

**Chevron Environmental Management
Company**

**2013 First Semi-Annual
Groundwater Monitoring Report**

Former Chevron Bulk Plant No. 1001838
Astoria, Oregon
ECSI No. 1402

August 2013



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**2013 First Semi-Annual
Groundwater Monitoring
Report**

Former Chevron Bulk Plant
No. 1001838
Astoria, Oregon

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List of Acronyms and Units of Measure

µg/L	micrograms per liter
BD	blind duplicate
BTEX	benzene, toluene, ethylbenzene, and total xylenes
bgs	below ground surface
°C	degrees Celsius
Chevron	Chevron Environmental Management Company
DEQ	Oregon Department of Environmental Quality
DO	dissolved oxygen
ECSI	Environmental Cleanup Site Information
mL/min	milliliters per minute
NWTPH	Northwest Total Petroleum Hydrocarbons
NWTPH-Dx	Northwest Total Petroleum Hydrocarbons diesel-range and heavy oil-range
NWTPH-Gx	Northwest Total Petroleum Hydrocarbons gasoline-range
ORP	oxidation/reduction potential
PAH	polynuclear aromatic hydrocarbons
pH	potential of hydrogen
PPE	personal protective equipment
QA/QC	quality assurance/quality control
RBC	risk based concentrations
SIM	selected ion monitoring
Site	Former Chevron Bulk Plant No. 1001838
SLV	screening level values
SOP	standard operating procedures
SPH	separate phase hydrocarbons
TDS	total dissolved solids
TMB	1,2,4-trimethylbenzene
TPH	total petroleum hydrocarbon
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds

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1. Introduction

This 2013 First Semi-Annual Groundwater Monitoring Report has been prepared by ARCADIS on behalf of Chevron Environmental Management Company (Chevron) for Former Chevron Bulk Plant No. 1001838 (Site), located at 10 Fifth Street, Astoria, Oregon. The Site is listed in the Oregon Department of Environmental Quality (DEQ) Environmental Cleanup Site Information (ECSI) database (ECSI ID No.1402). A site location map is provided as Figure 1. This report presents the results of semi-annual groundwater monitoring and sampling, which was conducted March 13 to March 14, 2013.

1.1 Report Organization

This First Semi-Annual 2013 Groundwater Monitoring Report is organized into the following sections:

- Section 1 – Introduction: presents a brief description of the Site, an overview of the hydrogeologic setting, and objectives of the groundwater monitoring program
- Section 2 – Field Activities: summarizes groundwater investigation activities
- Section 3 – Results and Discussion: summarizes observations and findings based on review of groundwater investigation results
- Section 4 – Recommendations: presents recommendations for future actions based on results of quarterly groundwater sampling
- Section 5 – References: provides references used to prepare this Report

1.2 Site Description

The Site consists of two city blocks, bordered to the north by Riverwalk Drive, to the south by Marine Drive (US Highway 30), to the east by Sixth Street, and to the west by Fourth Street (Figure 2). Fifth Street separates the two Site parcels. A warehouse was formerly located east of Fifth Street and a tank yard was previously located west of Fifth Street. The eastern parcel is currently occupied by two facilities: a Chevron-branded service station and a commercial card-lock fueling facility. The western parcel is currently occupied by a two-story office building and a surface parking lot.

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1.3 Hydrogeologic Setting

Surface topography at the Site is generally flat. The Site is paved with asphalt and drainage is directed to street gutters and storm sewer. Soils encountered at the Site generally consist of a heterogeneous mix of silts, sands, silty to sandy gravel, and cobbles.

Historical depths to groundwater have ranged from 0.8 to 13.9 feet below the ground surface (bgs). During the first semi-annual 2013 monitoring event, depths to groundwater ranged from 7.65 to 11.20 feet bgs. Depth to groundwater and groundwater flow direction is influenced by tidal fluctuations in the Columbia River, which is located approximately 20 feet north of the Site.

1.4 Monitoring Program

Groundwater sampling was initiated at the Site in 1989. Sampling frequency varied from quarterly to annually between 1989 and 2005. From 2005 to 2010, groundwater monitoring was completed quarterly. In accordance with the Groundwater Monitoring Optimization Plan (ARCADIS 2010), the frequency of groundwater monitoring for the site was reduced from quarterly to semi-annually after September 2010.

Groundwater monitoring is performed at the Site in order to maintain records of changes of groundwater quality and to verify compliance with applicable regulatory requirements. Groundwater monitoring activities are conducted in accordance with established standard operating procedures (SOP) and applicable State of Oregon guidance.

The groundwater monitoring program consists of water-level elevation monitoring, measuring separate phase hydrocarbon (SPH) thickness and chemical analysis of groundwater samples. Objectives of the groundwater-monitoring program include:

- monitoring groundwater quality for volatile organic compounds (VOC), polynuclear aromatic hydrocarbons (PAH), total petroleum hydrocarbons (TPH), total metals, dissolved metals, methane, and select natural attenuation parameters
- evaluating groundwater quality relative to historical data to identify concentration trends

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2. Field Activities

The first semi-annual groundwater monitoring event was conducted March 13 through 14, 2013. Based on generally stable historical concentrations of constituents of concern, four of the 18 monitoring wells (MW-14, MW-17, MW-21, and MW-23) are no longer included in the sampling program. These four wells were gauged for groundwater elevation measurements. During the second semi-annual groundwater monitoring event, four monitoring wells (DM-4, DM-5, MW-3B and MW-15) were not sampled due to high levels of methane gas detected within the wellhead. Two monitoring wells (MW-18 and MW-24) were not sampled due to presence of a separate phase hydrocarbon (SPH) layer on top of the water table. Three monitoring wells (MW-4B, MW-12, and MW-22) were not sampled due to the presence of sheen. MW-19 was unable to be located and therefore was not sampled. The following wells were sampled during the first semi-annual 2013 event:

- one monitoring well east of the Site (MW-6)
- one monitoring well on the former warehouse parcel (MW-16)
- two monitoring wells along the riverbank area (MW-20 and MW-25)

Monitoring well locations are shown on Figure 2. Groundwater samples are collected and submitted for laboratory analysis from each accessible well that does not contain observed SPH or sheen.

2.1 Depth-to-Water Level and SPH Thickness Measurements

Depth-to-water and SPH thickness in each well was measured using an electronic oil-water interface probe. Depth-to-water measurements were obtained during both high and low tide events. Measurements were read from the north side of the top of the inner well casing and recorded on groundwater sampling logs (Appendix A). Groundwater elevation and SPH thickness data are presented in Table 1.

2.2 Groundwater Sample Collection

Groundwater samples were collected for laboratory analysis from monitoring wells MW-6, MW-16, MW-20, and MW-25, in accordance with the Gettler–Ryan, Inc. Standard Operating Procedure for Groundwater Sampling (Appendix A). Samples were packed on ice and shipped under appropriate chain-of-custody protocols to

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Eurofins Lancaster Laboratories Environmental (formerly Lancaster Laboratories, Inc.) in Lancaster, Pennsylvania. Laboratory analyses included the following:

- BTEX using United States Environmental Protection Agency (USEPA) Method 8260B
- PAH using USEPA Method 8270C selected ion monitoring (SIM)
- gasoline-range TPH (TPH-G) using Northwest Method NWTPH-Gx
- diesel-range TPH (TPH-D) and heavy oil-range TPH (TPH-O) using Northwest Method NWTPH-Dx with silica gel acid cleanup and 10 gram column silica gel acid cleanup
- total and dissolved metals using USEPA 6000/7000 series method
- free carbon dioxide using Method SM20 4500-CO₂
- methane using Method RSK-175 (MW-20 and MW-25 only)

Quality assurance/quality control (QA/QC) procedures included collecting one blind duplicate (BD) sample, as discussed below.

2.3 Quality Assurance/Quality Control Sampling

QA/QC sampling is performed as part of the groundwater monitoring program to confirm the accuracy and repeatability of the laboratory analyses. During the first semi-annual 2013 groundwater monitoring event, one BD sample was collected from monitoring well MW-6 and labeled "DUP". Laboratory analytical results for the BD sample are presented alongside the results for the parent sample in Tables 1 through 4. The relative differences between the BD (DUP) and the parent sample (MW-6) are generally less than 15 percent. Results of the comparison between the BD and the parent sample analytical results indicate that laboratory analytical data are acceptable.

2.4 Investigation Derived Waste Management

Waste generated during the first semi-annual 2013 groundwater monitoring event was handled as follows:

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- Water from monitoring wells and decontamination activities was containerized. At the completion of sampling activities water was disposed of at a Chevron-approved facility, in accordance with applicable regulations.
- General waste, such as disposable sampling supplies and personal protective equipment (PPE), was placed in heavy-weight garbage bags or other appropriate containers and disposed of at a Chevron-approved facility, in accordance with applicable regulations.

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3. Results and Discussion

This section summarizes the results of March 2013 groundwater monitoring activities. Laboratory analytical reports and chain of custody documentation are included in Appendix B.

3.1 Groundwater Elevations and Observed SPH Thickness

Groundwater potentiometric surface maps based on the March 2013 high tide and low tide water level measurements are included as Figure 3 and Figure 4, respectively. Groundwater elevations from the March 2013 event indicated groundwater flow to the north.

Sheen was observed in monitoring wells MW-4B, MW-12, and MW-22 during the first semi-annual 2013 groundwater monitoring event. Measurable thickness of SPH was encountered in monitoring wells MW-18 and MW-24 during low tide, with a thickness of 0.16 and 0.14 feet, respectively. SPH thickness was not measured during high tide.

