Current Event Groundwater Monitoring and Analytical Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Sample Date	TOC Elevation (feet MSL) (1)	Depth to GW (feet below TOC)	GW Elevation (feet MSL) (1)	Total Petroleum Hydrocarbons			VOCs and Lead Scavengers							Fuel Oxgenates						
					TPH-g	TPH-d	TPH-o	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	DIPE	ETBE	MTBE	TBA	TAME	Ethanol	Methanol
Ecology's MTCA Method A Cleanup Levels (for groundwater) *(2)(3)*					800/1,000 [2]	500	500	*5*	*1,000*	*700*	*1,000*	*160*	*0.01*	*5*	*NE*	*NE*	*20*	*NE*	*NE*	*NE*	*NE*
				Units	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*mg/L*	*mg/L*
MW-2	6/14/18	417.28	72.89	344.39	250 U	**450**	**480**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-3	6/14/18	423.42	79.20	344.22	250 U	**4,700**	**860**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-4	6/13/18	412.09	68.15	343.94	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-6	6/11/18	358.61	15.73	342.88	250 U	**180**	**460**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-7	6/13/18	411.40	67.16	344.24	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-8	6/11/18	383.91	39.65	344.26	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-10	6/13/18	407.91	63.58	344.33	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-11	6/14/18	423.48	79.30	344.18	250 U	**160**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-12	6/14/18	423.65	79.45	344.20	250 U	**190**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-14	6/13/18	421.97	77.74	344.23	250 U	**110**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U

Notes:
Values in **bold** were detected above the limit
= Shaded values exceed Ecology's MTCA Method A Groundwater Cleanup Level.
-- = not sampled; not submitted for this analyte; or not gauged
Analytical results are compared to Ecology's MTCA Method A groundwater cleanup levels.
(1) On May 11, 2018, the wells were resurveyed by Stratton Surveying and Mapping, P.C. The horizontal datum = Washington State Plane South Zone North American Datum 1983(1991).
(2) Ecology's MTCA Method A Cleanup Levels for Groundwater (Washington Administrative Code 173-340-900 Table 720-1)
(3) Ecology's TPH-g MTCA Method A Cleanup Levels for Groundwater has two levels. If benzene is present in groundwater, the level is 800 ug/L; if no detectable benzene in groundwater, the level is 1,000 ug/L.

Acronyms:
µg/L = microgram per liter
DIPE = di-isopropyl ether
Ecology = Washington State Department of Ecology
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
ETBE = ethyl tertiary-butyl ether
ft = feet
GW = groundwater
J = Estimated Concentration
mg/L = milligram per liter
MSL = mean sea level
MTBE = Methyl tertiary-butyl ether
MTCA = Model Toxics Control Act
NE = MTCA Method A screening levels have not been established.
TAME = tertiary-amyl methyl ether
TBA = tertiary-butanol
TOC = top of casing
TPH = total petroleum hydrocarbon
TPH-g = gasoline range hydrocarbons (as analzyed by Northwest Method NWPTH-Gx)
TPH-d = diesel range hydrocarbons (as analyzed by Northwest Method NWTPH-Dx)
TPH-o = motor oil range hydrocarbons (as analyzed by Northwest Method TPH-Dx)
U = Analyte not detected above limit shown
VOC = Volatile organic compounds

Table 3. Current Natural Attenuation Parameter Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

		Field Parameters							Laboratory Analytical			
Location	**Date**	**pH**	**Conductivity**	**Dissolved Oxygen**	**Temperature**	**ORP**	**Ferrous Iron**	**Nitrate**	**Sulfate**	**Alkalinity**	**Manganese**	**Methane**
Units		S.U.	mS/cm	mg/L	°C	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-2	6/14/18	6.84	1.16	3.40	22.39	178	**0.96**	**11.0**	**110**	**400**	0.020 U	0.0050 U
MW-3	6/14/18	6.70	1.03	2.75	19.46	42	--	--	--	--	--	--
MW-4	6/13/18	7.49	0.813	7.56	20.99	161	--	--	--	--	--	--
MW-6	6/11/18	7.38	0.828	8.38	20.69	156	0.01 U	**8.09**	**96 J**	**150**	0.020 U	0.0050 U
MW-7	6/13/18	7.25	0.837	6.58	22.15	182	--	--	--	--	--	--
MW-8	6/11/18	7.28	0.866	7.46	19.77	175	0.01 U	**42.9**	**120**	**180**	0.020 U	0.0050 U
MW-10	6/13/18	7.35	0.730	4.96	28.26	178	--	--	--	--	--	--
MW-11	6/14/18	6.71	0.956	3.35	21.77	198	--	--	--	--	--	--
MW-12	6/14/18	6.57	1.12	1.95	18.69	212	0.01 U	**23.8**	**120**	**290**	**0.043**	0.0050 U
MW-14	6/13/18	7.06	0.908	5.14	20.22	188	--	--	--	--	--	--

Notes:
Values in **bold** were detected above the limit
-- = not sampled or not submitted for this analyte

Acronyms:
°C = degrees celsius
ft = feet
J = estimated concentration
mg/L = milligrams per liter
mS/cm = milliseimens per centimeter
mV = millivolts
ORP = Oxidation Reduction Potential
S.U. = Standard Unit
U = analyte not detected above limit shown

Appendix A
Site Background and History

Appendix A. Site Background and History

The following background and historical summary was prepared using information provided in the URS and CH2MHill *Remedial Investigation/Feasibility Study (RI/FS) Report* dated September 29, 2011 (URS, 2011b) and the Washington State Department of Ecology (Ecology) *Draft Cleanup Action Plan* (DCAP) dated December 2012 (Ecology, 2012).

A1. Ownership History and Facility/Site Definitions

Chevron Pipeline Company (CPL) operated the Pasco Bulk Fuel Terminal (the facility) from 1950 until Tesoro Logistics Operations LLC (Tesoro) purchased the facility in June 2013. Tidewater Terminal Company, Inc. (Tidewater) owns and operates fuel pipelines within a three-acre easement that crosses the facility.

The area within the northwest corner of the facility, labeled on Figure 2 as the Tidewater site, includes the area of a pipeline fuel release that occurred in July 2000. Tidewater is responsible for managing ongoing environmental remediation activities in this portion of the facility.

Since the purchase from CPL and the separation of the remedial investigation activities at the Tidewater site from the remainder of the facility in July 2015, Tesoro has been responsible for managing ongoing environmental activities within the facility exclusive of the Tidewater area (the Site); this area is labeled as the Site on Figure 2.

A2. Site Location and Description

The Site is located at 2900 Sacajawea Park Road in Pasco, Washington, on the north bank of the Snake River (Lake Wallula) (Figures 1 and 2).

The Site consists of approximately 33-acres of land used for transfer and bulk storage of refined fuels that include gasoline, diesel, and jet fuel. Twenty-one aboveground storage tanks (ASTs) that vary in storage capacity between approximately 10,000 to 50,000 gallons (Azure, 2014) are present on-site, in addition to eight fuel additive ASTs with capacities between 500- and 12,000-gallons. The Site also includes a 23,000-gallon capacity relief AST, underground and aboveground pipelines, rail spur, truck loading rack, barge loading dock, pumping stations, evaporation pond, and terminal office areas. Underground pipelines that cross the Site include two fuel supply pipelines that originate from Tesoro's Salt Lake City refinery. The pipelines are oriented along a northwest-southeast direction at the Site with the dormant south pipeline (6-inch diameter) historically used to transport unleaded gasoline and diesel fuel and the active north pipeline (8-inch diameter) used for jet fuel and other liquid petroleum hydrocarbon products (Figure 2). Tidewater operates a fuel transfer pipeline that exits the northwest area of the Site, and turns northeast along Sacajawea Park Road toward the location of the Tidewater Terminal. Additional pipelines that are no longer in operation were reportedly located at the eastern area of the Site and near the Snake River shoreline (Figure 2). A reported unlined evaporation pond was formerly located adjacent to the current lined evaporation pond at the eastern area of the Site (Figure 2).

The Site is surrounded by unimproved vacant land on three sides with limited, periodic agricultural land use. The Site has relatively flat topography with an elevation of approximately 420 feet above mean sea level (MSL) in the upland bluff area where the ASTs and truck loading facilities are located. A relatively steep land slope is present at the southeast area of the Site and drops to a relatively flat and narrow bench area along the Snake River, where the barge loading dock is located. The Snake River (Lake Wallula) surface water elevation is approximately 350 feet MSL, with river flow and lake level controlled by dams.

A3. Regulatory History

Ecology conducted an initial investigation of the site-wide facility in December 2000, and informed CPL by letter on December 12, 2000 that the Site would be listed on Ecology's Hazardous Sites database.

On December 4, 2009, Ecology issued Agreed Order No. DE 7294 to CPL and Tidewater to conduct a site-wide RI/FS.

The site-wide RI/FS was issued on September 29, 2011 and included the following findings:

- Liquid phase petroleum hydrocarbons have been sufficiently removed and addressed.

- Residual dissolved-phase petroleum hydrocarbons still remain on-site within localized areas. The lateral extent of the dissolved-phase plume has continued to decrease since remedial actions were discounted.

In December 2012, Ecology issued the DCAP and selected Alternative 1, which includes monitored natural attenuation (MNA) coupled with passive bioventing, as the cleanup action for the site-wide facility. Alternative 1 includes a restriction on groundwater use; no groundwater may be taken from the site except for use related to the cleanup, such as groundwater monitoring. Alternative 1 also requires groundwater monitoring continue to confirm natural attenuation is reducing the contamination to below the cleanup levels for a minimum of four consecutive sampling events in accordance with the December 2012 Compliance Monitoring Plan (URS, 2012).

In July 2015, after completion of borings CB-1 and CB-2 in June 2015, Ecology separated the facility into two distinct and unique sites: 1) the Site and 2) the Tidewater site.

On March 31, 2016, Ecology issued Agreed Order No. DE 12989 to Tesoro for the Site. This order required Tesoro to perform a supplemental RI including the completion of a Supplemental RI/FS Work Plan, RI field investigations, and a Supplemental RI/FS Report.

The *Supplemental RI/FS Work Plan* was issued for the Site on March 31, 2016, and the RI field investigations are currently on-going. The current monitoring program is directed in accordance with Section 4.5 of the *Supplemental RI/FS Work Plan*. According to the *Supplemental RI/FS Work Plan*, semiannual groundwater monitoring will continue until a new DCAP is implemented for the Site.

A4. Hydrocarbon Release and History

A total of 27 events of fuel hydrocarbon releases from storage tanks, pipelines and loading racks are documented for the Site during the period between 1972 and 2009 (URS, 2011b). The historical releases vary in estimated volumes between a few gallons and approximately 41,000 gallons per event, but the volume of at least one release is unknown (URS, 2011b). Many of the releases were contained and are not reported to have come in contact with surface soil.

The most significant documented releases occurred in the upland area of the Site, including the following four events (URS, 2011b):

- 665 barrels (27,930 gallons) of diesel released from Tank 8 in March 1976
- 600 barrels (25,200 gallons) of gasoline released from Tank 13 in December 1978
- 610 barrels (25,620 gallons) of gasoline released from Tank 17 in February 1984
- 976 barrels (41,000 gallons) of gasoline released from the Tidewater transfer pipeline in July 2000

The estimated volume of hydrocarbons recovered within a short period following the discovery of these four historic releases varied between approximately 12% and 33% of the estimated volume released in the CPL events, and approximately 85% recovery within a relatively short period following the Tidewater event (URS, 2011a). Longer-term remedial actions to address the historical releases were conducted between 1987 and 2003, resulting in further removal of hydrocarbons from the subsurface (see Section A6).

A5. Remedial Investigations and Monitoring Data

CPL installed 15 monitoring wells between 1983 and 1989 to investigate impacts to groundwater because of historical releases at the Site (Table 1). Groundwater sampling results collected by CPL confirmed petroleum contamination was present, including total petroleum hydrocarbons, gasoline range (TPH-g), diesel range (TPH-d), and oil range (TPH-o); and benzene, ethylbenzene, toluene, and xylene (BTEX) compounds (URS, 2011b). Tidewater installed 20 monitoring wells in 2000 and 2001 to investigate impacts resulting from the pipeline release event discovered in July 2000. Tidewater identified extensive impacts to groundwater near the pipeline release area, consisting primarily of TPH-g and BTEX compounds (URS, 2011b).

Tesoro (i.e., former CPL) and Tidewater monitoring wells located at the upland area of the Site were generally installed at depths between approximately 75 to 100 feet below grade (Table 1). Tesoro well MW-6 is the only remaining well located near the river shoreline and was installed to a depth of 23.5 feet.

Depth to groundwater measurements collected from the monitoring wells between 1986 and 2014 show the historical depth-to-groundwater measured in well MW-2 ranged from 71.70 feet below the top of well casing (TOC) (344.87 feet MSL) in March 1988 to 75.12 feet below TOC (341.45 feet MSL) in September 2002 (URS, 2011b). Historical groundwater level hydrographs show relatively minor groundwater level changes (i.e., less than

approximately 3 feet at well MW-11) at the Site over the period since initial well installation in 1987 (URS, 2011b). The water level in the adjacent Snake River is reportedly maintained between 335 and 340 feet MSL (Ecology, 2012).

Historical and most recent groundwater level data indicate the general direction of groundwater flow is southeast, in the direction toward the Snake River and in the area of the Tesoro wells. Though the historical gradient is essentially flat in the area of the Tidewater wells, the inferred groundwater flow direction based on current and historical conditions is toward the south. Data from the most recent joint monitoring event conducted in May 2014 show the calculated horizontal groundwater gradient varies across the Site, with a nearly flat gradient (i.e., less than 0.0002 feet/feet) in the area of the Tidewater wells and Tesoro wells on the upland bluff above the Snake River. In the area of the Tesoro wells located on the steeply sloping land surface between the upland bluff and the Snake River, the calculated horizontal groundwater gradient is approximately 0.008 feet/feet. These data are generally consistent with historic reports of potentiometric data and interpretations of groundwater flow direction and gradients at the Site (Azure and CH2MHill, 2014).

Geologic cross sections presented in the RI/FS Report were constructed using lithologic data from well borings installed at the Site (URS, 2011b). These data indicate the entire interval of vadose-zone (i.e., depth interval between ground surface and approximately 75 feet below grade) and saturated-zone sediments to a depth of approximately 100 feet is reported to consist of relatively coarse-grained sand and sandy gravel sediments. The relative amount of gravel is reported to generally increase with depth at the Site (URS, 2011b). These data also indicate the aquifer is monitored by the Site wells and is characterized by unconfined conditions.

Groundwater investigations and monitoring to assess the extent and distribution of petroleum impacts to groundwater were conducted on behalf of CPL and Tidewater and are presented in the RI/FS Report (URS, 2011b). Most recent joint groundwater monitoring data were collected on behalf of Tesoro and Tidewater in May 2014 and are presented in the *1st Semi-Annual 2014 Ground-Water Monitoring Report* dated August 20, 2014 (Azure and CH2MHill, 2014). No soil sample or soil laboratory analytical data for the CPL well borings are presented in the RI/FS Report and do not appear to have been collected (URS, 2011b).