3.2 Groundwater Analytical Results

A summary of first semi-annual 2013 laboratory analytical results are presented in Tables 1 through 4. Historical groundwater analytical results are presented in Appendix C. Based on the findings of the Beneficial Water Use Survey (SAIC 2006) and the Beneficial Water Use Survey Addendum (SAIC 2007), groundwater analytical results were compared to the following values:

- risk-based concentrations (RBC) for construction and excavation workers exposed to groundwater in an open excavation, which are provided in Appendix A to the DEQ document titled "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites" (DEQ 2003; RBC tables, updated 2012)
- screening level values (SLV) for a Level II Screening Ecological Risk Assessment for aquatic receptors in fresh surface water, which are provided in Table 1 of the DEQ document titled "Guidance for Ecological Risk Assessment: Levels I, II, III, and IV" (DEQ 1998, updated 2001)

Comparisons to these RBC and SLV are included in the results tables and summarized as follows:

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- TPH-G, TPH-D, and TPH-O were not detected at concentrations greater than the applicable RBC. Surface water SLVs have not been established for these constituents.
- BTEX were not detected at concentrations greater than the applicable SLV or RBC in the samples collected during the first semi-annual 2013 sampling event.
- Benzo(a)pyrene was detected above the SLV (0.014 µg/L) in the sample collected from MW-25 at a concentration of 0.017 µg/L. No other PAHs were detected at concentrations greater than the SLV. None of the detected concentrations exceeded the applicable RBC.
- Total barium and dissolved barium were detected at concentrations greater than the surface water SLV (4 µg/L) in the samples collected. Total barium concentrations exceeding the SLV ranged from 75.9 µg/L (MW-6, duplicate sample) to 209 µg/L (MW-20). Detected concentrations did not exceed the applicable RBC.
- Total cadmium and dissolved cadmium were not detected at concentrations greater than the surface water SLV or the RBC in the samples collected.
- Total iron was detected at concentrations greater than the surface water SLV (1,000 µg/L) in each sample collected. Total iron concentrations ranged from 14,900 µg/L (MW-6, duplicate sample) to 97,200 µg/L (MW-20). Dissolved iron was detected at concentrations greater than the surface water SLV in each well sampled. Dissolved iron concentrations ranged from 1,080 µg/L (MW-6) to 36,300 µg/L (MW-25).
- Total and dissolved selenium were not detected above the laboratory detection limit in the samples collected; however, the minimum laboratory detection limit (7.5 µg/L) is higher than the SLV (5 µg/L).
- Total and dissolved silver were not detected at concentrations exceeding the applicable RBC or the surface water SLV in the samples collected; however, the minimum laboratory detection limit (1.2 µg/L) is higher than the SLV (0.12 µg/L).
- Total lead was detected at a concentration greater than the surface water SLV (2.5 µg/L) in samples collected from the four monitoring wells sampled (MW-6, MW-16,

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MW-20, MW-25). Detected concentrations ranged from 3.3 µg/L (MW-25) to 27.5 µg/L (MW-20). Dissolved lead concentrations did not exceed the SLV.

- Total and dissolved mercury were not detected at a concentration greater than the surface water SLV (0.77 µg/L) in the samples collected.
- Carbon dioxide concentrations ranged from 6.9 mg/L (MW-66) to 41.5 mg/L (MW-25).
- Methane concentrations ranged from 1,300 µg/L (MW-25) to 4,700 µg/L (MW-20).

As noted above, concentrations of BTEX, TPH-G, TPH-D, and TPH-O were below SLV and applicable RBC in each sample collected. Overall, results of the 2013 first semi-annual groundwater monitoring event are generally consistent with the results of previous monitoring events.

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4. Recommendations

Based on the results of the 2013 first semi-annual groundwater monitoring event, semi-annual monitoring will continue in accordance with the DEQ approved Groundwater Monitoring Optimization Plan (ARCADIS 2010).

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5. References

ARCADIS. *Groundwater Monitoring Program Optimization Work Plan*. Former Chevron Bulk Plant No. 1001838. March 2010.

Oregon Department of Environmental Quality. *Guidance for Ecological Risk Assessment: Levels I, II, III, and IV*. Prepared April 1998, last updated December 2001.

Oregon Department of Environmental Quality. *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites*. September 22, 2003. Updated November 22, 2011.

Science Applications International Corporation. *Beneficial Water Use Survey Report*. March 24, 2006.

Science Applications International Corporation. *Addendum – Beneficial Water Use Survey Report*. August 2, 2007.

ARCADIS

Tables

Table 1
Groundwater Monitoring Data and Analytical Results - TPH, BTEX, and MTBE
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Well ID	Sample Date	TOC* (ft)	DTW (ft)	SPH Thickness (ft)	GWE** (ft)	TPH-G (µg/L)	TPH-D (µg/L)	TPH-D ¹ (µg/L)	TPH-O (µg/L)	TPH-O ¹ (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
DM-4	3/13/2013	14.61	--	--	--	--	--	--	--	--	--	--	--	--	--
DM-5	3/13/2013	13.86	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-3B	3/13/2013	13.78	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-4B	3/13/2013	14.49	9.18	Sheen	5.31	--	--	--	--	--	--	--	--	--	--
MW-6	3/14/2013	13.72	9.25	--	4.47	<50	<30	<30	100	<71	<0.5	<0.5	<0.5	<0.5	--
MW-6 (D)	3/14/2013	--	--	--	--	<50	<29	<29	120	<69	<0.5	<0.5	<0.5	<0.5	--
MW-12	3/13/2013	13.19	7.83	Sheen	5.36	--	--	--	--	--	--	--	--	--	--
MW-14	3/13/2013	13.51	9.32	--	4.19	--	--	--	--	--	--	--	--	--	--
MW-15	3/13/2013	13.98	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-16	3/14/2013	13.35	10.03	--	3.32	120	400	97	470	130	0.9	<0.5	0.8	3	--
MW-17	3/13/2013	13.33	9.26	--	4.07	--	--	--	--	--	--	--	--	--	--
MW-18	3/13/2013	13.40	11.00	0.16	4.6	--	--	--	--	--	--	--	--	--	--
MW-19	3/13/2013	12.90	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-20	3/14/2013	12.90	9.71	--	3.19	130	920	230	300	<71	0.7	<0.5	<0.5	<0.5	--
MW-21	3/13/2013	12.89	8.24	--	4.65	--	--	--	--	--	--	--	--	--	--
MW-22	3/13/2013	12.79	10.04	Sheen	2.75	--	--	--	--	--	--	--	--	--	--
MW-23	3/13/2013	12.77	7.65	--	5.12	--	--	--	--	--	--	--	--	--	--
MW-24	3/13/2013	13.05	11.20	0.14	4.09	--	--	--	--	--	--	--	--	--	--
MW-25	3/14/2013	13.14	11.16	--	1.98	58	490	<30	230	<69	<0.5	<0.5	<0.5	<0.5	--
QA	3/14/2013	--	--	--	--	<50	--	--	--	--	<0.5	<0.5	<0.5	<0.5	<0.5
Proposed Screening Levels		RBC (µg/L)				14,000	>S	>S	>S	>S	1,700	210,000	4,400	23,000	62,000
		SLV (µg/L)				NE	NE	NE	NE	NE	130	9.8	7.3	13	NE

EXPLANATIONS:

TOC = Top of Casing
(ft.) = Feet

DTW = Depth to Water

GWE = Groundwater Elevation

TPH-G = Total Petroleum Hydrocarbons in the Gasoline Range

TPH-D = Total Petroleum Hydrocarbons in the Diesel Range

TPH-O = Total Petroleum Hydrocarbons in the Heavy Oil Range

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes

MTBE = Methyl Tertiary Butyl Ether

(µg/L) = Micrograms per liter

-- = Not Measured/Not Analyzed

QA = Quality Assurance/Trip Blank

(D) = Duplicate

BOLD = Detected Concentration

>S = RBC exceeds solubility limit

NE = Not Established

RBC = Risk Based Concentration for construction and excavation workers exposed to groundwater in an open excavation, which are provided in Appendix A to the Oregon Department of Environmental Quality document titled "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites" (DEQ, 2003; updated 2007, RBC Tables updated June 2012).

SLV = Screening Level Values for a Level II Screening Ecological Risk Assessment for aquatic receptors in fresh water, which are provided in Table 1 of the Oregon Department of Environmental Quality document titled "Guidance for Ecological Risk Assessment: Levels I, II, III, and IV" (DEQ, April 1998, last updated December 2001).

* = TOC Elevations were surveyed in May 2005 (updated September 2005 and June 2007) by Chase, Jones and Associates Inc. TOC elevations are referenced to mean sea level.

TOC elevations are expressed in feet relative to an arbitrary datum.

** = Groundwater elevation is corrected for the presence of SPH using: Groundwater Elevation = TOC - (DTW - (SPH thickness x Specific gravity of gasoline)). Specific gravity of gasoline is assumed at 0.80.

¹ = NWTPH-Dx with silica gel acid cleanup 10-gram column method

ANALYTICAL METHODS:

BTEX and MTBE analyzed by EPA Method 8260.

TPH-G analyzed by Northwest Method NWTPH-Gx

TPH-D and TPH-O by Northwest Method NWTPH-Dx with silica-gel cleanup.

Table 2
Groundwater Analytical Results - PAHs
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 Former Chevron Bulk Facility #1001838
 10 5th Street
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	Proposed Screening Levels		MW-6	MW-6 (D)	MW-16	MW-20	MW-25
			03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013
	RBC (µg/L)	SLV (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Acenaphthene	>S	520	<0.010	<0.0096	0.029	0.036	0.017
Acenaphthylene	NE	NE	<0.010	<0.0096	<0.0099	<0.010	<0.010
Anthracene	>S	13	<0.010	<0.0096	0.02	0.022	0.016
Benzo(a)anthracene	9.1	0.027	<0.010	<0.0096	0.019	<0.010	<0.010
Benzo(a)Pyrene	0.53	0.014	<0.010	<0.0096	<0.0099	0.011	0.017
Benzo(b)Fluoranthene	>S	NE	<0.010	<0.0096	0.017	0.018	0.037
Benzo(g,h,i)perylene	NE	NE	<0.010	<0.0096	<0.0099	0.018	0.02
Benzo(k)Fluoranthene	>S	NE	<0.010	<0.0096	<0.0099	<0.010	0.017
Chrysene	>S	NE	<0.010	<0.0096	0.019	<0.010	0.015
Dibenz(a,h)anthracene	0.21	NE	<0.010	<0.0096	<0.0099	<0.010	<0.010
Fluoranthene	>S	6.16	<0.010	<0.0096	0.068	<0.010	0.011
Fluorene	>S	3.9	<0.010	<0.0096	0.029	0.067	0.035
Indeno(1,2,3-cd)pyrene	>S	NE	<0.010	<0.0096	<0.0099	0.013	0.015
Napthalene	500	620	<0.030	0.039	0.18	0.094	0.058
Phenanthrene	NE	6.3	<0.030	<0.029	0.1	<0.030	<0.030
Pyrene	>S	NE	<0.010	<0.0096	0.042	0.022	0.018

EXPLANATIONS:

(µg/L) = Micrograms per liter

NE = Not Established

(D) = Duplicate

>S = RBC exceeds solubility limit

BOLD = Detected Concentration

Highlighted = Concentration exceeds either the RBC or the SLV

RBC = Risk Based Concentration for construction and excavation workers exposed to groundwater in an open excavation, which are provided in Appendix A to the Oregon Department of Environmental Quality document titled "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites" (DEQ, 2003; updated 2007. RBC Tables updated June 2012).

SLV = Screening Level Values for a Level II Screening Ecological Risk Assessment for aquatic receptors in fresh water, which are provided in Table 1 of the Oregon Department of Environmental Quality document titled "Guidance for Ecological Risk Assessment: Levels I, II, III, and IV" (DEQ, April 1998, last updated December 2001).

ANALYTICAL METHOD:

PAHs by EPA Method 8270SIM

Table 3
Groundwater Analytical Results - Total and Dissolved Metals
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 Former Chevron Bulk Facility #1001838
 10 5th Street
 Astoria, Oregon

	Proposed Screening Levels		MW-6	MW-6 (D)	MW-16	MW-20	MW-25
			03/14/2013	03/14/2013	03/14/2013	03/14/2013	03/14/2013
	RBC (µg/L)	SLV (µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Total Arsenic	5,800	150	<6.8	<6.8	<6.8	<6.8	<6.8
Dissolved Arsenic			<6.8	<6.8	<6.8	<6.8	<6.8
Total Barium	25,000,000	4	90.4	75.9	110	209	138
Dissolved Barium			8.7	20.4	11.4	101	111
Total Cadmium	57,000	2.2	0.7	1.0	0.48	0.66	1.2
Dissolved Cadmium			<0.36	<0.36	<0.36	0.87	0.82
Total Chromium	8,700	74	7.5	6.0	9.0	32.0	3.1
Dissolved Chromium			<1.1	<1.1	<1.1	1.7	1.1
Total Iron	NE	1,000	19,100	14,900	72,300	97,200	53,500
Dissolved Iron			1,080	777	1,550	32,400	36,300
Total Manganese	3,000,000	82,000	1,660	1,130	784	517	695
Dissolved Manganese			80.3	51.5	288	562	765
Total Selenium	NE	5	<7.5	<7.5	<7.5	<7.5	<7.5
Dissolved Selenium			<7.5	<7.5	<7.5	<7.5	<7.5
Total Silver	1,000,000	0.12	<1.2	<1.2	<1.2	<1.2	<1.2
Dissolved Silver			<1.2	<1.2	<1.2	<1.2	<1.2
Total Lead	NE	2.5	16.0	13.8	25.8	27.5	3.3
Dissolved Lead			1.0	0.79	0.11	0.81	<0.073
Total Mercury	NE	0.77	0.130	0.20	0.13	0.36	0.45
Dissolved Mercury			<0.070	<0.070	0.071	0.12	0.12

EXPLANATIONS:

(µg/L) = Micrograms per liter

NE = Not Established

(D) = Duplicate

BOLD = Detected Concentration

Highlighted = Concentration exceeds the RBC and/or SLV

RBC = Risk Based Concentration for construction and excavation workers exposed to groundwater in an open excavation, which are provided in Appendix A to the Oregon Department of Environmental Quality document titled "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites" (DEQ, 2003; updated 2007. RBC Tables updated June 2012).

SLV = Screening Level Values for a Level II Screening Ecological Risk Assessment for aquatic receptors in fresh water, which are provided in Table 1 of the Oregon Department of Environmental Quality document titled "Guidance for Ecological Risk Assessment: Levels I, II, III, and IV" (DEQ, April 1998, last updated December 2001).

ANALYTICAL METHOD:

Total and Dissolved Metals by EPA Method 6000/7000 series

Table 4
Field Measurements, Alkalinity and Methane Results
 First Semi-Annual 2013 Groundwater Monitoring Report
 Former Chevron Bulk Facility #1001838
 10 5th Street
 Astoria, Oregon

Location ID	Sample Date	Alkalinity (Total)	Free Carbon Dioxide	Methane	pH
		mg/l	µg/L	µg/L	µg/L
MW-6	03/14/2013	34.5	6,900	--	7
MW-6 (D)	03/14/2013	32.2	6,400	--	7
MW-16	03/14/2013	91.3	23,000	--	6.9
MW-20	03/14/2013	82.4	32,900	4,700	6.7
MW-25	03/14/2013	82.6	41,500	1,300	6.6

EXPLANATIONS:

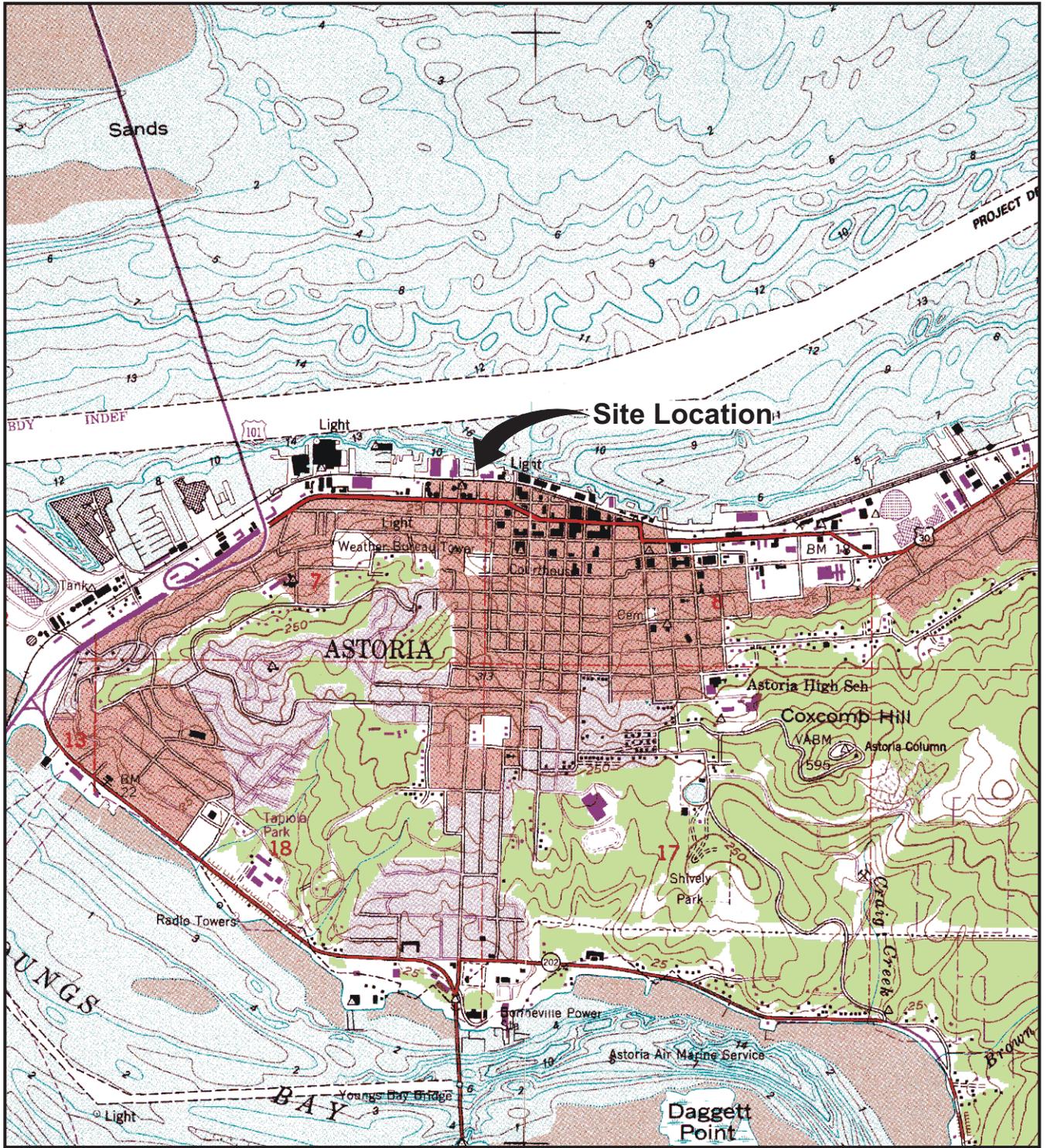
(mg/L) = Milligrams per liter
 (µg/L) = Micrograms per liter
 pH = Potential Hydrogen Ions
 -- = Not Measured
 (D) = Duplicate
BOLD = Detected Concentration

ANALYTICAL METHOD:

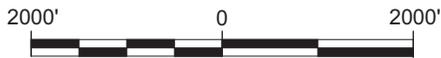
Alkalinity analyzed by SM20 2320B
 Methane analyzed by RSKSOP-175 08/11/94

ARCADIS

Figures

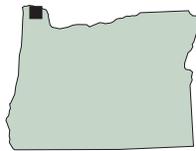


REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., ASTORIA, OREG.-WASH., 1949, PHOTOREVISED 1984.