Semiannual groundwater monitoring has been conducted by Tesoro since June 2015. Results of remedial investigation and groundwater monitoring completed at the Tesoro Site (i.e., former CPL) through October 2017 (Appendix A, Table A-1) include the following:

- Initial reports of petroleum hydrocarbon impacts included detection of separate-phase hydrocarbons (SPH) at MW-2 and observation of sheen on surface water along the Snake River shoreline in July 1986.
- More than a trace amount of SPH or sheen was reported at one or more of the following wells during the period between 1986 and 2003: MW-2, MW-3, MW-6, MW-7, MW-8, MW-10, MW-11, and MW-12.
- The greatest thickness of SPH measured in a well was approximately four feet recorded at MW-4 in 1991.
- Remedial activities that included soil excavation and groundwater pumping, product removal, and soil vapor extraction (SVE) and air sparge (AS) remedial system operations were completed between January 1987 and July 2000 (see Section A6 below).
- SPH have not been reported at any well since 2003, though trace free product was reported at well MW-3 in June and December 2010.
- The highest historical concentrations of the following hydrocarbon constituents were reported during the period between 1983 to 2017:
    - TPH-g at 48,600 micrograms per liter (µg/L) (MW-3 in March 2000)
    - TPH-d at 1,165,000 µg/L (MW-3 in March 2000)
    - TPH-o at 4,200 µg/l (MW-11 in July 2005)
    - Benzene at 430 µg/L (MW-12 in November 1990)
    - Toluene at 1,050 µg/L (MW-11 in January 1989)
    - Ethylbenzene at 700 µg/L (MW-11 in January 1989)
    - Total xylenes at 2,900 µg/L (MW-11 in February 1991)

Additionally, soil and grab groundwater sampling data were collected by Tesoro in June 2015 to investigate whether Tidewater's TPH-g plume is commingled with Tesoro's plume (primarily TPH-d) in the area peripheral to Tidewater monitoring wells MW-7 and MW-8 (Figure 2).

- June 2015 soil sample data from confirmation borings CB-1 and CB-2 show petroleum hydrocarbons were essentially not reported at concentrations above laboratory reporting limits at both boring locations.
- June 2015 grab groundwater sample data from borings CB-1 and CB-2 show TPH-d (up to 3,100 µg/L) and TPH-o (up to 4,600 µg/L) were reported at both borings.
- June 2015 grab groundwater sample data from borings CB-1 and CB-2 show TPH-g results below laboratory reporting limits (i.e., <250 µg/L) at both borings.

These data confirm the absence of commingling of hydrocarbons between the Tesoro and Tidewater sites, and the lack of a potential source of hydrocarbon release in the general area of the Tesoro site where the borings are located.

A6. Remedial Action Summary

This section provides a summary of past remedial actions.

- Remedial soil excavation and groundwater pumping activities were conducted in May 1987 to remove jet fuel impacted soil and groundwater along the Snake River shoreline area. The excavation and pumping activities were conducted in response to observations of a hydrocarbon sheen on surface water along the Snake River shoreline in July 1986 and subsequent discovery of a leaking underground pipeline located near the area of the sheen. Approximately 1,900 cubic yards of impacted soil were reportedly excavated, and the excavation was backfilled with clean soil. An undisclosed quantity of impacted groundwater was pumped from MW-5. A pumping system, oil/water separator, and water infiltration gallery operated from January to April 1987.
- A product skimmer was installed in MW-2 in December 1987 and was moved to well MW-3 in September 1992. The product skimmer reportedly operated until October 1993 and an undisclosed quantity of product was removed from the wells.
- A groundwater supply well was removed from the Site in May 1989.
- Two separate SVE systems were installed in October 1989 and operated with various well configurations until July 2000. SVE wells included MW-2, MW-3, MW-7, MW-10, MW-11, MW-12 and MW-13. SVE monitoring data show the removal of an estimated 258,000 pounds (41,500 gallons) of petroleum hydrocarbons from vadose-zone soil during the period between October 1989 and approximately February 1993.
- Air sparging was conducted from September 1992 until July 2000 for varying durations at wells MW-2, MW-3, MW-11 and MW-12.

A7. References

Azure and CH2MHill, 2014. *1st Semi-Annual 2014 Ground-Water Monitoring Report*, Tesoro Logistics (former Chevron) Pasco Bulk Terminal, Pasco, Washington. August 20.

Ecology, 2012. *Draft Cleanup Action Plan*, Chevron Pipeline Company Pasco Bulk Terminal. December.

URS, 2011a. *Addendum to the Preliminary Remedial Investigation Report* for the NWTC Pasco Terminal, Pasco, Washington. February 24.

URS, 2011b. *Remedial Investigation/Feasibility Study Report* for the CPL Pasco Terminal, Pasco, Washington. December.

URS, 2012. *Compliance Monitoring Plan* for the NWTC Pasco Terminal, Pasco, Washington. September 29.

Table A1. Historical and Current Groundwater Monitoring and Analytical Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Sample Date	TOC Elevation (feet MSL) (1)	Depth to GW (feet below TOC)	GW Elevation (feet MSL) (1)	Change in GW Elevation (feet)	Total Petroleum Hydrocarbons			VOCs and Lead Scavengers							Fuel Oxgenates						
						TPH-g	TPH-d	TPH-o	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	DIPE	ETBE	MTBE	TBA	TAME	Ethanol	Methanol
Ecology's MTCA Method A Cleanup Levels (for groundwater) *(2)(3)*						800/1,000 [2]	500	500	*5*	*1,000*	*700*	*1,000*	*160*	*0.01*	*5*	*NE*	*NE*	*20*	*NE*	*NE*	*NE*	*NE*
					Units:	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*mg/L*	*mg/L*
Site Monitoring Wells																						
MW-1	Well installed above the groundwater table (always dry); also buried as of December 2017																					
MW-2	12/15/10	417.28	73.21	344.07	--	50 U	**3,100**	**2,400**	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/29/14	417.28	72.83	344.45	-0.38	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	417.28	74.03	343.25	1.20	250 U	250 U	500 U	0.50 U	**0.68**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/4/15	417.28	73.31	343.97	-0.72	250 U	**140**	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	9/28/15	417.28	74.42	342.86	1.11	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/29/16	417.28	74.52	342.76	0.10	50 U	**1,400**	**710**	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	417.28	74.02	343.26	-0.50	50 U	**410**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	5/17/17	417.28	72.86	344.42	-1.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/24/17	417.28	74.12	343.16	1.26	250 U	**580**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/14/18	417.28	72.89	344.39	-1.23	250 U	**450**	**480**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-3	12/14/10	423.42	79.38	344.04	--	NS	NS	NS	NS	NS	NS	NS	--	--	--	--	--	--	--	--	10 U	--
	5/28/14	423.42	78.85	344.57	-0.53	250 U	**1,100**	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/30/14	423.42	80.18	343.24	1.33	**620**	**18,000**	500 U	0.50 U	**1.4**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/4/15	423.42	79.46	343.96	-0.72	250 U	**3,300**	250 U	0.50 U	0.50 U	0.50 U	1.0 U	**0.51**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	**24.8**	**93.2**
	9/29/15	423.42	80.58	342.84	1.12	**733**	**3,300**	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/30/16	423.42	80.60	342.82	0.02	**1,400**	**11,000**	**1,100**	2.0 U	2.0 U	3.0 U	3.0 U	**2.5**	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/6/16	423.42	80.17	343.25	-0.43	**290**	**6,600**	**290**	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5//16/17	423.42	79.04	344.38	-1.13	500 U	**2,600**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/25/17	423.42	80.23	343.19	1.19	**380**	**5,700**	**410**	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/14/18	423.42	79.20	344.22	-1.03	250 U	**4,700**	**860**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-4	12/15/10	412.09	68.43	343.66	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/28/14	412.09	67.98	344.11	-0.45	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/28/14	412.09	69.17	342.92	1.19	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/3/15	412.09	68.48	343.61	-0.69	250 U	100 U	250 U	0.50 U	**0.52**	0.5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	9/28/15	412.09	69.52	342.57	1.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	412.09	69.66	342.43	0.14	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	412.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/15/17	412.09	68.02	344.07	--	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/13/18	412.09	68.15	343.94	0.13	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-5	Well destroyed in May 1987																					
MW-6	12/14/10	358.61	16.34	342.27	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/29/14	358.61	15.57	343.04	-0.77	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	358.61	16.82	341.79	1.25	250 U	250 U	500 U	0.50 U	**4.9**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/3/15	358.61	16.18	342.43	-0.64	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	9/28/15	358.61	17.15	341.46	0.97	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/30/16	358.61	17.15	341.46	0.00	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	358.61	16.91	341.70	-0.24	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5/16/17	358.61	15.88	342.73	-1.03	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/23/17	358.61	17.01	341.60	1.13	250 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/11/18	358.61	15.73	342.88	-1.28	250 U	**180**	**460**	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U

Table A1. Historical and Current Groundwater Monitoring and Analytical Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Sample Date	TOC Elevation (feet MSL) (1)	Depth to GW (feet below TOC)	GW Elevation (feet MSL) (1)	Change in GW Elevation (feet)	Total Petroleum Hydrocarbons			VOCs and Lead Scavengers							Fuel Oxgenates						
						TPH-g	TPH-d	TPH-o	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	DIPE	ETBE	MTBE	TBA	TAME	Ethanol	Methanol
Ecology's MTCA Method A Cleanup Levels (for groundwater) *(2)(3)*						800/1,000 [2]	500	500	*5*	*1,000*	*700*	*1,000*	*160*	*0.01*	*5*	*NE*	*NE*	*20*	*NE*	*NE*	*NE*	*NE*
					Units:	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*mg/L*	*mg/L*
MW-7	12/15/10	411.40	67.37	344.03	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/28/14	411.40	67.02	344.38	-0.35	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	411.40	68.23	343.17	1.21	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/3/15	411.40	67.48	343.92	-0.75	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	9/28/15	411.40	68.61	342.79	1.13	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/30/16	411.40	68.74	342.66	0.13	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	411.40	68.18	343.22	-0.56	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5/15/17	411.40	67.02	344.38	-1.16	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/24/17	411.40	68.22	343.18	1.20	250 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U		6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/13/18	411.40	67.16	344.24	-1.06	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-8	12/15/10	383.91	39.93	343.98	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--		--			--			10 U	--
	5/28/14	383.91	39.56	344.35	-0.37	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	383.91	40.78	343.13	1.22	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/3/15	383.91	40.04	343.87	-0.74	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	**55.6**
	9/28/15	383.91	41.13	342.78	1.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	383.91	40.30	343.61	-0.83	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	383.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/17/17	383.91	39.56	344.35	--	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/11/18	383.91	39.65	344.26	0.090	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-9	Well destroyed in May 1987																					
MW-10	12/15/10	407.91	63.84	344.07	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/28/14	407.91	63.46	344.45	-0.38	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	407.91	64.68	343.23	1.22	250 U	250 U	500 U	0.50 U	**1.1**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/3/15	407.91	63.91	344.00	-0.77	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	**63.7**
	9/28/15	407.91	65.02	342.89	1.11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	407.91	65.22	342.69	0.20	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	407.91	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	5/15/17	407.91	63.50	344.41	--	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/13/18	407.91	63.58	344.33	0.080	250 U	110 U	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-11	12/16/10	423.48	79.46	344.02	--	50 U	**200**	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/29/14	423.48	79.19	344.29	-0.27	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/30/14	423.48	80.31	343.17	1.12	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/4/15	423.48	79.55	343.93	-0.76	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	**52.6**
	9/29/15	423.48	80.67	342.81	1.12	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/29/16	423.48	80.42	343.06	-0.25	50 U	**520**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	423.48	80.29	343.19	-0.13	50 U	**360**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5/16/17	423.48	79.15	344.33	-1.14	500 U	**390**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/25/17	423.48	80.31	343.17	1.16	250 U	**360**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/14/18	423.48	79.30	344.18	-1.01	250 U	**160**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U

Table A1. Historical and Current Groundwater Monitoring and Analytical Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Sample Date	TOC Elevation (feet MSL) (1)	Depth to GW (feet below TOC)	GW Elevation (feet MSL) (1)	Change in GW Elevation (feet)	Total Petroleum Hydrocarbons			VOCs and Lead Scavengers							Fuel Oxgenates						
						TPH-g	TPH-d	TPH-o	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	DIPE	ETBE	MTBE	TBA	TAME	Ethanol	Methanol
Ecology's MTCA Method A Cleanup Levels (for groundwater) *(2)(3)*						800/1,000 [2]	500	500	*5*	*1,000*	*700*	*1,000*	*160*	*0.01*	*5*	*NE*	*NE*	*20*	*NE*	*NE*	*NE*	*NE*
					Units:	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*mg/L*	*mg/L*
MW-12	12/16/10	423.65	79.62	344.03	--	50 U	**490**	**430**	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/29/14	423.65	79.26	344.39	-0.36	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/30/14	423.65	80.45	343.20	1.19	250 U	250 U	500 U	0.50 U	**0.66**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/4/15	423.65	79.72	343.93	-0.73	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	**53.3**
	9/29/15	423.65	80.83	342.82	1.11	250 U	100 U	250 U	0.50 U	0.50 U	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	12/6/16	423.65	80.48	343.17	-0.35	50 U	110 U	250 U	**6.0**	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5/16/17	423.65	79.30	344.35	-1.18	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/24/17	423.65	80.45	343.20	1.15	250 U	**160**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/14/18	423.48	79.30	344.18	-0.98	250 U	**160**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
MW-13	Well installed above the groundwater table (always dry)																					
MW-14	12/15/10	421.97	77.94	344.03	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	5/29/14	421.97	77.58	344.39	-0.36	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	10/29/14	421.97	78.80	343.17	1.22	250 U	250 U	500 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	6/4/15	421.97	78.04	343.93	-0.76	250 U	100 U	250 U	0.50 U	**0.72**	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	50.0 U
	9/28/15	421.97	79.18	342.79	1.14	250 U	100 U	250 U	0.50 U	**0.72**	0.50 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	--	--
	8/29/16	421.97	79.32	342.65	0.14	50 U	**120**	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	12/5/16	421.97	78.75	343.22	-0.57	50 U	110 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	25 U	5.0 U	10 U	10 U
	5/17/17	421.97	77.55	344.42	-1.20	500 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	10/24/17	421.97	78.78	343.19	1.23	250 U	100 U	250 U	2.0 U	2.0 U	3.0 U	3.0 U	2.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
	6/13/18	421.97	77.74	344.23	-1.04	250 U	**110**	350 U	3.0 U	2.0 U	3.0 U	3.0 U	4.0 U	2.0 U	2.0 U	2.0 U	6.0 U	2.0 U	100 U	6.0 U	10 U	10 U
RW-1	12/16/10	417.29	73.28	344.01	--	50 U	120 U	240 U	1.0 U	1.0 U	1.0 U	2.0 U	--	--	--	--	--	--	--	--	10 U	--
	Well buried; status unknown																					

Notes:
Values in **bold** were detected above the limit
= Shaded values exceed Ecology's MTCA Method A Groundwater Cleanup Level.
Analytical results are compared to Ecology's MTCA Method A groundwater cleanup levels.
-- = not sampled; not submitted for this analyte; or not gauged
(1) On July 12, 2018, the wells were resurveyed by Stratton Surveying and Mapping, P.C. The horizontal datum = Washington State Plane South Zone North American Datum 1983(1991). The vertical datum = North American Vertical Datum 29.
(2) Ecology's MTCA Method A Cleanup Levels for Groundwater (Washington Administrative Code 173-340-900 Table 720-1)
(3) Ecology's TPH-g MTCA Method A Cleanup Levels for Groundwater has two levels. If benzene is present in groundwater, the level is 800 ug/L; if no detectable benzene in groundwater, the level is 1,000 ug/L.