Approximate Scale: 1" = 2000'

Area Location



OREGON



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
 FORMER CHEVRON BULK PLANT SITE NO. 100-1838
 10 5TH STREET, ASTORIA, OREGON
 2013 FIRST SEMI-ANNUAL
 GROUNDWATER MONITORING REPORT

SITE LOCATION MAP

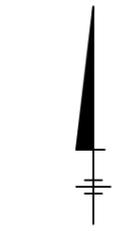
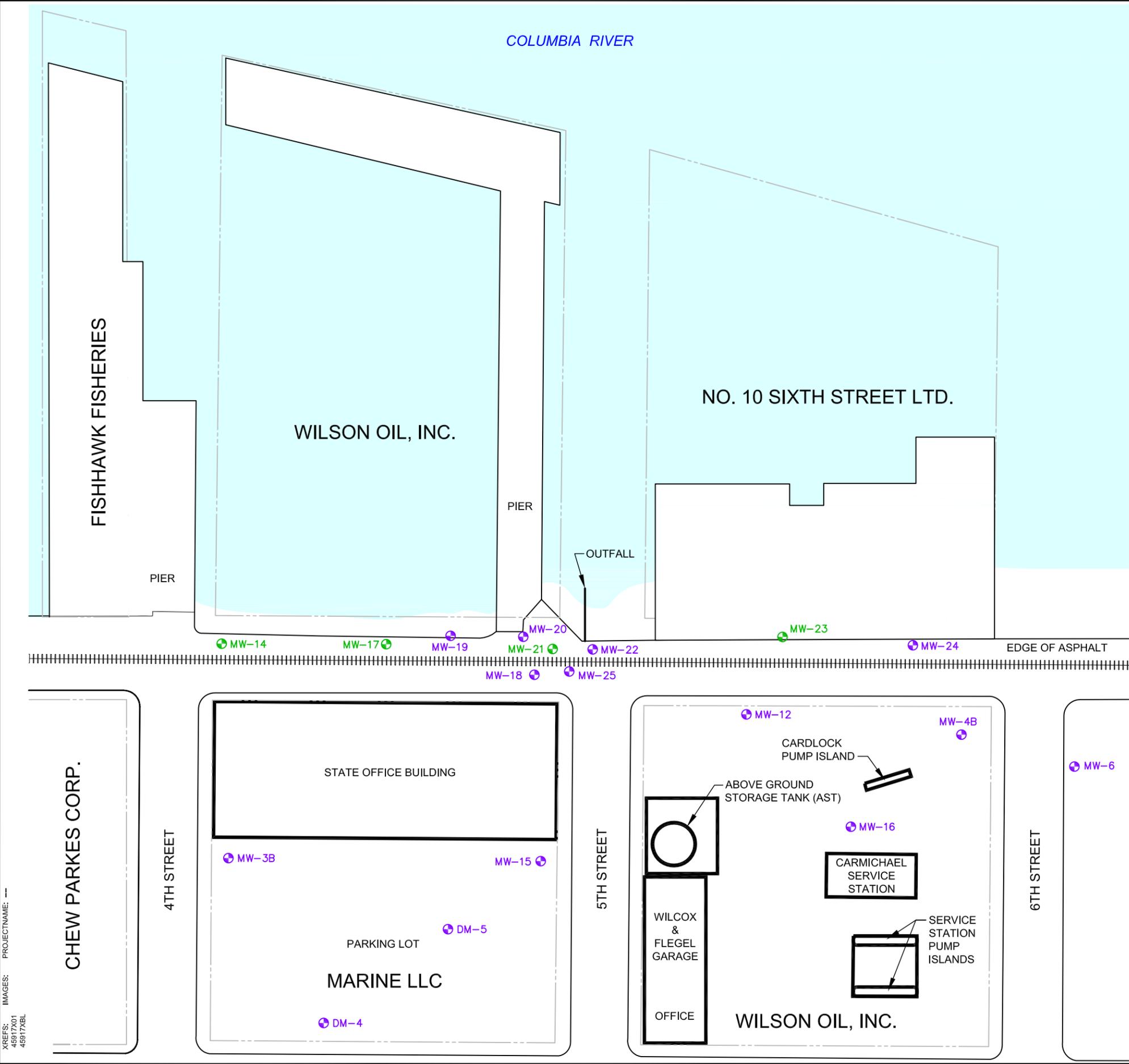


FIGURE

1

PROPERTY LOCATION IS APPROXIMATE

CITY: SYRACUSE DIM/GRP: ENV/IM/DV DB: KEW, W. JONES PM: C. ANGLER LYRON: OFF=REF
 G:\ENVCAD\SYRACUSE\ACT\B0045917\0005\GWR011\sk-Sem-Ann-2013\45917B01.dwg LAYOUT: 2 SAVED: 7/29/2013 1:30 PM ACADVER: 18.1S (LMS TECH) PAGES: 18 PAGES: 18 PLOT: 7/29/2013 1:30 PM BY: JONES, WENDY

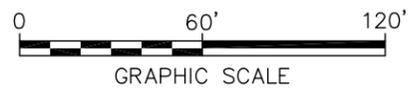


LEGEND:

-  MONITORING WELL INCLUDED IN SEMI-ANNUAL MONITORING
-  MONITORING WELL
-  PROPERTY LINE
-  TROLLEY TRACKS

NOTES:

1. BASEMAP AND WELL LOCATIONS BASED ON SURVEYS PERFORMED BETWEEN MAY 31, 2005 AND MARCH 26, 2008 BY CHASE, JONES & ASSOCIATES INC. OF PORTLAND, OREGON.
2. PROPERTY LINES ARE ADAPTED FROM CLATSOP COUNTY TAX MAP NO. "T8N R9W SEC 7DA WM", DATED AUGUST 2, 2007.



CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY
 FORMER CHEVRON BULK PLANT SITE NO. 100-1838
 10 5TH STREET, ASTORIA, OREGON
**2013 FIRST SEMI-ANNUAL
 GROUNDWATER MONITORING REPORT**

CURRENT MONITORING WELL NETWORK

 **ARCADIS**

ARCADIS

Appendices

ARCADIS

Appendix A

Groundwater Sampling Logs



GETTLER-RYAN INC.



TRANSMITTAL

March 27, 2013

G-R #: 385864

TO: Mr. Chris Angier
ARCADIS
111 SW Columbia Street, Ste. 725
Portland, OR 97201

FROM: Deanna L. Harding
Project Coordinator
Gettler-Ryan Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

RE: **Former Chevron Bulk Plant**
SS#1001838
10 5th Street
Astoria, Oregon

WE HAVE ENCLOSED THE FOLLOWING:

COPIES	DESCRIPTION
VIA PDF	Groundwater Monitoring and Sampling Data Package First Semi-Annual Event of March 13 and 14, 2013

COMMENTS:

Pursuant to your request, we are providing you with copies of the above referenced data for your use.

Please provide us the updated historical data prior to the next monitoring and sampling event for our field use.

Please feel free to contact me if you have any comments/questions.

trans/1001838



GETTLER - RYAN INC.

CHEVRON - SITE CHECK LIST	
Facility#: Chevron #1001838	Date: 3/13-14/13
Address: 10 5th Street	
City/St.: Astoria, OR	
Status of Site: ACTIVE STATION / PEDESTRIAN & TROLLEY PATH / PARKING LOT	

DRUMS:

Please list below ALL DRUMS on site:
(i.e., drum description, condition, labeling, contents and location of drum)



#	Description	Condition	Labeling	Contents/Capacity	Location
NO DRUMS					

WELLS:

Please check the condition of ALL WELLS on site:
(i.e., gaskets, bolts, well plug, well lock, well box condition and etc.)

Well ID	Gaskets (M) Missing (R) Replaced	Bolts (M) Missing (R) Replaced	Well Plug Y/N	Well Lock Y/N	Well Box Manufacturer/Size/# of Bolts	Other
DM-4	OK	OK	N	N	3" MORRIS	
DM-5			↓	↓	8" PEMCO	
MW-3B			↓	↓	8" MORRIS	
MW-4B			Y	Y	↓	
MW-6			N	N	10" SHERWOOD	
MW-12			Y	Y	3" MORRIS	
MW-14			Y	Y		
MW-15			N	N		
MW-16			Y	Y		
MW-17			Y	Y		
MW-18			N	N		
MW-19	UTL	UTL	UTL	UTL	UTL	UNABLE TO LOCATE
MW-20	OK		Y	Y	3" MORRIS	
MW-21			Y	Y		
MW-22			N	N		
MW-23			↓	↓		
MW-24			↓	↓		
MW-25			Y	Y		

Additional Comments/Observations: _____

STANDARD OPERATING PROCEDURE - GROUNDWATER SAMPLING

Gettler-Ryan Inc. (GR) field personnel adhere to the following procedures for the collection and handling of groundwater samples prior to analysis by the analytical laboratory. All work is performed in accordance with the GR Health & Safety Plan and all client-specific programs. The scope of work and type of analysis to be performed is determined prior to commencing field work.

Prior to sampling, the presence or absence of free-phase hydrocarbons is determined using an interface probe. Product thickness, if present, is measured to the nearest 0.01 foot and is noted in the field notes. In addition, all depth to water level measurements are collected with a static water level indicator and are also recorded in the field notes, prior to purging and sampling any wells.

After water levels are collected and prior to sampling, if purging is to occur, each well is purged a minimum of three well casing volumes of water using pre-cleaned pumps (stack, peristaltic or Grundfos), or disposable bailers. Temperature, pH and electrical conductivity are measured a minimum of three times during the purging (additional parameters such as dissolved oxygen, oxidation reduction potential, turbidity may also be measured, depending on specific scope of work.). Purging continues until these parameters stabilize.

Groundwater samples are collected using disposable bailers. The water samples are transferred from the bailer into appropriate containers. Pre-preserved containers, supplied by analytical laboratories, are used. When pre-preserved containers are not available, the laboratory is instructed to preserve the sample as appropriate. Duplicate samples are collected for the laboratory to use in maintaining quality assurance/quality control standards, as directed by the scope of work. The samples are labeled to include the job number, sample identification, collection date and time, analysis, preservation (if any), and the sample collector's initials. The water samples are placed in a cooler, maintained at 4°C for transport to the laboratory. Once collected in the field, all samples are maintained under chain of custody until delivered to the laboratory.

The chain of custody document includes the job number, type of preservation, if any, analysis requested, sample identification, date and time collected, and the sample collector's name. The chain of custody is signed and dated (including time of transfer) by each person who receives or surrenders the samples, beginning with the field personnel and ending with the laboratory personnel.

A laboratory supplied trip blank accompanies each sampling set. The trip blank is analyzed for some or all of the same compounds as the groundwater samples.

If purging occurred, purge water generated during sampling activities was transported to the Willbridge Terminal in Portland, Oregon.



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: DM-4 Date Monitored: 3/13/13
 Well Diameter: 2 1/4 in.
 Total Depth: _____ ft.
 Depth to Water: _____ ft.

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA METHANE LEVELS TO HIGH, O2 DEFICIENCY
DEPTH TO WATER AT LOW TIDE: NA UNABLE TO MONITOR/SAMPLE. REPAIRS
DEPTH TO WATER AT HIGH TIDE: NA TAKEN WITH EAGLE CBI



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: DM-5
 Well Diameter: 2 1/4 in.
 Total Depth: _____ ft.
 Depth to Water: _____ ft.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (umhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA METHANE LEVEL TO HIGH, O2 DEFICIENCY
DEPTH TO WATER AT LOW TIDE: NA UNABLE TO MONITOR/SAMPLE. READINGS
DEPTH TO WATER AT HIGH TIDE: NA TAKEN WITH EAGLE (6)



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: COM

Well ID: MW-3B
 Well Diameter: 2 1/4 in.
 Total Depth: _____ ft.
 Depth to Water: _____ ft.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA UNABLE TO MONITOR/ SAMPLE DUE TO HIGH METHANE LEVELS, O2 DEFICIENCY
DEPTH TO WATER AT LOW TIDE: NA READINGS TAKEN WITH EAGLE CUP
DEPTH TO WATER AT HIGH TIDE: NA

Add/Replaced Gasket:

Add/Replaced Bolt:

Add/Replaced Plug:

Add/Replaced Lock:



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: MW-4B Date Monitored: 3/13/13

Well Diameter: 2 1/4 in.

Total Depth: 20.04 ft.

Depth to Water: 9.13 ft.

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.35
 $xVF = 0.17 = 1.94$ x3 case volume = Estimated Purge Volume: 5.5 gal.

Purge Equipment:

Disposable Bailer X
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer X
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): 0825 Weather Conditions: Cloudy
 Sample Time/Date: 1 Water Color: Tan Odor: Y/N Mildewy
 Approx. Flow Rate: _____ gpm. Sediment Description: Silt
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (umhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
MW-4B	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA SHEEN PRESENT AFTER .5g
DEPTH TO WATER AT LOW TIDE: 10.11 PURGED NO SAMPLE TAKEN
DEPTH TO WATER AT HIGH TIDE: 9.00 PER CC



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13/13 - 3/14/13 (inclusive)
 Sampler: GIM

Well ID: MW-6
 Well Diameter: 2 1/4 in.
 Total Depth: 14.33 ft.
 Depth to Water: 9.25 ft.

Date Monitored: 3/13/13

Volume Factor (VF)	3/4" = 0.02	1" = 0.04	2" = 0.17	3" = 0.38
	4" = 0.66	5" = 1.02	6" = 1.50	12" = 5.80

Check if water column is less than 0.50 ft.
 $5.08 \times VF 0.66 = 3.35 \times 3 \text{ case volume} = \text{Estimated Purge Volume: } 11 \text{ gal.}$

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.26

Purge Equipment:

Disposable Bailer x
 Stainless Steel Bailer
 Stack Pump
 Suction Pump
 Grundfos
 Peristaltic Pump
 QED Bladder Pump
 Other:

Sampling Equipment:

Disposable Bailer x
 Pressure Bailer x
 Metal Filters 1
 Peristaltic Pump
 QED Bladder Pump
 Other:

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): 0715 Weather Conditions: CLOUDY
 Sample Time/Date: 0810 13/14/13 Water Color: TAN Odor: Y/N
 Approx. Flow Rate: gpm. Sediment Description: SILT
 Did well de-water? NO If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: 10.06

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm (µS))	Temperature (C F)	D.O. (mg/L)	ORP (mV)
<u>0720</u>	<u>4</u>	<u>7.64</u>	<u>221</u>	<u>11.9</u>		
<u>0725</u>	<u>8</u>	<u>7.60</u>	<u>209</u>	<u>11.6</u>		
<u>0730</u>	<u>11</u>	<u>7.59</u>	<u>206</u>	<u>11.4</u>		

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-6</u>	<u>6 x vov vial</u>	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	<u>2 x 1 liter ambers</u>	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	<u>x vov vial</u>	YES	HCL	LANCASTER	METHANE (RSK-175)
	<u>2 x 1 liter ambers</u>	YES	NP	LANCASTER	PAH's (8270 SIM)
	<u>(x 500ml poly</u>	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	<u>1 x 250ml poly</u>	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>x 500ml poly</u>	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>1 x 250ml poly</u>	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	<u>x 500ml poly</u>	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: 5 DUP TAKEN FROM THIS WELL
DEPTH TO WATER AT LOW TIDE: 9.41
DEPTH TO WATER AT HIGH TIDE: 9.22



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GIM

Well ID: MW-12
 Well Diameter: 24 in.
 Total Depth: 15.81 ft.
 Depth to Water: 7.83 ft.
7.98 xVF 0.17 = 1.35

Date Monitored: 3/13/13

Volume Factor (VF)	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 9.42

Purge Equipment:
 Disposable Bailer X
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:
 Disposable Bailer X
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): 0840 Weather Conditions: _____
 Sample Time/Date: 1 Water Color: TAN Odor: 0/1 N MODERATE
 Approx. Flow Rate: _____ gpm. Sediment Description: SILT
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: SHEEN PRESENT IN BAILOR ON 3/13
DEPTH TO WATER AT LOW TIDE: 7.90 AFTER 1 gal. NO SAMPLE TAKE
DEPTH TO WATER AT HIGH TIDE: 7.79 PER LC



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-14
 Well Diameter: 2.4 in.
 Total Depth: 12.91 ft.
 Depth to Water: 9.32 ft.
8.59 xVF = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: 3/13/13

Volume Factor (VF)	3/4" = 0.02	1" = 0.04	2" = 0.17	3" = 0.38
	4" = 0.66	5" = 1.02	6" = 1.50	12" = 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA M/D

DEPTH TO WATER AT LOW TIDE: 9.73

DEPTH TO WATER AT HIGH TIDE: 9.32



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-15
 Well Diameter: 2 1/4 in.
 Total Depth: / ft.
 Depth to Water: / ft.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbant Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____
 Sample Time/Date: _____ / _____
 Approx. Flow Rate: _____ gpm.
 Did well de-water? _____ If yes, Time: _____

Weather Conditions: _____
 Water Color: _____ Odor: Y / N
 Sediment Description: _____
 Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA UNABLE TO MONITOR/SAMPLE DUE
DEPTH TO WATER AT LOW TIDE: NA TO HIGH METHANE LEVELS & O2 DEFICIENCY
DEPTH TO WATER AT HIGH TIDE: NA READINGS TAKEN WITH FACILE CGI



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: MW-16 Date Monitored: 3/13/13

Well Diameter: 2 1/4 in.
 Total Depth: 20.14 ft.
 Depth to Water: 10.03 ft.

Volume Factor (VF)	3/4" = 0.02	1" = 0.04	2" = 0.17	3" = 0.38
	4" = 0.66	5" = 1.02	6" = 1.50	12" = 5.80

Check if water column is less than 0.50 ft.
 Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.05
 xVF 0.17 = 1.72 x3 case volume = Estimated Purge Volume: 5.5 gal.

Purge Equipment:

Disposable Bailer X
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer X
 Pressure Bailer X
 Metal Filters 1
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): 0900 Weather Conditions: CLOUDY
 Sample Time/Date: 0940 / 3/14/13 Water Color: TAN Odor: Y/N SLIGHT
 Approx. Flow Rate: _____ gpm. Sediment Description: CLAY
 Did well de-water? NO If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: 10.41

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - US)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)
<u>0904</u>	<u>2</u>	<u>7.05</u>	<u>501</u>	<u>11.6</u>		
<u>0907</u>	<u>4</u>	<u>6.95</u>	<u>493</u>	<u>11.2</u>		
<u>0910</u>	<u>5.5</u>	<u>6.91</u>	<u>486</u>	<u>11.1</u>		

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-16</u>	<u>6</u> x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	<u>2</u> x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	<u>x</u> voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	<u>2</u> x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	<u>x</u> 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	<u>1</u> x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>x</u> 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>1</u> x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	<u>x</u> 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: 5

DEPTH TO WATER AT LOW TIDE: 10.20

DEPTH TO WATER AT HIGH TIDE: 9.70



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GJM

Well ID: MW-17
 Well Diameter: 20.4 in.
 Total Depth: 20.54 ft.
 Depth to Water: 9.26 ft.
11.28 xVF = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAHs (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA M10

DEPTH TO WATER AT LOW TIDE: 9.04

DEPTH TO WATER AT HIGH TIDE: 9.26



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-18
 Well Diameter: 2.4 in.
 Total Depth: 20.01 ft.
 Depth to Water: 11.00 ft.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 9.81 xVF = 9.81 x3 case volume = Estimated Purge Volume: gal.

Purge Equipment:

- Disposable Bailer _____
- Stainless Steel Bailer _____
- Stack Pump _____
- Suction Pump _____
- Grundfos _____
- Peristaltic Pump _____
- QED Bladder Pump _____
- Other: _____

Sampling Equipment:

- Disposable Bailer _____
- Pressure Bailer _____
- Metal Filters _____
- Peristaltic Pump _____
- QED Bladder Pump _____
- Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: LOW TIDE 10.84 ft
 Depth to Water: LOW TIDE 11.00 ft
 Hydrocarbon Thickness: 0.160 ft
 Visual Confirmation/Description:
BROWN / OILY
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: / Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm -µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA SOCK IN WELL
DEPTH TO WATER AT LOW TIDE: 11.00
DEPTH TO WATER AT HIGH TIDE: 9.84



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-19
 Well Diameter: 2 1/4 in.
 Total Depth: _____ ft.
 Depth to Water: 472 ft.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA UNABLE TO LOCATE (XITL), NEW
DEPTH TO WATER AT LOW TIDE: NA GRAVEL PUT OVER WHERE WELL WAS
DEPTH TO WATER AT HIGH TIDE: NA SEARCHED WITH METAL DETECTOR FOR 30 MIN

Add/Replaced Gasket:

Add/Replaced Bolt:

Add/Replaced Plug:

Add/Replaced Lock:



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: Mw-20
 Well Diameter: 2.4 in.
 Total Depth: 19.24 ft.
 Depth to Water: 9.71 ft.

Date Monitored: 3/13/13

Volume Factor (VF)	3/4" = 0.02	1" = 0.04	2" = 0.17	3" = 0.38
	4" = 0.66	5" = 1.02	6" = 1.50	12" = 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge ((Height of Water Column x 0.20) + DTW): 11.61
 xVF 0.17 = 1.62 x3 case volume = Estimated Purge Volume: 5 gal.