Acronyms:
µg/L = microgram per liter
DIPE = di-isopropyl ether
Ecology = Washington State Department of Ecology
EDB = 1,2-Dibromoethane
EDC = 1,2-Dichloroethane
ETBE = ethyl tertiary-butyl ether
GW = groundwater
J = Estimated Concentration
mg/L = milligram per liter
MSL = mean sea level
MTBE = Methyl tertiary-butyl ether
MTCA = Model Toxics Control Act
NA = not analyzed
NE = MTCA Method A screening levels have not been established.
TAME = tertiary-amyl methyl ether
TBA = tertiary-butanol or t-butyl alcohol
TOC = top of casing
TPH = total petroleum hydrocarbon
TPH-g = gasoline range hydrocarbons (as analzyed by Northwest Method NWPTH-Gx)
TPH-d = diesel range hydrocarbons (as analyzed by Northwest Method NWTPH-Dx)
TPH-o = motor oil range hydrocarbons (as analyzed by Northwest Method TPH-Dx)
U = Analyte not detected above limit shown
VOC = Volatile organic compounds

Table A2. Historical and Current Natural Attenuation Parameter Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Date	Field Parameters							Laboratory Analytical			
		pH	Conductivity	Dissolved Oxygen	Temperature	ORP	Ferrous Iron	Nitrate	Sulfate	Alkalinity	Manganese	Methane
Units		S.U.	mS/cm	mg/L	°C	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-2	5/29/14	7.16	1.215	2.49	17.58	146.3	**1.16**	**13.8**	**100**	**537**	0.0050 U	0.001 U
	10/29/14	6.85	1.578	1.07	17.51	91.6	**1.33**	**2.6**	**140**	**730**	**0.011**	0.001 U
	6/4/15	6.84	1.018	2.21	17.97	-66.6	**0.53**	**0.1**	**107**	**558**	0.0050 U	0.001 U
	9/28/15	6.91	1.467	1.77	17.60	-7.0	--	**1.7**	**167**	**711**	0.0050 U	**0.0242**
	8/29/16	7.38	1.40	1.74	19.89	94	--	--	**110**	--	0.02 U	0.0050 U
	12/5/16	6.63	1.05	6.16	15.80	282	--	--	**89**	**400**	--	0.0050 U
	10/24/17	7.34	1.27	8.93	17.58	112.0	0.01 U	**9.70**	**110**	**350**	0.02 U	**0.01**
	6/14/18	6.84	1.16	3.4	22.39	178	**0.96**	**11.0**	**110**	**400**	0.020 U	0.0050 U
MW-3	5/28/14	7.15	1.053	--	18.12	-105.6	--	--	--	--	--	--
	10/30/14	6.91	1.136	0.84	17.28	-144.7	--	--	--	--	--	--
	6/4/15	6.82	1.353	0.95	18.61	-154.0	--	--	--	--	--	--
	9/29/15	6.82	1.174	1.01	17.51	-174.4	--	--	--	--	--	--
	8/30/16	7.13	1.190	2.42	18.13	-153.0	--	--	--	--	--	--
	12/2/16	6.86	0.963	3.24	16.06	36	--	--	--	--	--	--
	5/16/17	7.27	0.996	0.82	17.01	-37	--	--	--	--	--	--
	10/25/17	7.41	1.20	4.01	17.58	-105	--	--	--	--	--	--
	6/14/18	6.70	1.03	2.75	19.46	42	--	--	--	--	--	--
MW-4	5/28/14	7.68	0.728	--	17.78	82.2	--	--	--	--	--	--
	10/28/14	7.38	0.741	7.75	16.90	36.0	--	--	--	--	--	--
	6/3/15	7.40	0.751	8.28	17.76	-23.6	--	--	--	--	--	--
	9/28/15	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	8.36	0.813	7.34	18.32	59	--	--	--	--	--	--
	12/5/16	--	--	--	--	--	--	--	--	--	--	--
	5/15/17	7.99	0.861	7.78	17.9	-27	--	--	--	--	--	--
	6/13/18	7.49	0.813	7.56	20.99	161	--	--	--	--	--	--
MW-6	5/29/14	7.93	0.095	8.78	15.40	127.1	0	**18.5**	**110**	**252**	0.0050 U	0.0010 U
	10/29/14	7.43	0.817	6.79	19.45	84.7	**0.40**	0	**100**	**185**	0.0050 U	0.0010 U
	6/3/15	7.53	0.744	8.59	17.18	-44.8	0	0	**107**	**169**	0.0050 U	**0.00168**
	9/28/15	7.53	0.812	6.76	19.23	-8.5	--	**15.7**	**108**	**189**	0.0050 U	0.0010 U
	8/30/16	8.30	0.836	7.39	18.88	110	--	--	**100**	--	0.020 U	0.0050 U
	12/5/16	6.83	0.851	6.84	14.54	207	--	--	**93**	**170**	0.020 U	0.0050 U
	5/16/17	8.06	0.824	7.89	14.65	66	--	--	**96**	**150**	0.020 U	**0.0085**
	10/23/17	7.61	0.863	9.32	19.68	186	0.01 U	**0.04**	**98**	**180**	0.020 U	0.0050 U
	6/11/18	7.38	0.828	8.38	20.69	156	0.01 U	**8.09**	**96 J**	**150**	0.020 U	0.0050 U
MW-7	5/28/14	7.63	0.775	--	18.48	101.7	--	--	--	--	--	--
	10/29/14	7.48	0.773	7.43	16.81	84.1	--	--	--	--	--	--
	6/3/15	7.10	0.843	6.78	18.03	-1.8	--	--	--	--	--	--
	9/28/15	7.10	0.798	7.40	17.31	-6.4	--	**6.0**	**103**	**203**	**0.0086**	0.0010 U
	8/30/16	7.96	0.964	6.92	19.01	94	--	--	--	--	--	--
	12/5/16	7.06	0.839	7.90	15.85	165	--	--	--	--	--	--
	5/15/17	7.62	0.863	6.10	17.30	35	--	--	--	--	--	--
	10/24/17	7.83	0.918	7.73	17.67	145	--	--	--	--	--	--
	6/13/18	7.25	0.837	6.58	22.15	182	--	--	--	--	--	--

Table A2. Historical and Current Natural Attenuation Parameter Data
Tesoro Pasco Bulk Fuel Terminal
Pasco, Washington

Location	Date	Field Parameters							Laboratory Analytical			
		pH	Conductivity	Dissolved Oxygen	Temperature	ORP	Ferrous Iron	Nitrate	Sulfate	Alkalinity	Manganese	Methane
Units		S.U.	mS/cm	mg/L	°C	mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MW-8	5/28/14	7.70	0.755	--	17.50	89.5	**0.59**	**16.8**	**110**	**242**	0.0050 U	0.0010 U
	10/29/14	7.37	0.774	7.05	17.34	75.3	0	**18.4**	**100**	**190**	0.0072 U	0.0010 U
	6/3/15	7.39	0.778	7.38	17.90	-42.7	0	**16.7**	**108**	**185**	0.0050 U	0.0010 U
	9/28/15	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	7.72	0.843	5.29	19.46	143	--	--	**100**	--	0.020 U	0.0050 U
	12/5/16	--	--	--	--	--	--	--	--	--	--	--
	5/17/17	7.88	0.869	5.68	17.96	28	--	--	**100**	**170**	0.020 U	0.0050 U
	6/11/18	7.28	0.866	7.46	19.77	175	0.01 U	**42.9**	**120**	**180**	0.020 U	0.0050 U
MW-10	5/28/14	7.65	0.764	--	17.91	137.6	--	--	--	--	--	--
	10/29/14	7.40	0.769	7.45	17.02	80.6	--	--	--	--	--	--
	6/3/15	7.29	0.78	7.32	17.90	-34.4	--	--	--	--	--	--
	9/28/15	--	--	--	--	--	--	--	--	--	--	--
	8/30/16	8.28	0.831	5.40	18.26	100	--	--	--	--	--	--
	12/5/16	--	--	--	--	--	--	--	--	--	--	--
	5/15/17	7.39	0.888	6.24	17.41	29	--	--	--	--	--	--
	6/13/18	7.35	0.730	4.96	28.26	178	--	--	--	--	--	--
MW-11	5/29/14	7.20	0.889	1.08	19.27	102.7	--	--	--	--	--	--
	10/30/14	6.96	0.932	1.12	18.47	89.0	--	--	--	--	--	--
	6/4/15	6.89	0.916	0.94	18.97	-49.8	--	--	--	--	--	--
	9/29/15	6.89	0.914	0.89	18.40	-15.4	--	--	--	--	--	--
	8/29/16	7.32	0.952	2.67	19.99	148	--	--	--	--	--	--
	12/5/16	6.70	0.933	1.73	17.14	204	--	--	--	--	--	--
	5/16/17	7.44	0.949	4.79	17.41	46	--	--	--	--	--	--
	10/25/17	7.37	1.040	7.49	18.57	154	--	--	--	--	--	--
	6/14/18	6.71	0.956	3.35	21.77	198	--	--	--	--	--	--
MW-12	5/29/14	7.22	0.993	1.81	19.82	-27.5	--	**9.2**	**110**	**309**	**0.270**	**0.0142**
	10/30/14	6.82	1.135	2.55	16.73	-50.6	**4.68**	0	**110**	**350**	**0.280**	**0.0870**
	6/4/15	6.82	1.017	2.17	18.40	-74.5	**0.34**	**10.4**	**113**	**312**	**0.201**	0.0010 U
	9/29/15	6.82	1.124	1.15	16.49	-63.7	--	**7.0**	**107**	**367**	**0.252**	**0.0362**
	8/29/16	7.45	1.290	1.10	19.42	-10	--	--	**83**	--	**0.25**	**0.760**
	12/6/16	6.80	0.993	3.22	14.52	121	--	--	--	**270**	**0.19**	**0.063**
	5/16/17	7.96	0.965	3.93	15.97	36	--	--	**100**	**240**	**0.16**	**0.012**
	10/24/17	7.50	1.100	3.39	17.70	49	0.01 U	**10.5**	**98.0**	**270**	**0.19**	**0.090**
	6/14/18	6.57	1.12	1.95	18.69	212	0.01 U	**23.8**	**120**	**290**	**0.043**	0.0050 U
MW-14	5/29/14	7.53	0.795	5.70	17.69	101.4	--	--	--	--	--	--
	10/29/14	7.23	0.805	5.65	17.81	105.4	--	--	--	--	--	--
	6/4/15	7.39	0.784	6.22	17.02	-46.6	--	--	--	--	--	--
	8/29/16	7.71	0.877	5.19	18.76	120	--	--	--	--	--	--
	12/5/16	6.97	0.855	6.29	15.43	178	--	--	--	--	--	--
	5/17/17	7.71	0.923	3.02	17.44	46	--	--	--	--	--	--
	10/24/17	7.70	0.932	6.18	17.69	144	--	--	--	--	--	--

Notes:
Values in **bold** were detected above the limit
-- = not sampled or not submitted for this analyte

Acronyms:
°C = degrees celsius
ft = feet
J = estimated concentration
mg/L = milligrams per liter
mS/cm = milliseimens per centimeter
mV = millivolts
ORP = Oxidation Reduction Potential
S.U. = Standard Unit
U = analyte not detected above limit shown

Appendix B
Groundwater Quality Sampling Information Forms

CEECON

WATER QUALITY SAMPLING INFORMATION

Date: 6/14/2018 Well No: MW-2 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 4' Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 72.89 Tubing vol. (Liters) _____
Well screen interval (ft.) 63'-83' Purge Pump: submersible
Well casing depth (ft.) _____ 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 74 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested: _____
No. & types of sample bottles used: VOA's w/HCL x9, w/o x3, Amber 0.25L x2, Plastic 0.250L x3 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
10:32	72.89	0							
	~~71.02~~	0							Start
10:34	73.05	0.5	22.40	7.18	5.78	1.13	178	0.724	No Odor
10:38	73.05	1.0	22.12	6.94	4.65	1.16	186	0.746	Brown Tint
10:42	73.05	1.5	22.56	6.88	3.80	1.15	190	0.739	"
10:46	73.05	2.0	22.49	6.85	3.56	1.15	192	0.739	"
10:49	73.05	2.5	22.39	6.84	3.40	1.16	193	0.742	"
		3.0							
		3.5							
		4.0							
		4.5							
		5.0							
		SAMPLE	Tank	→	10:55 a.m.				
		SAMPLE	Pump	OFF →	11:10 a.m.				
						FG → 0.96			
						N → 11.0			

			SAMPLED	Sample Name: C-MW-2-0618
				Location Name: AO7294- MW-2.

WATER QUALITY SAMPLING INFORMATION

Date: 6/14/2018 Well No: MW-3 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 4" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 79.20 Tubing vol. (Liters) _____
Well screen interval (ft.) 75-95 Purge Pump: submersible
Well casing depth (ft.) 95 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 86 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested: Amaze 0.250 x6, VOA w/HCl x18, 6% x9
No. & types of sample bottles used: _____ Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0			SLIGHT ODOR HxCx, LIGHT BROWN, CLOUDY				
2:30	79.18	0			CLEARER AS PURGING PROGRESSED				Start
2:33	79.20	0.5	18.95	6.83	3.68	1.04	53	0.668	
2:35	79.20	1.0	18.79	6.77	3.20	1.04	53	0.666	
2:38	79.20	1.5	18.79	6.73	3.19	1.04	54	0.663	
2:41	79.22	2.0	18.98	6.71	3.05	1.03	45	0.659	
2:43	79.22	2.5	18.87	6.70	2.94	1.04	42	0.664	
2:45	79.23	3.0	19.10	6.70	2.81	1.04	40	0.664	
2:50	79.23	3.5	19.46	6.70	2.75	1.03	42	0.662	
		4.0							
		4.5							
		5.0							
		Sample Time	→		3:00 p.m.				
		Pump OFF	→		3:22 p.m.				

SAMPLED

Sample Name: C-MW-3-0618
Location Name: AO7294- MW-3.

CEECON

WATER QUALITY SAMPLING INFORMATION

Date: 6/13/2018 Well No: MW-4 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 4" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 68.15 Tubing vol. (Liters) _____
Well screen interval (ft.) 57.77 Purge Pump: submersible
Well casing depth (ft.) 77 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 72 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested:
No. & types of sample bottles used: VOAs w/HCl x6, w/o x3, 250ml Amber x 2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
12:22	68.12	0			Pump	ISSUES ON	FIRST	ATTEMPT	
~~12:28~~	~~68.08~~	0							Start
12:32	68.15	0.5	20.62	7.70	8.29	0.809	138	0.517	CLEAR
12:35	68.15	1.0	20.80	7.61	7.94	0.813	147	0.520	NO ODR
12:38	68.15	1.5	20.04	7.55	7.77	0.811	154	0.519	"
12:40	68.15	2.0	20.92	7.52	7.73	0.806	158	0.516	"
12:42	68.15	2.5	20.78	7.51	7.71	0.808	160	0.517	"
12:44	68.15	3.0	20.99	7.49	7.56	0.813	161	0.520	"
		3.5							
		4.0							
		4.5							
		5.0							
	~~68.08~~	SAMPLE TIME			12:50				
		PUMP OFF			12:55				

			SAMPLED	Sample Name: C-MW-4-0618
				Location Name: AO7294- MW-4.

WATER QUALITY SAMPLING INFORMATION

Date: 6/11/2018 Well No: MW-6 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 15.73 Tubing vol. (Liters) _____
Well screen interval (ft.) 8.5-23.5 Purge Pump: submersible
Well casing depth (ft.) 23.5 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 20 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested: → 250 ml PLASTIC x2
No. & types of sample bottles used: VOAs w/ HCl x9 40ml x3 250ml Amber x2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0							
12:48	15.73	0			Pump ON				Start
12:50	15.75	0.5	20.29	7.49	8.95	0.831	154	0.532	Cloudy/Turbid
12:55	15.77	1.0	20.17	7.43	8.32	0.844	157	0.533	
12:58	15.77	1.5	20.15	7.42	8.64	0.832	155	0.532	
1:01	15.77	2.0	20.43	7.39	8.46	0.828	156	0.530	
1:04	15.77	2.5	20.69	7.38	8.38	0.828	156	0.530	
		3.0							
		3.5							
		4.0							
		4.5							
		5.0							
	Sample 1:15 p.m.								
						Fe → <0.01			
	Pump off 1:24 p.m.					N → 8.09			

			SAMPLED	Sample Name: C-MW-6-0618
				Location Name: AO7294- MW-6.