Purge Equipment:

Disposable Bailer X
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer X
 Pressure Bailer _____
 Metal Filters 1
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): 1110 Weather Conditions: CLOUDY
 Sample Time/Date: 1220 13/14/13 Water Color: TAN Odor: DN SLIGHT
 Approx. Flow Rate: ~ gpm. Sediment Description: SILT
 Did well de-water? NO If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: 10.00

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm) (µS)	Temperature (C) (F)	D.O. (mg/L)	ORP (mV)
<u>1113</u>	<u>2</u>	<u>7.06</u>	<u>1112</u>	<u>11.9</u>		
<u>1115</u>	<u>3.5</u>	<u>7.09</u>	<u>1109</u>	<u>11.7</u>		
<u>1117</u>	<u>5</u>	<u>7.04</u>	<u>1106</u>	<u>11.4</u>		

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>Mw-20</u>	<u>18</u> x vov vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
<u>MS/MSD</u>	<u>6</u> x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	<u>6</u> x vov vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	<u>6</u> x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	<u>3</u> x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	<u>3</u> x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>x</u> 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>3</u> x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	<u>x</u> 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: 5

DEPTH TO WATER AT LOW TIDE: 10.75

DEPTH TO WATER AT HIGH TIDE: 9.46

Add/Replaced Gasket: _____ Add/Replaced Bolt: _____ Add/Replaced Plug: 1 Add/Replaced Lock: 1



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: **Chevron #1001838**
 Site Address: **10 5th Street**
 City: **Astoria, OR**

Job Number: **385864**
 Event Date: **3/13-14/13** (inclusive)
 Sampler: **GM**

Well ID: **MW-21**
 Well Diameter: **214** in.
 Total Depth: **18.36** ft.
 Depth to Water: **8.24** ft.
10.12 xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: **3/13/13**

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: **Y / N**
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: **DISSOLVED IRON RESULT: NA** **M/D**

DEPTH TO WATER AT LOW TIDE: **8.93**

DEPTH TO WATER AT HIGH TIDE: **8.24**



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-22
 Well Diameter: 2 1/4 in.
 Total Depth: 18.32 ft.
 Depth to Water: 10.04 ft.
8.28 xVF _____ = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: 3/13/13

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x vial	YES	HCL	LANCASTER	NWTPH-GxBTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc-COLUMN/NWTPH-Dx w/sgc
	x vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA SOLIC IN WELL, SHEEN PRESENT
DEPTH TO WATER AT LOW TIDE: 10.04 NO SAMPLE TAKEN FOR LC
DEPTH TO WATER AT HIGH TIDE: 9.73



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838
 Site Address: 10 5th Street
 City: Astoria, OR

Job Number: 385864
 Event Date: 3/13-14/13 (inclusive)
 Sampler: GM

Well ID: MW-23
 Well Diameter: 2.4 in.
 Total Depth: 10.05 ft.
 Depth to Water: 7.65 ft.
2.40 xVF = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: 3/13/13

Volume Factor (VF)	3/4" = 0.02	1" = 0.04	2" = 0.17	3" = 0.38
	4" = 0.66	5" = 1.02	6" = 1.50	12" = 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: ✓

Purge Equipment:

Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: _____ ft
 Depth to Water: _____ ft
 Hydrocarbon Thickness: _____ ft
 Visual Confirmation/Description: _____
 Skimmer / Absorbent Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____ Weather Conditions: _____
 Sample Time/Date: _____ / _____ Water Color: _____ Odor: Y / N
 Approx. Flow Rate: _____ gpm. Sediment Description: _____
 Did well de-water? _____ If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: NA M/D SOCK IN WELL
 DEPTH TO WATER AT LOW TIDE: 7.65
 DEPTH TO WATER AT HIGH TIDE: 7.65



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: **Chevron #1001838**
 Site Address: **10 5th Street**
 City: **Astoria, OR**

Job Number: **385864**
 Event Date: **3/13-14/13** (inclusive)
 Sampler: **GM**

Well ID: **MWS-24**
 Well Diameter: **21.4** in.
 Total Depth: **20.01** ft.
 Depth to Water: **11.20** ft.
8.81 xVF = _____ x3 case volume = Estimated Purge Volume: _____ gal.

Date Monitored: **3/13/13**

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Check if water column is less than 0.50 ft.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____

Purge Equipment:
 Disposable Bailer _____
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:
 Disposable Bailer _____
 Pressure Bailer _____
 Metal Filters _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started: _____ (2400 hrs)
 Time Completed: _____ (2400 hrs)
 Depth to Product: **11.06 (LOW TIDE)** ft
 Depth to Water: **11.20 (LOW TIDE)** ft
 Hydrocarbon Thickness: **.14** ft
 Visual Confirmation/Description:
Brown, oily
 Skimmer / Absorbant Sock (circle one)
 Amt Removed from Skimmer: _____ gal
 Amt Removed from Well: _____ gal
 Water Removed: _____
 Product Transferred to: _____

Start Time (purge): _____
 Sample Time/Date: _____ / _____
 Approx. Flow Rate: _____ gpm.
 Did well de-water? _____ If yes, Time: _____

Weather Conditions: _____
 Water Color: _____ Odor: **Y / N**
 Sediment Description: _____
 Volume: _____ gal. DTW @ Sampling: _____

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
	x vov vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	x vov vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: **DISSOLVED IRON RESULT: NA**

DEPTH TO WATER AT LOW TIDE: **11.20**

DEPTH TO WATER AT HIGH TIDE: **9.28**

*SOCK IN WELL, SHEEN PRESENT
NO SAMPLE TAKEN PER LC.*



GETTLER-RYAN INC.

WELL MONITORING/SAMPLING FIELD DATA SHEET

Client/Facility#: Chevron #1001838 Job Number: 385864
 Site Address: 10 5th Street Event Date: 3/13-14/13 (inclusive)
 City: Astoria, OR Sampler: GM

Well ID: MW-25 Date Monitored: 3/13/13

Well Diameter: 12.14 in.
 Total Depth: 19.95 ft.

Volume	3/4"= 0.02	1"= 0.04	2"= 0.17	3"= 0.38
Factor (VF)	4"= 0.66	5"= 1.02	6"= 1.50	12"= 5.80

Depth to Water: 11.16 ft. Check if water column is less than 0.50 ft.
8.79 xVF 0.17 = 1.49 x3 case volume = Estimated Purge Volume: 4.5 gal.

Depth to Water w/ 80% Recharge [(Height of Water Column x 0.20) + DTW]: 12.91

Purge Equipment:

Disposable Bailer X
 Stainless Steel Bailer _____
 Stack Pump _____
 Suction Pump _____
 Grundfos _____
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Sampling Equipment:

Disposable Bailer X
 Pressure Bailer X
 Metal Filters 1
 Peristaltic Pump _____
 QED Bladder Pump _____
 Other: _____

Time Started:	_____ (2400 hrs)
Time Completed:	_____ (2400 hrs)
Depth to Product:	_____ ft
Depth to Water:	_____ ft
Hydrocarbon Thickness:	_____ ft
Visual Confirmation/Description:	_____
Skimmer / Absorbent Sock (circle one)	_____
Amt Removed from Skimmer:	_____ gal
Amt Removed from Well:	_____ gal
Water Removed:	_____
Product Transferred to:	_____

Start Time (purge): 1000 Weather Conditions: cloudy
 Sample Time/Date: 1045 13/14/13 Water Color: TAN Odor: (Y) N SLIGHT
 Approx. Flow Rate: — gpm. Sediment Description: SILT
 Did well de-water? NO If yes, Time: _____ Volume: _____ gal. DTW @ Sampling: 11.91

Time (2400 hr.)	Volume (gal.)	pH	Conductivity (µmhos/cm - µS)	Temperature (C / F)	D.O. (mg/L)	ORP (mV)
<u>1003</u>	<u>1.5</u>	<u>6.94</u>	<u>673</u>	<u>11.6</u>		
<u>1006</u>	<u>3</u>	<u>6.91</u>	<u>674</u>	<u>11.5</u>		
<u>1009</u>	<u>4.5</u>	<u>6.86</u>	<u>667</u>	<u>11.4</u>		

LABORATORY INFORMATION

SAMPLE ID	(#) CONTAINER	REFRIG.	PRESERV. TYPE	LABORATORY	ANALYSES
<u>MW-25</u>	<u>1</u> x voa vial	YES	HCL	LANCASTER	NWTPH-Gx/BTEX(8260)
	<u>2</u> x 1 liter ambers	YES	HCL	LANCASTER	NWTPH-Dx w/sgc COLUMN/NWTPH-Dx w/sgc
	<u>2</u> x voa vial	YES	HCL	LANCASTER	METHANE (RSK-175)
	<u>2</u> x 1 liter ambers	YES	NP	LANCASTER	PAH's (8270 SIM)
	<u>1</u> x 500ml poly	YES	NP	LANCASTER	FREE CARBON DIOXIDE (SM30 4500-CO2)
	<u>1</u> x 250ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>1</u> x 500ml poly	YES	HNO3	LANCASTER	Total Metals(6010B)/Total Mercury(7470A)/ Total Lead (6020)
	<u>1</u> x 250ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)
	<u>1</u> x 500ml poly	YES	HNO3	LANCASTER	Dissolved Metals(6010B)/Dissolved Mercury(7470A)/ Dissolved Lead(6020)

COMMENTS: DISSOLVED IRON RESULT: 5

DEPTH TO WATER AT LOW TIDE: 11.19

DEPTH TO WATER AT HIGH TIDE: 9.54

Chevron Northwest Region Analysis Request/Chain of Custody



Please forward the lab results directly to the Lead Consultant and cc: G-R.