WATER QUALITY SAMPLING INFORMATION

Date: 6/13/2018 Well No: MW-7 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 67.16 Tubing vol. (Liters) _____
Well screen interval (ft.) 57.77 Purge Pump: submersible
Well casing depth (ft.) 78 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 71 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested:
No. & types of sample bottles used: 6 VOAs w/HCl, 6 w/ 2 x 0.250 Amber Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0							
1:26	67.16	0	[illegible]	[illegible]					Start
1:29	67.16	0.5	24.50	7.35	6.96	0.822	169	0.526	CLEAR/
1:31	67.16	1.0	23.38	7.28	6.56	0.842	176	0.538	ODORLESS
1:33	67.16	1.5	22.57	7.27	6.67	0.844	179	0.541	"
1:34	67.16	2.0	22.15	7.27	6.64	6.841	181	0.538	"
1:36	67.16	2.5	22.15	7.25	6.58	0.837	182	0.535	"
		3.0							
		3.5							
		4.0							
		4.5							
		5.0							
		SAMPLE TIME →		1:40					
		PUMP OFF →		1:50 p.m.					

			SAMPLED	Sample Name: C-MW-7-0618
				Location Name: AO7294- MW-7.

WATER QUALITY SAMPLING INFORMATION

Date: 6/11/2018 Well No: MW-8 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 39.65 Tubing vol. (Liters) _____
Well screen interval (ft.) 29-54 Purge Pump: submersible
Well casing depth (ft.) 54 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 46 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested:
No. & types of sample bottles used: VOAs 0/HCl x9, W/O x3, 250mL Amber x2 → 250mL Plastic x2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0							
2:30	39.65	0			Pump Start		Clear; No Odor		Start
2:32	39.67	0.5	21.26	7.47	8.20	0.866	153	0.555	Clear
2:35	39.67	1.0	20.56	7.39	7.65	0.864	163	0.551	"
2:37	39.67	1.5	20.32	7.35	7.48	0.862	168	0.553	"
2:40	39.67	2.0	20.02	7.31	7.52	0.867	172	0.554	"
2:42	39.67	2.5	19.77	7.29	7.47	0.866	174	0.554	"
2:45	39.67	3.0	19.77	7.28	7.46	0.866	175	0.555	"
		3.5							
		4.0							
		4.5							
		5.0							
	Same	Same							
	Sample Time		2:45 pm			Fe →	<0.01		
	Pump Off		3:02 pm			N →	42.9		

			SAMPLED	Sample Name: C-MW-8-0618
				Location Name: AO7294- MW-8

CEECON

WATER QUALITY SAMPLING INFORMATION

Date: 6/13/2018 Well No: MW-10 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 4" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 63.58 Tubing vol. (Liters) _____
Well screen interval (ft.) 55-78 Purge Pump: submersible
Well casing depth (ft.) 78 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 69 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested:
No. & types of sample bottles used: 6 VOAs w/HCl, 3 x 250 AMBER Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0							
2:15	63.58	0							Start
2:18	63.59	0.5	29.16	7.51	5.32	0.723	162	0.462	CLEAR
2:20	63.60	1.0	28.85	7.46	5.14	0.723	167	0.463	No odor
2:22	63.60	1.5	28.59	7.42	5.02	0.726	172	0.465	"
2:24	63.60	2.0	28.36	7.38	4.93	0.727	176	0.466	"
2:26	63.60	2.5	28.26	7.35	4.96	0.730	178	0.473	"
		3.0							
		3.5							
		4.0							
		4.5							
		5.0							
		SAMPLE TIME		→	2:32				
		PUMP OFF		→	2:38				

			SAMPLED	Sample Name: C-MW-10-0618
				Location Name: AO7294- MW-10.

WATER QUALITY SAMPLING INFORMATION

Date: 6/14/2018 Well No: MW-11 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 79.30 Tubing vol. (Liters) _____
Well screen interval (ft.) 75.85 Purge Pump: submersible
Well casing depth (ft.) 85 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 80 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested: _____
No. & types of sample bottles used: VOAs w/HCl x6, w/o x3, Amber 0.250 x2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0				No odor, clear			
11:55	79.30	0				Slight Brown	Cloudy		Start
11:59	79.43	0.5	23.48	6.75	1.48	1.09	195	0.696	Clear 24
12:01	79.43	1.0	22.45	6.71	1.29	1.09	194	0.700	"
12:03	79.40	1.5	21.99	6.69	1.80	1.06	195	0.679	"
12:08	79.40	2.0	21.61	6.71	2.52	1.02	196	0651	"
12:11	79.40	2.5	21.65	6.72	3.14	0.976	199	0.624	"
12:14	79.40	3.0	21.70	6.71	3.29	0.963	200	0.617	"
12:16	79.40	3.5	21.77	6.71	3.35	0.956	198	0.615	"
		4.0							
		4.5							
		5.0					MW-13	T.D. = 80.65	
						DAMP	Mud on Bottom		
		Sample	Time	→	12:20 p.m.				
		Pump	Off	→	12:25 p.m.				

			SAMPLED	Sample Name: C-MW-11-0618
				Location Name: AO7294- MW-11.

WATER QUALITY SAMPLING INFORMATION

Date: 6/14/2018 Well No: MW-12 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) _____ Tubing length (ft.) _____
Depth to static water (ft.) 79.45 Tubing vol. (Liters) _____
Well screen interval (ft.) 75-85 Purge Pump: submersible
Well casing depth (ft.) 85 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) _____ 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 80 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested: MW-12 - VOAs w/ HCL x9, w/o x3, AMBER 0.250 x2, PLASTIC 0.250 x2
No. & types of sample bottles used: MW-12 DL VOAs w/ HCL x6, w/o x3, AMBER 0.250 x2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0				CLEAR	NO	ODOR, NO	COLOR
1:20	79.45	0							Start
1:23	79.59	0.5	21.67	6.71	2.39	1.14	208	0.728	CLEAR
1:27	79.55	1.0	21.38	6.62	2.06	1.14	209	0.727	"
1:31	79.63	1.5	19.41	6.58	2.02	1.14	211	0.726	"
1:33	79.65	2.0	18.69	6.57	1.95	1.12	212	0.705	"
		2.5							
		3.0							
		3.5							
		4.0				F- → 40.01			
		4.5				N → 23.8			
		5.0							
		Sample Time for MW-12 → 1:40 p.m							
		Sample Time for MW-12D → 1:52 p.m							
		Pump OFF → 1:58 p.m							

			SAMPLED	Sample Name: C-MW-12-0618
				Location Name: AO7294- MW-12

CEECON

WATER QUALITY SAMPLING INFORMATION

Date: 6/13/2018 Well No: MW-14 Sampled by: MH/RS
Project: Tesoro-Pasco Bulk Terminal CEECON Project No: 654.01
Sampling method: low flow

GROUNDWATER

Well diameter (in.) 2" Tubing ID dia. (in.) 3/8"
Well elevation (ft.) Tubing length (ft.)
Depth to static water (ft.) 77.74 Tubing vol. (Liters)
Well screen interval (ft.) 73-83 Purge Pump: submersible
Well casing depth (ft.) 83 2-in. Casing=0.16 gals or 0.61 L/ft.
Water volume in well (gals) 4-in. Casing=0.65 gals or 2.5 L/ft.
Pump/tubing inlet depth (ft) 78 6-in. Casing=1.47 gals or 5.6 L/ft.

Notes:

Tubing vol. (L) = length (ft.) X 0.023

Analyses requested:
No. & types of sample bottles used: VOAs w/HCl x6, w/o x3, Amb 0.25L x 2 Method of shipment: cooler

TIME	DTW (ft)	VOL. PURGED (Liters)	TEMP (°C)	pH ± 0.1	DO (mg/l) ± 10%	SPECIFIC CONDUCTIVITY (uS/cm) ± 3%	ORP (mV) ±10mV	TDS (g/L) ± 10%	CLARITY/ COLOR/ REMARKS
		0							
3:55	77.74	0				Pump ON	SLIGHTLY	CLOUDY	Start
3:57	77.75	0.5	22.06	7.31	5.62	0.892	166	0.570	NO ODOR
3:59	77.75	1.0	21.63	7.23	5.15	0.891	172	0.569	SLIGHT CLOUDY
4:01	77.75	1.5	20.76	7.16	5.13	0.899	180	0.576	" "
4:04	77.75	2.0	20.34	7.10	5.16	0.905	185	0.580	" "
4:06	77.75	2.5	20.22	7.06	5.14	0.908	188	0.581	" "
		3.0							
		3.5							
		4.0							
		4.5							
		5.0							
		Sample	Time		4:12 p.m.				
		Pump	off		4:13 pm				

			SAMPLED	Sample Name: C-MW-14-0618
				Location Name: AO7294- MW-14.

Appendix C
Data Validation Report, Analytical Report, and Chain of Custody Form

AECOM
1111 3rd Ave
Suite 1600
Seattle, WA 98101
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206 438 2700 tel
866 495 5288 fax

Memorandum

To	Nicky Moody, Project Manager	Info	FINAL
Subject	Summary Data Quality Review Tesoro-Pasco June 2018 Groundwater Sampling		
From	Lucy Panteleeff, Chemist Jennifer B. Garner, Chemist		
Date	July 19, 2018		

The summary data quality review of 11 groundwater samples, one equipment blank, and 1 trip blank collected between June 11 and June 14, 2018, has been completed. The samples were analyzed at TestAmerica Laboratories, Incorporated (TA) located in Tacoma, Washington and Nashville, Tennessee, for volatile organic compounds (VOCs) by EPA Method 8260C; total petroleum hydrocarbons (TPHs) by Washington State Department of Ecology (Ecology) Methods NWTPH-Gx (gasoline-range TPH) and NWTPH-Dx (diesel-range and heavy oil-range TPH); alcohols by EPA Method 8015C; methane by EPA Method RSK-175; dissolved manganese by EPA Method 200.7 Revision 4.4; sulfate by EPA Method 300.0, and/or total alkalinity by Standard Methods (SM) 2320B. The laboratory provided a summary report containing sample results and associated quality assurance (QA) and quality control (QC) data for all samples. The following samples are associated with TA laboratory group 580-78110-1:

Sample ID	Laboratory ID	Requested Analyses
C-MW-02	580-78110-1	VOCs, TPH-Gx, TPH-Dx, Alcohols, Methane, Manganese, Sulfate, Alkalinity
C-MW-03	580-78110-2	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-04	580-78110-3	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-06	580-78110-4	VOCs, TPH-Gx, TPH-Dx, Alcohols, Methane, Manganese, Sulfate, Alkalinity
C-MW-07	580-78110-5	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-08	580-78110-6	VOCs, TPH-Gx, TPH-Dx, Alcohols, Methane, Manganese, Sulfate, Alkalinity
C-MW-10	580-78110-7	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-11	580-78110-8	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-12	580-78110-9	VOCs, TPH-Gx, TPH-Dx, Alcohols, Methane, Manganese, Sulfate, Alkalinity
C-MW-12D	580-78110-10	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-MW-14	580-78110-11	VOCs, TPH-Gx, TPH-Dx, Alcohols
C-EB	580-78110-12	VOCs, TPH-Gx, TPH-Dx, Alcohols
Trip Blank	580-78110-13	VOCs, TPH-Gx

Data were evaluated based on validation criteria established in the *National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017, and the *National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017, as applied to the reported methodology.

The following data components were reviewed during the limited data validation procedure for compliance with method specific or laboratory control charted criteria where appropriate: chain of custody forms, holding times, field/method/trip/instrument blanks, surrogate recoveries, matrix

spike/matrix spike duplicate recoveries, laboratory and field duplicate results, laboratory control sample/laboratory control sample duplicate recoveries, reporting limits, and electronic data deliverables.

A summary of qualifiers that may be assigned to results in these laboratory groups are included in Table 1. Qualifiers that may be assigned to results include:

- U - The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
- DNR - Do Not Report. Another result is available that is more reliable or appropriate.

Sample Receipt

Upon receipt by the laboratories, the sample jar information was compared to the chain-of-custody (COC) and the cooler temperatures were recorded. No discrepancies related to sample identifications were noted and the coolers were received at temperatures within the EPA-recommended limits of greater than 0°C and less than or equal to 6°C.

Organic Analyses

Samples were analyzed for VOCs, TPHs, alcohols, and methane by the methods identified in the introduction of this report.

1. Holding Times – Acceptable

2. Blanks – Acceptable

3. Surrogates – Acceptable

4. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable

5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable except as noted below:

   General – MS/MSDs for all organic analyses except methane were performed using C-MW-03. Results were acceptable except as noted below.

VOCs by 8260C – The percent recovery for ethyl-t-butyl ether (ETBE) in the MS (77%) was below the control limits of 79-131%. The percent recovery for ETBE in the MSD and the relative percent difference for the MS/MSD pair were acceptable; therefore, data were not qualified based on this MS result.

Methane by RSK-175 – An MS/MSD was not performed in association with this analysis. Precision and accuracy were assessed using the LCS/LCSD results.

6. Field Duplicate (applicable to VOCs, alcohols, and TPHs only) – Acceptable

General – A field duplicate was submitted for C-MW-12 and identified as C-MW-12D. Results were comparable.

7. Reporting Limits – Acceptable

8. Other Items of Note:

VOCs by EPA Method 8260C – The laboratory noted that the percent difference (%D) for t-butyl alcohol (high) exceeded the method limits of ±20% in the continuing calibration verification (CCV) analyzed on June 21, 2018. t-Butyl alcohol was not detected in the associated samples; therefore, data were not qualified based on this CCV result.

Diesel and Motor Oil-range TPHs by NWTPH-Dx – The laboratory noted that the %Ds for one or more analytes were outside the method limits of ±20% in the following CCVs:

Analytical Batch	Analyte	%D
580-277361	o-Terphenyl (surrogate)	low
	o-Terphenyl (surrogate)	high
	Motor Oil	high
580-277477	o-Terphenyl (surrogate)	low

Data were not qualified based on surrogate %Ds. Motor oil-range TPH was not detected in samples reported in analytical batch 580-277361; therefore, data were not qualified based on this elevated CCV result.

Diesel-range TPH by NWTPH-Dx – The laboratory noted that the diesel chromatographic patterns eluted later than the typical diesel patterns in C-MW-02, C-MW-03, and C-MW-06.

Metals

Samples were analyzed for dissolved manganese by EPA Method 200.7 Rev 4.4.

1. Holding Times – Acceptable

2. Blanks – Acceptable

3. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – Acceptable

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable

   An MS/MSD was performed using C-MW-08. Results were acceptable.

5. Laboratory Duplicates – Acceptable

   A laboratory duplicate was performed using C-MW-08. Results were comparable.

6. Reporting Limits – Acceptable

Conventional Analyses

Samples were analyzed for sulfate and alkalinity by the methods identified in the introduction of this report.

1. Holding Times – Acceptable

2. Blanks – Acceptable where applicable

3. Laboratory Control Sample (LCS) – Acceptable

4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – Acceptable

   Sulfate by EPA Method 300.0 – An MS/MSD was performed using C-MW-06. The percent recoveries for sulfate in the MS (85%) and MSD (85%) were below the control limit of 90-110%. The result for sulfate in C-MW-06 was qualified as estimated and flagged 'J' based on these MS/MSD results.

   Alkalinity by SM2320B – MS/MSDs were not performed in association with this analysis. Precision was assessed using the laboratory duplicate. Accuracy was assessed using the LCS.

5. Laboratory Duplicate – Acceptable

   Sulfate by EPA Method 300.0 – A laboratory duplicate was not performed in association with this analysis. Precision was assessed using the MS/MSD relative percent difference.

   Alkalinity by SM2320B – A laboratory duplicate was performed using C-MW-02. Results were comparable.