For Lancaster Laboratories use only

Acct. #:

Group #:

Sample #:

Facility #: SS#1001838 OML G-R#385864 WBS: _____
 Site Address: 10 5th Street, ASTORIA, OR
 Chevron PM: MH Lead Consultant: ARCADISC Angier A
 Consultant/Office: G-R, Inc., 6747 Sierra Court, Suite J, Dublin, CA 94568
 Consultant Prj. Mgr.: Deanna L. Harding (deanna@grinc.com)
 Consultant Phone #: 925-551-7555 Fax #: 925-551-7899
 Sampler: GILBERT MEDINA

Matrix	Analyses Requested												
	Preservation Codes												
<input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil <input type="checkbox"/> Air	BTEX + MTBE	8021	<input type="checkbox"/>	Naphth	<input type="checkbox"/>	H	H	H	H	Z	Z	Z	Z
	8260 <input type="checkbox"/> BTEX (3260) Organics (AHX) (3230SIM) NWTPH GX NWTPH DX w/SGC COLUMN NWTPH DX <input checked="" type="checkbox"/> Silica Gel Cleanup Lead Total <input checked="" type="checkbox"/> Method 6020 <input type="checkbox"/> WAVPH <input type="checkbox"/> WAEPH NWTPH HClD <input type="checkbox"/> quantification FREE CARBON SLOWLY (SAND 4500-C02) METHANE (RSE-175) TOTAL METAL (G0105) (Fe, As, Se, Ba, Cd, Cr, Mn, Ag, Hg, Requesting both 1 gram and 10 grams of silica gel on NWTPH-Dx w/sgc samples, report both results) METALS (MISCELLANEOUS) (L.P. Metals) TOTAL MECHANICAL ANALYSIS (3430A) (Z)												

- SCR #: _____
- Results in Dry Weight
 - J value reporting needed
 - Must meet lowest detection limits possible for 8260 compounds
 - 8021 MTBE Confirmation
 - Confirm MTBE + Naphthalene
 - Confirm highest hit by 8260
 - Confirm all hits by 8260
 - Run ___ oxy's on highest hit
 - Run ___ oxy's on all hits

Sample Identification	Date Collected	Time Collected	Grab	Composite	Soil	Water	Oil	Air	Total Number of Containers
QA	3/14/13		X			W			2
MW-16		0810							13
MW-16		0940							13
MW-20		1220							15
MW-25		1045							12
DUP									12
MW-20 MS/MCD		1220							30

Comments /Remarks

Metals include: Fe, As, Se, Ba, Cd, Cr, Mn, Ag, Hg. Requesting both 1 gram and 10 grams of silica gel on NWTPH-Dx w/sgc samples, report both results

added collection times for MW-20 to MS/MCD PM 3/20

Turnaround Time Requested (TAT) (please circle)

24 hour 72 hour 48 hour
 4 day 5 day

Data Package Options (please circle if required) **EDF/EDD**

QC Summary Type I - Full
 Type VI (Raw Data)

Relinquished by: _____	Date: 3/15/13	Time: 0900	Received by: GUTTERER AD FRIDGE	Date: 4/18/13	Time: 0300
Relinquished by: _____	Date: 03-15-13	Time: 1330	Received by: _____	Date: 3/18/13	Time: 1330
Relinquished by Commercial Carrier: _____	UPS	FedEx	Other: _____	Received by: _____	Date: _____ Time: _____
Temperature Upon Receipt: _____ C°	Custody Seals Intact? Yes No				

ARCADIS

Appendix B

Gettler-Ryan, Inc. Standard
Operating Procedure – Groundwater
Sampling

STANDARD OPERATING PROCEDURE - GROUNDWATER SAMPLING

Gettler-Ryan Inc. (GR) field personnel adhere to the following procedures for the collection and handling of groundwater samples prior to analysis by the analytical laboratory. All work is performed in accordance with the GR Health & Safety Plan and all client-specific programs. The scope of work and type of analysis to be performed is determined prior to commencing field work.

Prior to sampling, the presence or absence of free-phase hydrocarbons is determined using an interface probe. Product thickness, if present, is measured to the nearest 0.01 foot and is noted in the field notes. In addition, all depth to water level measurements are collected with a static water level indicator and are also recorded in the field notes, prior to purging and sampling any wells.

After water levels are collected and prior to sampling, if purging is to occur, each well is purged a minimum of three well casing volumes of water using pre-cleaned pumps (stack, peristaltic or Grundfos), or disposable bailers. Temperature, pH and electrical conductivity are measured a minimum of three times during the purging (additional parameters such as dissolved oxygen, oxidation reduction potential, turbidity may also be measured, depending on specific scope of work.). Purging continues until these parameters stabilize.

Groundwater samples are collected using disposable bailers. The water samples are transferred from the bailer into appropriate containers. Pre-preserved containers, supplied by analytical laboratories, are used. When pre-preserved containers are not available, the laboratory is instructed to preserve the sample as appropriate. Duplicate samples are collected for the laboratory to use in maintaining quality assurance/quality control standards, as directed by the scope of work. The samples are labeled to include the job number, sample identification, collection date and time, analysis, preservation (if any), and the sample collector's initials. The water samples are placed in a cooler, maintained at 4°C for transport to the laboratory. Once collected in the field, all samples are maintained under chain of custody until delivered to the laboratory.

The chain of custody document includes the job number, type of preservation, if any, analysis requested, sample identification, date and time collected, and the sample collector's name. The chain of custody is signed and dated (including time of transfer) by each person who receives or surrenders the samples, beginning with the field personnel and ending with the laboratory personnel.

A laboratory supplied trip blank accompanies each sampling set. The trip blank is analyzed for some or all of the same compounds as the groundwater samples.

If purging occurred, purge water generated during sampling activities was transported to the Willbridge Terminal in Portland, Oregon.

Appendix C

Analytical Laboratory Reports and
Chains of Custody

ANALYTICAL RESULTS

Prepared by:

Lancaster Laboratories
2425 New Holland Pike
Lancaster, PA 17605-2425

Prepared for:

Chevron
L4310
6001 Bollinger Canyon Rd.
San Ramon CA 94583

March 30, 2013

Project: 1001838

Submittal Date: 03/19/2013

Group Number: 1376662

PO Number: 0015117901

Release Number: HARMON

State of Sample Origin: OR

<u>Client Sample Description</u>	<u>Lancaster Labs (LLI) #</u>
QA Water	6989320
MW-6 Grab Water	6989321
MW-6 Filtered Grab Water	6989322
MW-16 Grab Water	6989323
MW-16 Filtered Grab Water	6989324
MW-20 Grab Water	6989325
MW-20 Matrix Spike Grab Water	6989326
MW-20 Matrix Spike Dup Grab Water	6989327
MW-20 Duplicate Grab Water	6989328
MW-20 Filtered Grab Water	6989329
MW-20 Matrix Spike Filtered Grab Water	6989330
MW-20 Matrix Spike Dup Filtered Grab Water	6989331
MW-20 Duplicate Filtered Grab Water	6989332
MW-25 Grab Water	6989333
MW-25 Filtered Grab Water	6989334
DUP Grab Water	6989335
DUP Filtered Grab Water	6989336

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO
ELECTRONIC COPY TO
Arcadis c/o Gettler-Ryan
Arcadis

Attn: Rachelle Munoz
Attn: Chris Angier

Respectfully Submitted,



Jill M. Parker
Senior Specialist

(717) 556-7262

Sample Description: QA Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989320
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013

Chevron

Submitted: 03/19/2013 21:00

L4310

Reported: 03/30/2013 09:45

6001 Bollinger Canyon Rd.
 San Ramon CA 94583

5TAQA

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles SW-846 8260B			ug/l	ug/l	
10943	Benzene	71-43-2	N.D.	0.5	1
10943	Ethylbenzene	100-41-4	N.D.	0.5	1
10943	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	N.D.	0.5	1
GC Volatiles ECY 97-602 NWTPH-Gx			ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX/MTBE 8260 Water	SW-846 8260B	1	F130841AA	03/25/2013 16:28	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130841AA	03/25/2013 16:28	Anita M Dale	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/21/2013 22:48	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/21/2013 22:48	Laura M Krieger	1

Sample Description: MW-6 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989321
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 08:10 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	
10943	Benzene	71-43-2	N.D.	0.5	1
10943	Ethylbenzene	100-41-4	N.D.	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	N.D.	0.5	1
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	N.D.	0.010	1
08357	Acenaphthylene	208-96-8	N.D.	0.010	1
08357	Anthracene	120-12-7	N.D.	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.010	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	1
08357	Chrysene	218-01-9	N.D.	0.010	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	1
08357	Fluoranthene	206-44-0	N.D.	0.010	1
08357	Fluorene	86-73-7	N.D.	0.010	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.010	1
08357	Naphthalene	91-20-3	N.D.	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.030	1
08357	Pyrene	129-00-0	N.D.	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
 The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	ECY 97-602 NWTPH-Gx	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50

GC Petroleum	ECY 97-602 NWTPH-Dx	ug/l	ug/l	
Hydrocarbons w/Si modified				
02211	DRO C12-C24 w/Si Gel	n.a.	N.D.	30
12005	DRO C12-C24 w/Si Gel	n.a.	N.D.	30
02211	HRO C24-C40 w/Si Gel	n.a.	100	71
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	71

The reverse surrogate, capric acid, is present at <1%.

Metals	SW-846 6010B	ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8
07046	Barium	7440-39-3	90.4	0.33
07049	Cadmium	7440-43-9	0.70	0.36
07051	Chromium	7440-47-3	7.5	1.1
01754	Iron	7439-89-6	19,100	33.3
07058	Manganese	7439-96-5	1,660	0.83
07036	Selenium	7782-49-2	N.D.	7.5
07066	Silver	7440-22-4	N.D.	1.2

Sample Description: MW-6 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989321
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 08:10 by GM Chevron
 Submitted: 03/19/2013 21:00 L4310
 Reported: 03/30/2013 09:45 6001 Bollinger Canyon Rd.
 San Ramon CA 94583

5TA06

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
06035	Lead	SW-846 6020 7439-92-1	ug/l 16.0	ug/l 0.073	1
00259	Mercury	SW-846 7470A 7439-97-6	ug/l 0.13	ug/l 0.070	1
Wet Chemistry					
12150	Total Alkalinity	SM 2320 B-1997 n.a.	ug/l as CaCO3 34,500	ug/l as CaCO3 700	1
12149	Bicarbonate Alkalinity	n.a.	34,500	700	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997 n.a.	ug/l 6,900	ug/l 700	1
12152	pH	SM 4500-H+ B-2000 n.a.	Std. Units 7.0	Std. Units 0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130841AA	03/25/2013 07:10	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130841AA	03/25/2013 07:10	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 08:47	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 03:30	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 03:30	Laura M Krieger	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 01:04	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 12:30	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:38	Tara L Snyder	1

Sample Description: MW-6 Grab Water
 Facility# 1001838 Job# 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989321
 LLI Group # 1376662
 Account # 11928

Project Name: 1001838

Collected: 03/14/2013 08:10 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA06

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 11:10	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:26	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:23	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Connors	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 00:54	Clayton C Litchmore	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 00:54	Clayton C Litchmore	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997	1	13079002208A	03/26/2013 12:50	Clayton C Litchmore	1
12152	pH	SM 4500-H+ B-2000	2	13079002208A	03/21/2013 00:54	Clayton C Litchmore	1

Sample Description: MW-6 Filtered Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989322
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 08:10 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	8.7	0.33	1
07049	Cadmium	7440-43-9	N.D.	0.36	1
07051	Chromium	7440-47-3	N.D.	1.1	1
01754	Iron	7439-89-6	1,080	33.3	1
07058	Manganese	7439-96-5	80.3	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	1.0	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	N.D.	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:43	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 11:14	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:28	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:39	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Connors	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: MW-16 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989323
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 09:40 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA16

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	
10943	Benzene	71-43-2	0.9	0.5	1
10943	Ethylbenzene	100-41-4	0.8	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	3	0.5	1
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.029	0.0099	1
08357	Acenaphthylene	208-96-8	N.D.	0.0099	1
08357	Anthracene	120-12-7	0.020	0.0099	1
08357	Benzo(a)anthracene	56-55-3	0.019	0.0099	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.0099	1
08357	Benzo(b)fluoranthene	205-99-2	0.017	0.0099	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.0099	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.0099	1
08357	Chrysene	218-01-9	0.019	0.0099	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0099	1
08357	Fluoranthene	206-44-0	0.068	0.0099	1
08357	Fluorene	86-73-7	0.029	0.0099	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0099	1
08357	Naphthalene	91-20-3	0.18	0.030	1
08357	Phenanthrene	85-01-8	0.10	0.030	1
08357	Pyrene	129-00-0	0.042	0.0099	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
 The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial. Target compounds were not detected in the re-extraction of the sample.