6. Reporting Limits – Acceptable

Overall Assessment of Data

The data reported in this laboratory group, as qualified, are considered to be usable for meeting project objectives. The completeness for TestAmerica laboratory group 580-78110-1 is 100%.

QA/QC Data Summary Review
Tesoro-Pasco
June 2018 Groundwater Sampling

Table 1 - Summary of Qualified Data

Sample ID	Laboratory ID	Analyte	Laboratory Result	Units	Final Result
C-MW-06	580-78110-4	Sulfate	96	mg/L	96 J

Notes:
J - estimated value
mg/L - milligram per liter

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-78110-1
Client Project/Site: Tesoro Pasco
Sampling Event: Pasco

For:
AECOM
333 SW 5th Ave, Ste 225
Portland, Oregon 97204

Attn: Nicky Moody

Authorized for release by:
6/29/2018 12:56:24 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-78110-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-78110-1

Comments
No additional comments.

Receipt
The samples were received on 6/15/2018 12:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.1º C, 1.6º C and 3.9º C.

GC/MS VOA
Method(s) 8260C: The continuing calibration verification (CCV) associated with batch 580-276929 recovered above the upper control limit for 2-Methyl-2-propanol. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: C-MW-02 (580-78110-1), C-MW-03 (580-78110-2), C-MW-04 (580-78110-3), C-MW-06 (580-78110-4), C-MW-07 (580-78110-5), C-MW-08 (580-78110-6), C-MW-10 (580-78110-7), C-MW-11 (580-78110-8), C-MW-12 (580-78110-9), C-MW-12D (580-78110-10), C-MW-14 (580-78110-11), C-EB (580-78110-12) and (CCVIS 580-276929/3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method(s) NWTPH-Dx: Continuing calibration verification (CCV) standard associated with batch 580-277361 recovered outside %Drift acceptance criteria for o-Terphenyl surrogate. The %Recovery is within acceptance criteria for the surrogate in the CCV and associated samples; therefore, the data are qualified and reported. C-MW-04 (580-78110-3), C-MW-07 (580-78110-5), C-MW-08 (580-78110-6), C-MW-10 (580-78110-7), C-MW-11 (580-78110-8), C-MW-12 (580-78110-9), C-MW-12D (580-78110-10), C-MW-14 (580-78110-11), C-EB (580-78110-12), (CCV 580-277361/35), (CCV 580-277361/46) and (CCVRT 580-277361/3)

Method(s) NWTPH-Dx: The continuing calibration verification (CCV) associated with batch 580-277361 recovered above the upper control limit for Motor Oil. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: C-MW-04 (580-78110-3), C-MW-07 (580-78110-5), C-MW-08 (580-78110-6), C-MW-10 (580-78110-7), C-MW-11 (580-78110-8), C-MW-12 (580-78110-9), C-MW-12D (580-78110-10), C-MW-14 (580-78110-11), C-EB (580-78110-12), (CCV 580-277361/35) and (CCV 580-277361/46).

Method(s) NWTPH-Dx: The %D of surrogate (o-Terphenyl) for CCVRT and CCV associated with batch 580-277477 was outside the lower control limits. All associated sample surrogate fell within acceptance criteria; therefore, the data have been reported. (CCV 580-277477/14), (CCV 580-277477/25) and (CCVRT 580-277477/3)

Method(s) NWTPH-Dx: The following samples contained a hydrocarbon pattern in the diesel range; however, the elution pattern was later than the typical diesel fuel pattern used by the laboratory for quantitative purposes: C-MW-02 (580-78110-1), C-MW-03 (580-78110-2) and C-MW-06 (580-78110-4).

Method(s) NWTPH-Dx: The following samples and QC were rerun due to CCV failures in the initial analysis. C-MW-02 (580-78110-1), C-MW-03 (580-78110-2), C-MW-03 (580-78110-2[MS]), C-MW-03 (580-78110-2[MSD]), C-MW-06 (580-78110-4), (LCS 580-277260/2-A), (LCSD 580-277260/3-A) and (MB 580-277260/1-A)

Method(s) RSK-175: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 490-523477.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 580-78110-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample ID: C-MW-02

Date Collected: 06/14/18 10:55
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 14:30	1
1,2-DCA	ND		2.0		ug/L			06/21/18 14:30	1
Benzene	ND		3.0		ug/L			06/21/18 14:30	1
DIPE	ND		2.0		ug/L			06/21/18 14:30	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 14:30	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 14:30	1
MTBE	ND		2.0		ug/L			06/21/18 14:30	1
Naphthalene	ND		4.0		ug/L			06/21/18 14:30	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 14:30	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 14:30	1
Toluene	ND		2.0		ug/L			06/21/18 14:30	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 14:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*		*06/21/18 14:30*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 125*		*06/21/18 14:30*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*06/21/18 14:30*	*1*
Toluene-d8 (Surr)	*105*		*80 - 122*		*06/21/18 14:30*	*1*
Trifluorotoluene (Surr)	*100*		*80 - 120*		*06/21/18 14:30*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 09:57	1
Methanol	ND		10		mg/L			06/20/18 09:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*94*		*52 - 128*		*06/20/18 09:57*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 02:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*50 - 150*		*06/16/18 02:29*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*06/16/18 02:29*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/22/18 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*94*		*70 - 130*		*06/22/18 11:08*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.45**		0.11		mg/L		06/25/18 10:32	06/27/18 00:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*94*		*50 - 150*	*06/25/18 10:32*	*06/27/18 00:53*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-02
Date Collected: 06/14/18 10:55
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-1
Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	0.48		0.35		mg/L		06/25/18 10:32	06/27/18 19:20	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.020		mg/L		06/26/18 15:42	06/27/18 14:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	110		2.4		mg/L			06/23/18 11:38	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	400		5.0		mg/L			06/23/18 18:05	1
Bicarbonate Alkalinity as CaCO3	400		5.0		mg/L			06/23/18 18:05	1
Carbonate Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1
Hydroxide Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1

Client Sample ID: C-MW-03
Date Collected: 06/14/18 15:00
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 14:56	1
1,2-DCA	ND		2.0		ug/L			06/21/18 14:56	1
Benzene	ND		3.0		ug/L			06/21/18 14:56	1
DIPE	ND		2.0		ug/L			06/21/18 14:56	1
Ethyl-t-butyl ether (ETBE)	ND	F1	6.0		ug/L			06/21/18 14:56	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 14:56	1
MTBE	ND		2.0		ug/L			06/21/18 14:56	1
Naphthalene	ND		4.0		ug/L			06/21/18 14:56	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 14:56	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 14:56	1
Toluene	ND		2.0		ug/L			06/21/18 14:56	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 126*		*06/21/18 14:56*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 125*		*06/21/18 14:56*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 14:56*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 14:56*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/21/18 14:56*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:03	1
Methanol	ND		10		mg/L			06/20/18 10:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*93*		*52 - 128*		*06/20/18 10:03*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 04:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*50 - 150*		*06/16/18 04:32*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*06/16/18 04:32*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**4.7**		0.11		mg/L		06/25/18 10:32	06/27/18 01:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*108*		*50 - 150*	*06/25/18 10:32*	*06/27/18 01:15*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	**0.86**		0.35		mg/L		06/25/18 10:32	06/27/18 19:42	1

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-04
Date Collected: 06/13/18 12:55
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 16:15	1
1,2-DCA	ND		2.0		ug/L			06/21/18 16:15	1
Benzene	ND		3.0		ug/L			06/21/18 16:15	1
DIPE	ND		2.0		ug/L			06/21/18 16:15	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 16:15	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 16:15	1
MTBE	ND		2.0		ug/L			06/21/18 16:15	1
Naphthalene	ND		4.0		ug/L			06/21/18 16:15	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 16:15	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 16:15	1
Toluene	ND		2.0		ug/L			06/21/18 16:15	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*		*06/21/18 16:15*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 125*		*06/21/18 16:15*	*1*
Dibromofluoromethane (Surr)	*97*		*77 - 120*		*06/21/18 16:15*	*1*
Toluene-d8 (Surr)	*103*		*80 - 122*		*06/21/18 16:15*	*1*
Trifluorotoluene (Surr)	*100*		*80 - 120*		*06/21/18 16:15*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:21	1
Methanol	ND		10		mg/L			06/20/18 10:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*89*		*52 - 128*		*06/20/18 10:21*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 03:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*50 - 150*		*06/16/18 03:00*	*1*
Trifluorotoluene (Surr)	*100*		*50 - 150*		*06/16/18 03:00*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/27/18 02:21	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 02:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*06/25/18 10:32*	*06/27/18 02:21*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-06
Date Collected: 06/11/18 13:15
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 16:41	1
1,2-DCA	ND		2.0		ug/L			06/21/18 16:41	1
Benzene	ND		3.0		ug/L			06/21/18 16:41	1
DIPE	ND		2.0		ug/L			06/21/18 16:41	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 16:41	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 16:41	1
MTBE	ND		2.0		ug/L			06/21/18 16:41	1
Naphthalene	ND		4.0		ug/L			06/21/18 16:41	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 16:41	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 16:41	1
Toluene	ND		2.0		ug/L			06/21/18 16:41	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 126*		*06/21/18 16:41*	*1*
4-Bromofluorobenzene (Surr)	*102*		*80 - 125*		*06/21/18 16:41*	*1*
Dibromofluoromethane (Surr)	*96*		*77 - 120*		*06/21/18 16:41*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 16:41*	*1*
Trifluorotoluene (Surr)	*100*		*80 - 120*		*06/21/18 16:41*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:28	1
Methanol	ND		10		mg/L			06/20/18 10:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*99*		*52 - 128*		*06/20/18 10:28*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 03:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*50 - 150*		*06/16/18 03:31*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*06/16/18 03:31*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/21/18 11:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*101*		*70 - 130*		*06/21/18 11:02*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.18**		0.11		mg/L		06/25/18 10:32	06/27/18 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*100*		*50 - 150*	*06/25/18 10:32*	*06/27/18 03:05*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-06
Date Collected: 06/11/18 13:15
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-4
Matrix: Water

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36)	**0.46**		0.35		mg/L		06/25/18 10:32	06/27/18 20:48	1

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.020		mg/L		06/26/18 15:42	06/27/18 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**96**		1.2		mg/L			06/22/18 23:03	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**150**		5.0		mg/L			06/23/18 18:05	1
Bicarbonate Alkalinity as CaCO3	**150**		5.0		mg/L			06/23/18 18:05	1
Carbonate Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1
Hydroxide Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1

Client Sample ID: C-MW-07
Date Collected: 06/13/18 13:40
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 17:07	1
1,2-DCA	ND		2.0		ug/L			06/21/18 17:07	1
Benzene	ND		3.0		ug/L			06/21/18 17:07	1
DIPE	ND		2.0		ug/L			06/21/18 17:07	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 17:07	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 17:07	1
MTBE	ND		2.0		ug/L			06/21/18 17:07	1
Naphthalene	ND		4.0		ug/L			06/21/18 17:07	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 17:07	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 17:07	1
Toluene	ND		2.0		ug/L			06/21/18 17:07	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 126*		*06/21/18 17:07*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 125*		*06/21/18 17:07*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 17:07*	*1*
Toluene-d8 (Surr)	*102*		*80 - 122*		*06/21/18 17:07*	*1*
Trifluorotoluene (Surr)	*101*		*80 - 120*		*06/21/18 17:07*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:34	1
Methanol	ND		10		mg/L			06/20/18 10:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*90*		*52 - 128*		*06/20/18 10:34*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 04:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*50 - 150*		*06/16/18 04:02*	*1*
Trifluorotoluene (Surr)	*100*		*50 - 150*		*06/16/18 04:02*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/27/18 03:27	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 03:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*102*		*50 - 150*	*06/25/18 10:32*	*06/27/18 03:27*	*1*

Client Sample ID: C-MW-08

Date Collected: 06/11/18 14:55
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-6

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 17:33	1
1,2-DCA	ND		2.0		ug/L			06/21/18 17:33	1
Benzene	ND		3.0		ug/L			06/21/18 17:33	1
DIPE	ND		2.0		ug/L			06/21/18 17:33	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 17:33	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 17:33	1
MTBE	ND		2.0		ug/L			06/21/18 17:33	1
Naphthalene	ND		4.0		ug/L			06/21/18 17:33	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 17:33	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 17:33	1
Toluene	ND		2.0		ug/L			06/21/18 17:33	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 17:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 126*		*06/21/18 17:33*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 125*		*06/21/18 17:33*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 17:33*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 17:33*	*1*
Trifluorotoluene (Surr)	*98*		*80 - 120*		*06/21/18 17:33*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:40	1
Methanol	ND		10		mg/L			06/20/18 10:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*96*		*52 - 128*		*06/20/18 10:40*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*50 - 150*		*06/16/18 17:38*	*1*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*06/16/18 17:38*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/21/18 11:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*97*		*70 - 130*		*06/21/18 11:06*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/27/18 03:49	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 03:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*101*		*50 - 150*	*06/25/18 10:32*	*06/27/18 03:49*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-08
Date Collected: 06/11/18 14:55
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-6
Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.020		mg/L		06/26/18 15:42	06/27/18 13:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**120**		2.4		mg/L			06/23/18 12:13	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**180**		5.0		mg/L			06/23/18 18:05	1
Bicarbonate Alkalinity as CaCO3	**180**		5.0		mg/L			06/23/18 18:05	1
Carbonate Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1
Hydroxide Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1

Client Sample ID: C-MW-10
Date Collected: 06/13/18 14:32
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 18:00	1
1,2-DCA	ND		2.0		ug/L			06/21/18 18:00	1
Benzene	ND		3.0		ug/L			06/21/18 18:00	1
DIPE	ND		2.0		ug/L			06/21/18 18:00	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 18:00	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 18:00	1
MTBE	ND		2.0		ug/L			06/21/18 18:00	1
Naphthalene	ND		4.0		ug/L			06/21/18 18:00	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 18:00	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 18:00	1
Toluene	ND		2.0		ug/L			06/21/18 18:00	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 126*		*06/21/18 18:00*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 125*		*06/21/18 18:00*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*06/21/18 18:00*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 18:00*	*1*
Trifluorotoluene (Surr)	*98*		*80 - 120*		*06/21/18 18:00*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:46	1
Methanol	ND		10		mg/L			06/20/18 10:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*86*		*52 - 128*		*06/20/18 10:46*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 18:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*50 - 150*		*06/16/18 18:09*	*1*
Trifluorotoluene (Surr)	*103*		*50 - 150*		*06/16/18 18:09*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/27/18 04:11	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 04:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*102*		*50 - 150*	*06/25/18 10:32*	*06/27/18 04:11*	*1*

Client Sample ID: C-MW-11
Date Collected: 06/14/18 12:20
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 18:26	1
1,2-DCA	ND		2.0		ug/L			06/21/18 18:26	1
Benzene	ND		3.0		ug/L			06/21/18 18:26	1
DIPE	ND		2.0		ug/L			06/21/18 18:26	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 18:26	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 18:26	1
MTBE	ND		2.0		ug/L			06/21/18 18:26	1
Naphthalene	ND		4.0		ug/L			06/21/18 18:26	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 18:26	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 18:26	1
Toluene	ND		2.0		ug/L			06/21/18 18:26	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 126*		*06/21/18 18:26*	*1*
4-Bromofluorobenzene (Surr)	*102*		*80 - 125*		*06/21/18 18:26*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 18:26*	*1*
Toluene-d8 (Surr)	*105*		*80 - 122*		*06/21/18 18:26*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/21/18 18:26*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:52	1
Methanol	ND		10		mg/L			06/20/18 10:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*88*		*52 - 128*		*06/20/18 10:52*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 18:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*50 - 150*		*06/16/18 18:40*	*1*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*06/16/18 18:40*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.16**		0.11		mg/L		06/25/18 10:32	06/27/18 04:33	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 04:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*103*		*50 - 150*	*06/25/18 10:32*	*06/27/18 04:33*	*1*

Client Sample ID: C-MW-12

Date Collected: 06/14/18 13:40
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-9

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 18:52	1
1,2-DCA	ND		2.0		ug/L			06/21/18 18:52	1
Benzene	ND		3.0		ug/L			06/21/18 18:52	1
DIPE	ND		2.0		ug/L			06/21/18 18:52	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 18:52	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 18:52	1
MTBE	ND		2.0		ug/L			06/21/18 18:52	1
Naphthalene	ND		4.0		ug/L			06/21/18 18:52	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 18:52	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 18:52	1
Toluene	ND		2.0		ug/L			06/21/18 18:52	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 18:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 126*		*06/21/18 18:52*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 125*		*06/21/18 18:52*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 18:52*	*1*
Toluene-d8 (Surr)	*103*		*80 - 122*		*06/21/18 18:52*	*1*
Trifluorotoluene (Surr)	*98*		*80 - 120*		*06/21/18 18:52*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 10:58	1
Methanol	ND		10		mg/L			06/20/18 10:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*88*		*52 - 128*		*06/20/18 10:58*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 19:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*50 - 150*		*06/16/18 19:42*	*1*
Trifluorotoluene (Surr)	*100*		*50 - 150*		*06/16/18 19:42*	*1*

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/22/18 11:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acetylene (Surr)	*96*		*70 - 130*		*06/22/18 11:13*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.19**		0.11		mg/L		06/25/18 10:32	06/27/18 04:55	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 04:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*92*		*50 - 150*	*06/25/18 10:32*	*06/27/18 04:55*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-12
Date Collected: 06/14/18 13:40
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-9
Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	**0.043**		0.020		mg/L		06/26/18 15:42	06/27/18 14:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**120**		2.4		mg/L			06/23/18 12:25	2

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	**290**		5.0		mg/L			06/23/18 18:05	1
Bicarbonate Alkalinity as CaCO3	**290**		5.0		mg/L			06/23/18 18:05	1
Carbonate Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1
Hydroxide Alkalinity as CaCO3	ND		5.0		mg/L			06/23/18 18:05	1

Client Sample ID: C-MW-12D
Date Collected: 06/14/18 13:52
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 19:18	1
1,2-DCA	ND		2.0		ug/L			06/21/18 19:18	1
Benzene	ND		3.0		ug/L			06/21/18 19:18	1
DIPE	ND		2.0		ug/L			06/21/18 19:18	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 19:18	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 19:18	1
MTBE	ND		2.0		ug/L			06/21/18 19:18	1
Naphthalene	ND		4.0		ug/L			06/21/18 19:18	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 19:18	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 19:18	1
Toluene	ND		2.0		ug/L			06/21/18 19:18	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 19:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 126*		*06/21/18 19:18*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 125*		*06/21/18 19:18*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*06/21/18 19:18*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 19:18*	*1*
Trifluorotoluene (Surr)	*97*		*80 - 120*		*06/21/18 19:18*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 11:04	1
Methanol	ND		10		mg/L			06/20/18 11:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*96*		*52 - 128*		*06/20/18 11:04*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 20:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*50 - 150*		*06/16/18 20:12*	*1*
Trifluorotoluene (Surr)	*101*		*50 - 150*		*06/16/18 20:12*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.18**		0.11		mg/L		06/25/18 10:32	06/27/18 05:16	1
Motor Oil (>C24-C36)	ND		0.36		mg/L		06/25/18 10:32	06/27/18 05:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*95*		*50 - 150*	*06/25/18 10:32*	*06/27/18 05:16*	*1*

Client Sample ID: C-MW-14
Date Collected: 06/13/18 16:12
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-11
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 19:44	1
1,2-DCA	ND		2.0		ug/L			06/21/18 19:44	1
Benzene	ND		3.0		ug/L			06/21/18 19:44	1
DIPE	ND		2.0		ug/L			06/21/18 19:44	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 19:44	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 19:44	1
MTBE	ND		2.0		ug/L			06/21/18 19:44	1
Naphthalene	ND		4.0		ug/L			06/21/18 19:44	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 19:44	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 19:44	1
Toluene	ND		2.0		ug/L			06/21/18 19:44	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*80 - 126*		*06/21/18 19:44*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 125*		*06/21/18 19:44*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 19:44*	*1*
Toluene-d8 (Surr)	*104*		*80 - 122*		*06/21/18 19:44*	*1*
Trifluorotoluene (Surr)	*97*		*80 - 120*		*06/21/18 19:44*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 11:10	1
Methanol	ND		10		mg/L			06/20/18 11:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*97*		*52 - 128*		*06/20/18 11:10*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*50 - 150*		*06/16/18 20:44*	*1*
Trifluorotoluene (Surr)	*102*		*50 - 150*		*06/16/18 20:44*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	**0.11**		0.11		mg/L		06/25/18 10:32	06/27/18 05:38	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 05:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*86*		*50 - 150*	*06/25/18 10:32*	*06/27/18 05:38*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-EB

Date Collected: 06/13/18 16:45
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-12

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 20:10	1
1,2-DCA	ND		2.0		ug/L			06/21/18 20:10	1
Benzene	ND		3.0		ug/L			06/21/18 20:10	1
DIPE	ND		2.0		ug/L			06/21/18 20:10	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 20:10	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 20:10	1
MTBE	ND		2.0		ug/L			06/21/18 20:10	1
Naphthalene	ND		4.0		ug/L			06/21/18 20:10	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 20:10	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 20:10	1
Toluene	ND		2.0		ug/L			06/21/18 20:10	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 20:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*80 - 126*		*06/21/18 20:10*	*1*
4-Bromofluorobenzene (Surr)	*102*		*80 - 125*		*06/21/18 20:10*	*1*
Dibromofluoromethane (Surr)	*100*		*77 - 120*		*06/21/18 20:10*	*1*
Toluene-d8 (Surr)	*103*		*80 - 122*		*06/21/18 20:10*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/21/18 20:10*	*1*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 11:16	1
Methanol	ND		10		mg/L			06/20/18 11:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Isopropyl acetate (Surr)	*84*		*52 - 128*		*06/20/18 11:16*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 21:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*50 - 150*		*06/16/18 21:15*	*1*
Trifluorotoluene (Surr)	*100*		*50 - 150*		*06/16/18 21:15*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/27/18 06:00	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		06/25/18 10:32	06/27/18 06:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*97*		*50 - 150*	*06/25/18 10:32*	*06/27/18 06:00*	*1*

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: Trip Blank
Date Collected: 06/11/18 00:01
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-13
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/16/18 16:28	1
1,2-DCA	ND		2.0		ug/L			06/16/18 16:28	1
Benzene	ND		3.0		ug/L			06/16/18 16:28	1
DIPE	ND		2.0		ug/L			06/16/18 16:28	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/16/18 16:28	1
Ethylbenzene	ND		3.0		ug/L			06/16/18 16:28	1
MTBE	ND		2.0		ug/L			06/16/18 16:28	1
Naphthalene	ND		4.0		ug/L			06/16/18 16:28	1
t-Butyl alcohol	ND		100		ug/L			06/16/18 16:28	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/16/18 16:28	1
Toluene	ND		2.0		ug/L			06/16/18 16:28	1
Xylenes, Total	ND		3.0		ug/L			06/16/18 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 126*		*06/16/18 16:28*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 125*		*06/16/18 16:28*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*06/16/18 16:28*	*1*
Toluene-d8 (Surr)	*107*		*80 - 122*		*06/16/18 16:28*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/16/18 16:28*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*50 - 150*		*06/16/18 16:05*	*1*
Trifluorotoluene (Surr)	*93*		*50 - 150*		*06/16/18 16:05*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-276450/5
Matrix: Water
Analysis Batch: 276450

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/16/18 15:15	1
1,2-DCA	ND		2.0		ug/L			06/16/18 15:15	1
Benzene	ND		3.0		ug/L			06/16/18 15:15	1
DIPE	ND		2.0		ug/L			06/16/18 15:15	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/16/18 15:15	1
Ethylbenzene	ND		3.0		ug/L			06/16/18 15:15	1
MTBE	ND		2.0		ug/L			06/16/18 15:15	1
Naphthalene	ND		4.0		ug/L			06/16/18 15:15	1
t-Butyl alcohol	ND		100		ug/L			06/16/18 15:15	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/16/18 15:15	1
Toluene	ND		2.0		ug/L			06/16/18 15:15	1
Xylenes, Total	ND		3.0		ug/L			06/16/18 15:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*		*06/16/18 15:15*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 125*		*06/16/18 15:15*	*1*
Dibromofluoromethane (Surr)	*98*		*77 - 120*		*06/16/18 15:15*	*1*
Toluene-d8 (Surr)	*107*		*80 - 122*		*06/16/18 15:15*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/16/18 15:15*	*1*

Lab Sample ID: LCS 580-276450/6
Matrix: Water
Analysis Batch: 276450

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	10.0	9.60		ug/L		96	79 - 120
1,2-DCA	10.0	9.61		ug/L		96	76 - 131
Benzene	10.0	9.62		ug/L		96	75 - 128
DIPE	12.5	12.4		ug/L		100	71 - 141
Ethyl-t-butyl ether (ETBE)	12.5	11.6		ug/L		93	79 - 131
Ethylbenzene	10.0	9.99		ug/L		100	75 - 120
MTBE	10.0	9.31		ug/L		93	72 - 130
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	75 - 120
Naphthalene	10.0	8.70		ug/L		87	50 - 144
o-Xylene	10.0	10.4		ug/L		104	74 - 120
t-Butyl alcohol	100	96.4	J	ug/L		96	31 - 150
Tert-amyl methyl ether	12.5	12.2		ug/L		97	75 - 133
Toluene	10.0	9.80		ug/L		98	75 - 120
Xylenes, Total	20.0	20.6		ug/L		103	74 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*80 - 126*
4-Bromofluorobenzene (Surr)	*99*		*80 - 125*
Dibromofluoromethane (Surr)	*98*		*77 - 120*
Toluene-d8 (Surr)	*102*		*80 - 122*
Trifluorotoluene (Surr)	*97*		*80 - 120*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-276450/7
Matrix: Water
Analysis Batch: 276450

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	10.0	9.45		ug/L		95	79 - 120	2	26
1,2-DCA	10.0	9.87		ug/L		99	76 - 131	3	11
Benzene	10.0	9.72		ug/L		97	75 - 128	1	14
DIPE	12.5	12.7		ug/L		102	71 - 141	2	11
Ethyl-t-butyl ether (ETBE)	12.5	12.0		ug/L		96	79 - 131	4	17
Ethylbenzene	10.0	10.1		ug/L		101	75 - 120	1	14
MTBE	10.0	9.55		ug/L		96	72 - 130	3	18
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	75 - 120	0	14
Naphthalene	10.0	8.52		ug/L		85	50 - 144	2	16
o-Xylene	10.0	10.5		ug/L		105	74 - 120	1	16
t-Butyl alcohol	100	98.3	J	ug/L		98	31 - 150	2	35
Tert-amyl methyl ether	12.5	12.4		ug/L		99	75 - 133	2	16
Toluene	10.0	9.90		ug/L		99	75 - 120	1	13
Xylenes, Total	20.0	20.7		ug/L		104	74 - 120	0	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*
4-Bromofluorobenzene (Surr)	*98*		*80 - 125*
Dibromofluoromethane (Surr)	*99*		*77 - 120*
Toluene-d8 (Surr)	*101*		*80 - 122*
Trifluorotoluene (Surr)	*99*		*80 - 120*

Lab Sample ID: MB 580-276929/5
Matrix: Water
Analysis Batch: 276929

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane	ND		2.0		ug/L			06/21/18 12:45	1
1,2-DCA	ND		2.0		ug/L			06/21/18 12:45	1
Benzene	ND		3.0		ug/L			06/21/18 12:45	1
DIPE	ND		2.0		ug/L			06/21/18 12:45	1
Ethyl-t-butyl ether (ETBE)	ND		6.0		ug/L			06/21/18 12:45	1
Ethylbenzene	ND		3.0		ug/L			06/21/18 12:45	1
MTBE	ND		2.0		ug/L			06/21/18 12:45	1
Naphthalene	ND		4.0		ug/L			06/21/18 12:45	1
t-Butyl alcohol	ND		100		ug/L			06/21/18 12:45	1
Tert-amyl methyl ether	ND		6.0		ug/L			06/21/18 12:45	1
Toluene	ND		2.0		ug/L			06/21/18 12:45	1
Xylenes, Total	ND		3.0		ug/L			06/21/18 12:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*		*06/21/18 12:45*	*1*
4-Bromofluorobenzene (Surr)	*104*		*80 - 125*		*06/21/18 12:45*	*1*
Dibromofluoromethane (Surr)	*99*		*77 - 120*		*06/21/18 12:45*	*1*
Toluene-d8 (Surr)	*105*		*80 - 122*		*06/21/18 12:45*	*1*
Trifluorotoluene (Surr)	*99*		*80 - 120*		*06/21/18 12:45*	*1*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-276929/6
Matrix: Water
Analysis Batch: 276929

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2-Dibromoethane			10.0	11.2		ug/L		112	79 - 120		
1,2-DCA			10.0	10.9		ug/L		109	76 - 131		
Benzene			10.0	11.3		ug/L		113	75 - 128		
DIPE			12.5	13.9		ug/L		111	71 - 141		
Ethyl-t-butyl ether (ETBE)			12.5	13.5		ug/L		108	79 - 131		
Ethylbenzene			10.0	11.1		ug/L		111	75 - 120		
MTBE			10.0	10.7		ug/L		107	72 - 130		
m-Xylene & p-Xylene			10.0	11.1		ug/L		111	75 - 120		
Naphthalene			10.0	11.2		ug/L		112	50 - 144		
o-Xylene			10.0	11.4		ug/L		114	74 - 120		
t-Butyl alcohol			100	101		ug/L		101	31 - 150		
Tert-amyl methyl ether			12.5	13.6		ug/L		109	75 - 133		
Toluene			10.0	11.2		ug/L		112	75 - 120		
Xylenes, Total			20.0	22.5		ug/L		113	74 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*80 - 126*
4-Bromofluorobenzene (Surr)	*104*		*80 - 125*
Dibromofluoromethane (Surr)	*100*		*77 - 120*
Toluene-d8 (Surr)	*104*		*80 - 122*
Trifluorotoluene (Surr)	*98*		*80 - 120*

Lab Sample ID: LCSD 580-276929/7
Matrix: Water
Analysis Batch: 276929

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane			10.0	10.8		ug/L		108	79 - 120	4	26
1,2-DCA			10.0	10.2		ug/L		102	76 - 131	6	11
Benzene			10.0	10.1		ug/L		101	75 - 128	11	14
DIPE			12.5	12.8		ug/L		102	71 - 141	8	11
Ethyl-t-butyl ether (ETBE)			12.5	12.6		ug/L		101	79 - 131	7	17
Ethylbenzene			10.0	10.5		ug/L		105	75 - 120	5	14
MTBE			10.0	10.1		ug/L		101	72 - 130	6	18
m-Xylene & p-Xylene			10.0	10.5		ug/L		105	75 - 120	6	14
Naphthalene			10.0	10.7		ug/L		107	50 - 144	5	16
o-Xylene			10.0	10.4		ug/L		104	74 - 120	9	16
t-Butyl alcohol			100	117		ug/L		117	31 - 150	15	35
Tert-amyl methyl ether			12.5	12.5		ug/L		100	75 - 133	8	16
Toluene			10.0	10.6		ug/L		106	75 - 120	6	13
Xylenes, Total			20.0	20.9		ug/L		105	74 - 120	7	15

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*
4-Bromofluorobenzene (Surr)	*105*		*80 - 125*
Dibromofluoromethane (Surr)	*99*		*77 - 120*
Toluene-d8 (Surr)	*104*		*80 - 122*

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-276929/7
Matrix: Water
Analysis Batch: 276929

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Trifluorotoluene (Surr)	*101*		*80 - 120*

Lab Sample ID: 580-78110-2 MS
Matrix: Water
Analysis Batch: 276929

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane	ND		11.6	9.81		ug/L		84	79 - 120
1,2-DCA	ND		11.6	9.38		ug/L		81	76 - 131
Benzene	ND		11.6	9.64		ug/L		83	75 - 128
DIPE	ND		14.5	11.7		ug/L		80	71 - 141
Ethyl-t-butyl ether (ETBE)	ND	F1	14.5	11.2	F1	ug/L		77	79 - 131
Ethylbenzene	ND		11.6	9.52		ug/L		82	75 - 120
MTBE	ND		11.6	9.11		ug/L		78	72 - 130
m-Xylene & p-Xylene	ND		11.6	9.60		ug/L		83	75 - 120
Naphthalene	ND		11.6	9.83		ug/L		85	50 - 144
o-Xylene	ND		11.6	9.34		ug/L		80	74 - 120
t-Butyl alcohol	ND		116	101		ug/L		87	31 - 150
Tert-amyl methyl ether	ND		14.5	11.2		ug/L		77	75 - 133
Toluene	ND		11.6	9.94		ug/L		85	75 - 120
Xylenes, Total	ND		23.3	18.9		ug/L		81	74 - 120

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*
4-Bromofluorobenzene (Surr)	*103*		*80 - 125*
Dibromofluoromethane (Surr)	*98*		*77 - 120*
Toluene-d8 (Surr)	*103*		*80 - 122*
Trifluorotoluene (Surr)	*98*		*80 - 120*

Lab Sample ID: 580-78110-2 MSD
Matrix: Water
Analysis Batch: 276929

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	ND		11.6	12.5		ug/L		108	79 - 120	24	35
1,2-DCA	ND		11.6	12.2		ug/L		105	76 - 131	26	35
Benzene	ND		11.6	12.3		ug/L		106	75 - 128	24	35
DIPE	ND		14.5	15.3		ug/L		106	71 - 141	27	35
Ethyl-t-butyl ether (ETBE)	ND	F1	14.5	14.7		ug/L		101	79 - 131	27	35
Ethylbenzene	ND		11.6	12.5		ug/L		107	75 - 120	27	35
MTBE	ND		11.6	11.8		ug/L		102	72 - 130	26	35
m-Xylene & p-Xylene	ND		11.6	12.5		ug/L		108	75 - 120	26	35
Naphthalene	ND		11.6	12.9		ug/L		111	50 - 144	27	35
o-Xylene	ND		11.6	12.3		ug/L		105	74 - 120	27	35
t-Butyl alcohol	ND		116	134		ug/L		116	31 - 150	29	35
Tert-amyl methyl ether	ND		14.5	14.7		ug/L		101	75 - 133	27	35
Toluene	ND		11.6	12.9		ug/L		111	75 - 120	26	35
Xylenes, Total	ND		23.3	24.8		ug/L		107	74 - 120	27	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 126*
4-Bromofluorobenzene (Surr)	*102*		*80 - 125*
Dibromofluoromethane (Surr)	*98*		*77 - 120*
Toluene-d8 (Surr)	*104*		*80 - 122*
Trifluorotoluene (Surr)	*100*		*80 - 120*

Method: 8015C - Nonhalogenated Organic using GC/FID (Direct Aqueous Injection)

Lab Sample ID: MB 490-523161/4
Matrix: Water
Analysis Batch: 523161

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ethanol	ND		10		mg/L			06/20/18 09:04	1
Methanol	ND		10		mg/L			06/20/18 09:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Isopropyl acetate (Surr)	*100*		*52 - 128*		*06/20/18 09:04*	*1*

Lab Sample ID: LCS 490-523161/5
Matrix: Water
Analysis Batch: 523161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol	50.2	63.7		mg/L		127	70 - 130
Methanol	50.2	63.6		mg/L		127	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Isopropyl acetate (Surr)	*102*		*52 - 128*

Lab Sample ID: 580-78110-2 MS
Matrix: Water
Analysis Batch: 523161

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ethanol	ND		50.2	64.4		mg/L		128	65 - 130
Methanol	ND		50.2	64.4		mg/L		128	64 - 138

Surrogate	MS %Recovery	MS Qualifier	Limits
Isopropyl acetate (Surr)	*100*		*52 - 128*

Lab Sample ID: 580-78110-2 MSD
Matrix: Water
Analysis Batch: 523161

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethanol	ND		50.2	60.7		mg/L		121	65 - 130	6	11
Methanol	ND		50.2	60.2		mg/L		120	64 - 138	7	21

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Isopropyl acetate (Surr)	*79*		*52 - 128*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-276431/6
Matrix: Water
Analysis Batch: 276431

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/15/18 16:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*50 - 150*		*06/15/18 16:09*	*1*
Trifluorotoluene (Surr)	*92*		*50 - 150*		*06/15/18 16:09*	*1*

Lab Sample ID: LCS 580-276431/7
Matrix: Water
Analysis Batch: 276431

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1.00	0.884		mg/L		88	79 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*108*		*50 - 150*
Trifluorotoluene (Surr)	*97*		*50 - 150*

Lab Sample ID: LCSD 580-276431/8
Matrix: Water
Analysis Batch: 276431

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1.00	0.928		mg/L		93	79 - 120	5	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*50 - 150*
Trifluorotoluene (Surr)	*101*		*50 - 150*

Lab Sample ID: 580-78110-2 MS
Matrix: Water
Analysis Batch: 276431

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline	ND		1.00	0.967		mg/L		97	79 - 120		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*50 - 150*
Trifluorotoluene (Surr)	*101*		*50 - 150*

Lab Sample ID: 580-78110-2 MSD
Matrix: Water
Analysis Batch: 276431

Client Sample ID: C-MW-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	ND		1.00	1.04		mg/L		104	79 - 120	8	10

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: 580-78110-2 MSD
Matrix: Water
Analysis Batch: 276431

Client Sample ID: C-MW-03
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*50 - 150*
Trifluorotoluene (Surr)	*101*		*50 - 150*

Lab Sample ID: MB 580-276481/6
Matrix: Water
Analysis Batch: 276481

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.25		mg/L			06/16/18 14:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*50 - 150*		*06/16/18 14:32*	*1*
Trifluorotoluene (Surr)	*108*		*50 - 150*		*06/16/18 14:32*	*1*

Lab Sample ID: LCS 580-276481/7
Matrix: Water
Analysis Batch: 276481

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline			1.00	0.910		mg/L		91	79 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*118*		*50 - 150*
Trifluorotoluene (Surr)	*104*		*50 - 150*

Lab Sample ID: LCSD 580-276481/8
Matrix: Water
Analysis Batch: 276481

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1.00	0.945		mg/L		94	79 - 120	4	10

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*50 - 150*
Trifluorotoluene (Surr)	*106*		*50 - 150*

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 490-523477/5
Matrix: Water
Analysis Batch: 523477

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/21/18 09:23	1

Method: RSK-175 - Dissolved Gases (GC) (Continued)

Lab Sample ID: MB 490-523477/5
Matrix: Water
Analysis Batch: 523477

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	92		70 - 130		06/21/18 09:23	1

Lab Sample ID: LCS 490-523477/6
Matrix: Water
Analysis Batch: 523477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			0.287	0.267		mg/L		93	85 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Acetylene (Surr)	93		70 - 130

Lab Sample ID: LCSD 490-523477/7
Matrix: Water
Analysis Batch: 523477

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methane			0.287	0.262		mg/L		91	85 - 115	2	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Acetylene (Surr)	91		70 - 130

Lab Sample ID: MB 490-523775/5
Matrix: Water
Analysis Batch: 523775

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methane	ND		0.0050		mg/L			06/22/18 09:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acetylene (Surr)	93		70 - 130		06/22/18 09:32	1

Lab Sample ID: LCS 490-523775/6
Matrix: Water
Analysis Batch: 523775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methane			0.287	0.269		mg/L		94	85 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Acetylene (Surr)	93		70 - 130

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 580-277260/1-A
Matrix: Water
Analysis Batch: 277361

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 277260

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		06/25/18 10:32	06/26/18 23:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*100*		*50 - 150*	*06/25/18 10:32*	*06/26/18 23:03*	*1*

Lab Sample ID: LCS 580-277260/2-A
Matrix: Water
Analysis Batch: 277361

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 277260

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)			2.00	1.76		mg/L		88	50 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*99*		*50 - 150*

Lab Sample ID: LCSD 580-277260/3-A
Matrix: Water
Analysis Batch: 277361

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 277260

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)			2.00	1.77		mg/L		89	50 - 120	1	26

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*108*		*50 - 150*

Lab Sample ID: 580-78110-2 MS
Matrix: Water
Analysis Batch: 277361

Client Sample ID: C-MW-03
Prep Type: Total/NA
Prep Batch: 277260

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
#2 Diesel (C10-C24)	4.7		2.03	6.51		mg/L		89	50 - 120		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o-Terphenyl	*97*		*50 - 150*

Lab Sample ID: 580-78110-2 MSD
Matrix: Water
Analysis Batch: 277361

Client Sample ID: C-MW-03
Prep Type: Total/NA
Prep Batch: 277260

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
#2 Diesel (C10-C24)	4.7		2.02	6.35		mg/L		81	50 - 120	2	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
o-Terphenyl	*102*		*50 - 150*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) - RA

Lab Sample ID: MB 580-277260/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277477 — **Prep Batch: 277260**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Motor Oil (>C24-C36) - RA	ND		0.35		mg/L		06/25/18 10:32	06/27/18 17:31	1

Lab Sample ID: LCS 580-277260/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277477 — **Prep Batch: 277260**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Motor Oil (>C24-C36) - RA	2.00	1.99		mg/L		100	64 - 120

Lab Sample ID: LCSD 580-277260/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277477 — **Prep Batch: 277260**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Motor Oil (>C24-C36) - RA	2.00	2.00		mg/L		100	64 - 120	0	24

Lab Sample ID: 580-78110-2 MS — **Client Sample ID: C-MW-03**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277477 — **Prep Batch: 277260**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Motor Oil (>C24-C36) - RA	0.86		2.03	2.61		mg/L		86	64 - 120

Lab Sample ID: 580-78110-2 MSD — **Client Sample ID: C-MW-03**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277477 — **Prep Batch: 277260**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Motor Oil (>C24-C36) - RA	0.86		2.02	2.63		mg/L		87	64 - 120	1	24

Method: 200.7 Rev 4.4 - Metals (ICP)

Lab Sample ID: LCS 580-277439/10-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277623 — **Prep Batch: 277439**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	0.100	0.0964		mg/L		96	85 - 115

Lab Sample ID: LCSD 580-277439/11-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 277623 — **Prep Batch: 277439**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Manganese	0.100	0.0967		mg/L		97	85 - 115	0	20

Method: 200.7 Rev 4.4 - Metals (ICP) (Continued)

Lab Sample ID: MB 580-277297/5-B
Matrix: Water
Analysis Batch: 277623

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 277439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.020		mg/L		06/26/18 15:42	06/27/18 13:43	1

Lab Sample ID: 580-78110-6 MS
Matrix: Water
Analysis Batch: 277623

Client Sample ID: C-MW-08
Prep Type: Dissolved
Prep Batch: 277439

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	ND		0.100	0.0932		mg/L		93	70 - 130

Lab Sample ID: 580-78110-6 MSD
Matrix: Water
Analysis Batch: 277623

Client Sample ID: C-MW-08
Prep Type: Dissolved
Prep Batch: 277439

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Manganese	ND		0.100	0.0925		mg/L		93	70 - 130	1	20

Lab Sample ID: 580-78110-6 DU
Matrix: Water
Analysis Batch: 277623

Client Sample ID: C-MW-08
Prep Type: Dissolved
Prep Batch: 277439

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Manganese	ND		ND		mg/L		NC	20

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 580-277166/3
Matrix: Water
Analysis Batch: 277166

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		1.2		mg/L			06/22/18 17:47	1

Lab Sample ID: LCS 580-277166/4
Matrix: Water
Analysis Batch: 277166

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	50.0	50.9		mg/L		102	90 - 110

Lab Sample ID: 580-78110-4 MS
Matrix: Water
Analysis Batch: 277215

Client Sample ID: C-MW-06
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	96		50.0	139	F1	mg/L		85	90 - 110

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 580-78110-4 MSD
Matrix: Water
Analysis Batch: 277215

Client Sample ID: C-MW-06
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	96		50.0	138	F1	mg/L		85	90 - 110	0	15

Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 580-277222/2
Matrix: Water
Analysis Batch: 277222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	100	104		mg/L		104	85 - 115

Lab Sample ID: 580-78110-1 DU
Matrix: Water
Analysis Batch: 277222

Client Sample ID: C-MW-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	400		409		mg/L		2	17
Bicarbonate Alkalinity as CaCO3	400		409		mg/L		2	20
Carbonate Alkalinity as CaCO3	ND		ND		mg/L		NC	20
Hydroxide Alkalinity as CaCO3	ND		ND		mg/L		NC	20

Lab Chronicle

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-02

Lab Sample ID: 580-78110-1

Date Collected: 06/14/18 10:55

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 14:30	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 09:57	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276431	06/16/18 02:29	JCV	TAL SEA
Total/NA	Analysis	RSK-175		1	523775	06/22/18 11:08	AAB	TAL NSH
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 00:53	AEK	TAL SEA
Total/NA	Prep	3510C	RA		277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx	RA	1	277477	06/27/18 19:20	CJ	TAL SEA
Dissolved	Filtration	FILTRATION			277297	06/25/18 14:19	CJB	TAL SEA
Dissolved	Prep	200.7			277439	06/26/18 15:42	CJB	TAL SEA
Dissolved	Analysis	200.7 Rev 4.4		1	277623	06/27/18 14:19	HJM	TAL SEA
Total/NA	Analysis	300.0		2	277215	06/23/18 11:38	EMM	TAL SEA
Total/NA	Analysis	SM 2320B		1	277222	06/23/18 18:05	EMM	TAL SEA

Client Sample ID: C-MW-03

Lab Sample ID: 580-78110-2

Date Collected: 06/14/18 15:00

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 14:56	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:03	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276431	06/16/18 04:32	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 01:15	AEK	TAL SEA
Total/NA	Prep	3510C	RA		277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx	RA	1	277477	06/27/18 19:42	CJ	TAL SEA

Client Sample ID: C-MW-04

Lab Sample ID: 580-78110-3

Date Collected: 06/13/18 12:55

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 16:15	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:21	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276431	06/16/18 03:00	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 02:21	AEK	TAL SEA

Client Sample ID: C-MW-06

Lab Sample ID: 580-78110-4

Date Collected: 06/11/18 13:15

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 16:41	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:28	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276431	06/16/18 03:31	JCV	TAL SEA
Total/NA	Analysis	RSK-175		1	523477	06/21/18 11:02	AAB	TAL NSH
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 03:05	AEK	TAL SEA
Total/NA	Prep	3510C	RA		277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx	RA	1	277477	06/27/18 20:48	CJ	TAL SEA
Dissolved	Filtration	FILTRATION			277297	06/25/18 14:19	CJB	TAL SEA
Dissolved	Prep	200.7			277439	06/26/18 15:42	CJB	TAL SEA
Dissolved	Analysis	200.7 Rev 4.4		1	277623	06/27/18 14:22	HJM	TAL SEA
Total/NA	Analysis	300.0		1	277166	06/22/18 23:03	EMM	TAL SEA
Total/NA	Analysis	SM 2320B		1	277222	06/23/18 18:05	EMM	TAL SEA

Client Sample ID: C-MW-07

Lab Sample ID: 580-78110-5

Date Collected: 06/13/18 13:40

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 17:07	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:34	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276431	06/16/18 04:02	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 03:27	AEK	TAL SEA

Client Sample ID: C-MW-08

Lab Sample ID: 580-78110-6

Date Collected: 06/11/18 14:55

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 17:33	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:40	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 17:38	JCV	TAL SEA
Total/NA	Analysis	RSK-175		1	523477	06/21/18 11:06	AAB	TAL NSH
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 03:49	AEK	TAL SEA
Dissolved	Filtration	FILTRATION			277297	06/25/18 14:19	CJB	TAL SEA
Dissolved	Prep	200.7			277439	06/26/18 15:42	CJB	TAL SEA
Dissolved	Analysis	200.7 Rev 4.4		1	277623	06/27/18 13:53	HJM	TAL SEA
Total/NA	Analysis	300.0		2	277215	06/23/18 12:13	EMM	TAL SEA
Total/NA	Analysis	SM 2320B		1	277222	06/23/18 18:05	EMM	TAL SEA

Lab Chronicle

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Client Sample ID: C-MW-10
Date Collected: 06/13/18 14:32
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 18:00	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:46	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 18:09	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 04:11	AEK	TAL SEA

Client Sample ID: C-MW-11
Date Collected: 06/14/18 12:20
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 18:26	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:52	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 18:40	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 04:33	AEK	TAL SEA

Client Sample ID: C-MW-12
Date Collected: 06/14/18 13:40
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 18:52	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 10:58	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 19:42	JCV	TAL SEA
Total/NA	Analysis	RSK-175		1	523775	06/22/18 11:13	AAB	TAL NSH
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 04:55	AEK	TAL SEA
Dissolved	Filtration	FILTRATION			277297	06/25/18 14:19	CJB	TAL SEA
Dissolved	Prep	200.7			277439	06/26/18 15:42	CJB	TAL SEA
Dissolved	Analysis	200.7 Rev 4.4		1	277623	06/27/18 14:25	HJM	TAL SEA
Total/NA	Analysis	300.0		2	277215	06/23/18 12:25	EMM	TAL SEA
Total/NA	Analysis	SM 2320B		1	277222	06/23/18 18:05	EMM	TAL SEA

Client Sample ID: C-MW-12D
Date Collected: 06/14/18 13:52
Date Received: 06/15/18 12:15

Lab Sample ID: 580-78110-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 19:18	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 11:04	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 20:12	JCV	TAL SEA

Lab Chronicle

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 05:16	AEK	TAL SEA

Client Sample ID: C-MW-14

Lab Sample ID: 580-78110-11

Date Collected: 06/13/18 16:12

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 19:44	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 11:10	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 20:44	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 05:38	AEK	TAL SEA

Client Sample ID: C-EB

Lab Sample ID: 580-78110-12

Date Collected: 06/13/18 16:45

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276929	06/21/18 20:10	TL1	TAL SEA
Total/NA	Analysis	8015C		1	523161	06/20/18 11:16	AAB	TAL NSH
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 21:15	JCV	TAL SEA
Total/NA	Prep	3510C			277260	06/25/18 10:32	SPS	TAL SEA
Total/NA	Analysis	NWTPH-Dx		1	277361	06/27/18 06:00	AEK	TAL SEA

Client Sample ID: Trip Blank

Lab Sample ID: 580-78110-13

Date Collected: 06/11/18 00:01

Matrix: Water

Date Received: 06/15/18 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	276450	06/16/18 16:28	TL1	TAL SEA
Total/NA	Analysis	NWTPH-Gx		1	276481	06/16/18 16:05	JCV	TAL SEA

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8260C		Water	t-Butyl alcohol
8260C		Water	Xylenes, Total
SM 2320B		Water	Hydroxide Alkalinity as CaCO3

Laboratory: TestAmerica Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-19
Alaska (UST)	State Program	10	UST-087	06-30-18 *
Arizona	State Program	9	AZ0473	05-05-19
Arkansas DEQ	State Program	6	88-0737	04-25-19
California	State Program	9	2938	10-31-18
Connecticut	State Program	1	PH-0220	12-31-19
Florida	NELAP	4	E87358	06-30-18 *
Georgia	State Program	4	NA: NELAP & A2LA	12-31-19
Illinois	NELAP	5	200010	12-09-18
Iowa	State Program	7	131	04-01-18 *
Kansas	NELAP	7	E-10229	10-31-18
Kentucky (UST)	State Program	4	19	06-30-18 *
Kentucky (WW)	State Program	4	90038	12-31-18
Louisiana	NELAP	6	30613	06-30-18 *
Maine	State Program	1	TN00032	11-03-19
Maryland	State Program	3	316	03-31-19
Massachusetts	State Program	1	M-TN032	06-30-18 *
Minnesota	NELAP	5	047-999-345	12-31-18
Mississippi	State Program	4	N/A	06-30-19
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-18
New Hampshire	NELAP	1	2963	10-09-18
New Jersey	NELAP	2	TN965	06-30-18 *
New York	NELAP	2	11342	03-31-19
North Carolina (WW/SW)	State Program	4	387	12-31-18
North Dakota	State Program	8	R-146	06-30-18 *
Ohio VAP	State Program	5	CL0033	07-06-19
Oklahoma	State Program	6	9412	08-31-18
Oregon	NELAP	10	TN200001	04-26-19
Pennsylvania	NELAP	3	68-00585	06-30-18 *
Rhode Island	State Program	1	LAO00268	12-30-18
South Carolina	State Program	4	84009 (001)	02-28-18 *
Tennessee	State Program	4	2008	02-23-20
Texas	NELAP	6	T104704077	08-31-18
USDA	Federal		P330-13-00306	12-01-19
Utah	NELAP	8	TN00032	07-31-18
Virginia	NELAP	3	460152	06-14-19
Washington	State Program	10	C789	07-19-18
West Virginia DEP	State Program	3	219	02-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Laboratory: TestAmerica Nashville (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Wisconsin	State Program	5	998020430	08-31-18
Wyoming (UST)	A2LA	8	453.07	12-31-19

Sample Summary

Client: AECOM
Project/Site: Tesoro Pasco

TestAmerica Job ID: 580-78110-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-78110-1	C-MW-02	Water	06/14/18 10:55	06/15/18 12:15
580-78110-2	C-MW-03	Water	06/14/18 15:00	06/15/18 12:15
580-78110-3	C-MW-04	Water	06/13/18 12:55	06/15/18 12:15
580-78110-4	C-MW-06	Water	06/11/18 13:15	06/15/18 12:15
580-78110-5	C-MW-07	Water	06/13/18 13:40	06/15/18 12:15
580-78110-6	C-MW-08	Water	06/11/18 14:55	06/15/18 12:15
580-78110-7	C-MW-10	Water	06/13/18 14:32	06/15/18 12:15
580-78110-8	C-MW-11	Water	06/14/18 12:20	06/15/18 12:15
580-78110-9	C-MW-12	Water	06/14/18 13:40	06/15/18 12:15
580-78110-10	C-MW-12D	Water	06/14/18 13:52	06/15/18 12:15
580-78110-11	C-MW-14	Water	06/13/18 16:12	06/15/18 12:15
580-78110-12	C-EB	Water	06/13/18 16:45	06/15/18 12:15
580-78110-13	Trip Blank	Water	06/11/18 00:01	06/15/18 12:15

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

Loc: 580
78110

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Michael Hodges	Lab PM: Cruz, Sheri L	Carrier Tracking No(s):	COC No: 580-22636-7530.1
Client Contact: Michael Hodges	Phone: (415) 359-6453	E-Mail: sheri.cruz@testamericainc.com		Page: 1 of 2
Company: CEECON Testing, Inc.				Job #:
Address: 434 North Canal Street Suite Six	Due Date Requested:			
City: South San Francisco	TAT Requested (days): STANDARD			
State, Zip: CA, 94080	PO #:			
Phone: 253-896-8708(Tel)	WO #:			
Email: ceecon@msn.com	Project #: 58010386			
Project Name: Tesoro Pasco	SSOW#:			
Site: Washington				

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH-Dx	8015C_DAI - Ethanol, Methanol	8260C, (BTEX,MTBE,DIPE,ETBE,TAME,TBA,1,2-DCA,1,2-EDB, Naphth)	NWTPH_Gx	300.0 Sulfate	200.7_CWA - Diss Manganese(Lab Filter)	RSK_175-Methane	2320B, Alkalinity	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	N	A	A	N	N	A	N		
C-MW-02	6/14/18	10:55am	C	Water			X	X	X	X	X	X	X	X		
C-MW-03	6/14/18	3:00pm	C	Water		X	X	X	X	X						MS/MSD
C-MW-04	6/13/18	12:54pm	C	Water			X	X	X	X						
C-MW-06	6/11/18	1:15pm	C	Water			X	X	X	X	X	X	X	X		
C-MW-07	6/13/18	1:40pm	C	Water			X	X	X	X						
C-MW-08	6/11/18	2:55pm	C	Water			X	X	X	X	X	X	X	X		
C-MW-10	6/13/18	2:32pm	C	Water			X	X	X	X						
C-MW-11	6/14/18	12:20pm	C	Water			X	X	X	X						
C-MW-12	6/14/18	1:40pm	C	Water			X	X	X	X	X	X	X	X		
C-MW-12D	6/14/18	1:52pm	C	Water			X	X	X	X						

580-78110 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Michael Hodges	6/15/18 12:15 p.m	CEECON	B. [illegible]	6/15/18 1215	SEATA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	Lab PM: Cruz, Sheri L	Carrier Tracking No(s):	COC No: 580-22636-7530.2
Client Contact: Michael Hodges	Phone:	E-Mail: sheri.cruz@testamericainc.com		Page: 2 of 2
Company: CEECON Testing, Inc.				Job #:
Address: 434 North Canal Street Suite Six	Due Date Requested:			
City: South San Francisco	TAT Requested (days):			
State, Zip: CA, 94080				
Phone: 253-896-8708(Tel)	PO #:			
Email: ceecon@msn.com	WO #:			
Project Name: Tesoro Pasco	Project #: 58010386			
Site: Washington	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH-Dx	8015C_DAI - Ethanol, Methanol	8260C_(BTEX,MTBE,DIPE,ETBE,TAME,TBA,1,2-DCA,1,2-EDB, Naphth)	NWTPH_Gx	300.0 Sulfate	200.7_CWA - Diss Manganese(Lab Filter)	RSK_175-Methane	2320B, Alkalinity	Total Number of containers	Special Instructions/Note:
	Preservation Code:							A	N	A	A	N	N	A	N		
1	C-MW-14	6/13/18	4:12	C	Water			X	X	X	X						
	C-EB	6/13/18	4:45	C	Water			X	X	X	X						
3	Trip Blank Prep Date →	5/29/18	By FL	C	Water					X	X						

Therm. ID: A2 Cor: 3.9 Unc: 3.8
Cooler Dsc: Lrg Green
Packing: Bubble
Cust. Seal: Yes ____ No X
Wet/Packs/Dry Ice/None
FedEx: ____ UPS: ____ Lab Cour: ____ Other: Cl. do

Therm. ID: A2 Cor: 1.1 Unc: 1.0
Cooler Dsc: Lrg Blue
Packing: Bubble
Cust. Seal: Yes ____ No ____
Wet/Packs/Dry Ice/None
FedEx: ____ UPS: ____ Lab Cour: ____ Other: Cl. do

Therm. ID: A2 Cor: 1.6 Unc: 1.5
Cooler Dsc: Lrg Blue
Packing: Bubble
Cust. Seal: Yes ____ No X
Wet/Packs/Dry Ice/None
FedEx: ____ UPS: ____ Lab Cour: ____ Other: Cl. do

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☑ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☑ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Michael Hodges	6/15/18 12:15pm	CEECON	B. Hall	6/15/18 1215	SEA TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

580-78110 Chain of Custody

Cooler Received/Opened On 06-19-2018 @ 09:45

Time Samples Removed From Cooler 1320 Time Samples Placed In Storage 1358 (2 Hour Window)

1. Tracking # 6119 (last 4 digits, FedEx) Courier: _FedEx_

IR Gun ID 31470368 pH Strip Lot NA Chlorine Strip Lot NA

2. Temperature of rep. sample or temp blank when opened: 3.6 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 (front)

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) KA

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

Larger than this.

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial)

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial)

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial)

I certify that I attached a label with the unique LIMS number to each container (intial)

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 8/23/17

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

Loc: 580 78110

Loc: 580 78110

testAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Cruz, Sheri L		COC No: 580-56389.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: sheri.cruz@testamericainc.com	State of Origin: Washington	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Washington		Job #: 580-78110-1
Address: 2960 Foster Creighton Drive, ,	Due Date Requested: 6/27/2018			
City: Nashville	TAT Requested (days):			
State, Zip: TN, 37204				
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:			
Email:	WO #:			
Project Name: Tesoro Pasco	Project #: 58010386			
Site: Tesoro - Pasco/Burbank	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015C_DAI/ (MOD) Alcohols	RSK_175/ Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
C-MW-02 (580-78110-1)	6/14/18	10:55 Pacific		Water			X	X	6	
C-MW-03 (580-78110-2)	6/14/18	15:00 Pacific		Water			X		3	
C-MW-03 (580-78110-2MS)	6/14/18	15:00 Pacific	MS	Water			X		3	
C-MW-03 (580-78110-2MSD)	6/14/18	15:00 Pacific	MSD	Water			X		3	
C-MW-04 (580-78110-3)	6/13/18	12:55 Pacific		Water			X		3	
C-MW-06 (580-78110-4)	6/11/18	13:15 Pacific		Water			X	X	6	
C-MW-07 (580-78110-5)	6/13/18	13:40 Pacific		Water			X		3	
C-MW-08 (580-78110-6)	6/11/18	14:55 Pacific		Water			X	X	6	
C-MW-10 (580-78110-7)	6/13/18	14:32 Pacific		Water			X		3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Tom Blankenship	Date/Time: 6/18/18	Company TA-Sea	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6-19-18 0945	Company TA-NAS

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:
	Cooler Temperature(s) °C and Other Remarks: 3.6

Ver: 09/20/2016

6/29/2018

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Cruz, Sheri L	Carrier Tracking No(s):	COC No: 580-56389.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: sheri.cruz@testamericainc.com	State of Origin: Washington	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc		Accreditations Required (See note): State Program - Washington		Job #: 580-78110-1
Address: 2960 Foster Creighton Drive, ,	Due Date Requested: 6/27/2018			
City: Nashville	TAT Requested (days):			
State, Zip: TN, 37204				
Phone: 615-726-0177(Tel) 615-726-3404(Fax)	PO #:			
Email:	WO #:			
Project Name: Tesoro Pasco	Project #: 58010386			
Site: Tesoro - Pasco/Burbank	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8015C_DAI/ (MOD) Alcohols	RSK_175/ Methane	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
C-MW-11 (580-78110-8)	6/14/18	12:20 Pacific		Water			X		3	
C-MW-12 (580-78110-9)	6/14/18	13:40 Pacific		Water			X	X	6	
C-MW-12D (580-78110-10)	6/14/18	13:52 Pacific		Water			X		3	
C-MW-14 (580-78110-11)	6/13/18	16:12 Pacific		Water			X		3	
C-EB (580-78110-12)	6/13/18	16:45 Pacific		Water			X		3	

Loc: 580
78110

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Tom Blankenship	6/18/18				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 6-19-18 0945	Company TA-NAS

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.6

Ver: 09/20/2016

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78110-1

Login Number: 78110
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78110-1

Login Number: 78110
List Number: 2
Creator: West, Derrick D

List Source: TestAmerica Nashville
List Creation: 06/19/18 01:52 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-78110-1

Login Number: 78110
List Number: 3
Creator: West, Derrick D

List Source: TestAmerica Nashville
List Creation: 06/19/18 01:57 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 100,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

More information on AECOM and its services can be found at www.aecom.com.

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