GC Volatiles	ECY 97-602 NWTPH-Gx	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	120	50
GC Petroleum Hydrocarbons w/Si	ECY 97-602 NWTPH-Dx modified	ug/l	ug/l	
02211	DRO C12-C24 w/Si Gel	n.a.	400	30
12005	DRO C12-C24 w/Si Gel	n.a.	97	30
02211	HRO C24-C40 w/Si Gel	n.a.	470	70
12005	HRO C24-C40 w/Si Gel	n.a.	130	70

The reverse surrogate, capric acid, is present at <1%.

Metals	SW-846 6010B	ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8
07046	Barium	7440-39-3	110	0.33
07049	Cadmium	7440-43-9	0.48	0.36
07051	Chromium	7440-47-3	9.0	1.1
01754	Iron	7439-89-6	72,300	33.3
07058	Manganese	7439-96-5	784	0.83
07036	Selenium	7782-49-2	N.D.	7.5

Sample Description: MW-16 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989323
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 09:40 by GM Chevron
 Submitted: 03/19/2013 21:00 L4310
 Reported: 03/30/2013 09:45 6001 Bollinger Canyon Rd.
 San Ramon CA 94583

5TA16

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
07066	Silver	SW-846 6010B 7440-22-4	ug/l N.D.	ug/l 1.2	1
06035	Lead	SW-846 6020 7439-92-1	ug/l 25.8	ug/l 0.073	1
00259	Mercury	SW-846 7470A 7439-97-6	ug/l 0.13	ug/l 0.070	1
Wet Chemistry					
12150	Total Alkalinity	SM 2320 B-1997 n.a.	ug/l as CaCO3 91,300	ug/l as CaCO3 700	1
12149	Bicarbonate Alkalinity	n.a.	91,300	700	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997 n.a.	ug/l 23,000	ug/l 700	1
12152	pH	SM 4500-H+ B-2000 n.a.	Std. Units 6.9	Std. Units 0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013 06:59	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013 06:59	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 09:18	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 03:52	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 03:52	Laura M Krieger	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 01:26	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 14:58	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 11:26	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 11:26	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 11:26	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 11:26	Eric L Eby	1

Sample Description: MW-16 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989323
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 09:40 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA16

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013	11:26	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013	11:26	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013	02:55	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013	11:26	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013	04:30	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013	10:25	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013	11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013	09:07	Denise K Connors	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013	16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208B	03/21/2013	01:09	Clayton C Litchmore	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	13079002208B	03/21/2013	01:09	Clayton C Litchmore	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997	1	13079002208B	03/26/2013	12:50	Clayton C Litchmore	1
12152	pH	SM 4500-H+ B-2000	2	13079002208B	03/21/2013	01:09	Clayton C Litchmore	1

Sample Description: MW-16 Filtered Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989324
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 09:40 by GM Chevron
 L4310
 Submitted: 03/19/2013 21:00 6001 Bollinger Canyon Rd.
 Reported: 03/30/2013 09:45 San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	11.4	0.33	1
07049	Cadmium	7440-43-9	N.D.	0.36	1
07051	Chromium	7440-47-3	N.D.	1.1	1
01754	Iron	7439-89-6	1,550	33.3	1
07058	Manganese	7439-96-5	288	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	0.11	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.071	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:59	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 11:30	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:32	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:41	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Connors	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: MW-20 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989325
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles SW-846 8260B ug/l ug/l					
10943	Benzene	71-43-2	0.7	0.5	1
10943	Ethylbenzene	100-41-4	N.D.	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	N.D.	0.5	1
GC/MS Semivolatiles SW-846 8270C SIM ug/l ug/l					
08357	Acenaphthene	83-32-9	0.036	0.010	1
08357	Acenaphthylene	208-96-8	N.D.	0.010	1
08357	Anthracene	120-12-7	0.022	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.011	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.018	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.018	0.010	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.010	1
08357	Chrysene	218-01-9	N.D.	0.010	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	1
08357	Fluoranthene	206-44-0	N.D.	0.010	1
08357	Fluorene	86-73-7	0.067	0.010	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.013	0.010	1
08357	Naphthalene	91-20-3	0.094	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.030	1
08357	Pyrene	129-00-0	0.022	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:

The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles ECY 97-602 NWTPH-Gx ug/l ug/l					
08273	NWTPH-Gx water C7-C12	n.a.	130	50	1
GC Miscellaneous RSKSOP-175 modified ug/l ug/l					
07105	Methane	74-82-8	4,700	60	20
GC Petroleum ECY 97-602 NWTPH-Dx ug/l ug/l					
Hydrocarbons w/Si modified					
02211	DRO C12-C24 w/Si Gel	n.a.	920	30	1
12005	DRO C12-C24 w/Si Gel	n.a.	230	30	1
02211	HRO C24-C40 w/Si Gel	n.a.	300	71	1
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	71	1
The reverse surrogate, capric acid, is present at <1%.					
Metals SW-846 6010B ug/l ug/l					
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	209	0.33	1
07049	Cadmium	7440-43-9	0.66	0.36	1
07051	Chromium	7440-47-3	32.0	1.1	1

Sample Description: MW-20 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989325
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM Chevron
 Submitted: 03/19/2013 21:00 L4310
 Reported: 03/30/2013 09:45 6001 Bollinger Canyon Rd.
 San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
		SW-846 6010B	ug/l	ug/l	
01754	Iron	7439-89-6	97,200	33.3	1
07058	Manganese	7439-96-5	517	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
		SW-846 6020	ug/l	ug/l	
06035	Lead	7439-92-1	27.5	0.073	1
		SW-846 7470A	ug/l	ug/l	
00259	Mercury	7439-97-6	0.36	0.070	1
Wet Chemistry					
		SM 2320 B-1997	ug/l as CaCO3	ug/l as CaCO3	
12150	Total Alkalinity	n.a.	82,400	700	1
12149	Bicarbonate Alkalinity	n.a.	82,400	700	1
		SM 4500-CO2 D-1997	ug/l	ug/l	
00238	Free Carbon Dioxide	n.a.	32,900	700	1
		SM 4500-H+ B-2000	Std. Units	Std. Units	
12152	pH	n.a.	6.7	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013 08:42	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013 08:42	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 05:08	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 06:03	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 06:03	Laura M Krieger	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	130850001A	03/26/2013 17:25	Elizabeth J Marin	20
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 01:49	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 14:13	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1

Sample Description: MW-20 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989325
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:14	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 10:45	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:09	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:27	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Connors	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:19	Clayton C Litchmore	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:19	Clayton C Litchmore	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997	1	13079002208A	03/26/2013 12:50	Clayton C Litchmore	1
12152	pH	SM 4500-H+ B-2000	2	13079002208A	03/21/2013 01:19	Clayton C Litchmore	1

Sample Description: **MW-20 Matrix Spike Grab Water**
 Facility# 1001838 Job# 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989326
 LLI Group # 1376662
 Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles SW-846 8260B ug/l					
10943	Benzene	71-43-2	20	0.5	1
10943	Ethylbenzene	100-41-4	19	0.5	1
10943	Toluene	108-88-3	19	0.5	1
10943	Xylene (Total)	1330-20-7	57	0.5	1
GC/MS Semivolatiles SW-846 8270C SIM ug/l					
08357	Acenaphthene	83-32-9	0.87	0.0099	1
08357	Acenaphthylene	208-96-8	0.79	0.0099	1
08357	Anthracene	120-12-7	0.92	0.0099	1
08357	Benzo(a)anthracene	56-55-3	0.74	0.0099	1
08357	Benzo(a)pyrene	50-32-8	0.70	0.0099	1
08357	Benzo(b)fluoranthene	205-99-2	0.74	0.0099	1
08357	Benzo(g,h,i)perylene	191-24-2	0.72	0.0099	1
08357	Benzo(k)fluoranthene	207-08-9	0.65	0.0099	1
08357	Chrysene	218-01-9	0.67	0.0099	1
08357	Dibenz(a,h)anthracene	53-70-3	0.74	0.0099	1
08357	Fluoranthene	206-44-0	0.82	0.0099	1
08357	Fluorene	86-73-7	0.79	0.0099	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.74	0.0099	1
08357	Naphthalene	91-20-3	0.92	0.030	1
08357	Phenanthrene	85-01-8	0.85	0.030	1
08357	Pyrene	129-00-0	0.73	0.0099	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
 The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles ECY 97-602 NWTPH-Gx ug/l					
08273	NWTPH-Gx water C7-C12	n.a.	960	50	1

GC Miscellaneous RSKSOP-175 modified ug/l					
07105	Methane	74-82-8	2,600	E	3.0

GC Petroleum ECY 97-602 NWTPH-Dx ug/l					
Hydrocarbons w/Si modified					
02211	DRO C12-C24 w/Si Gel	n.a.	2,200	30	1
12005	DRO C12-C24 w/Si Gel	n.a.	1,400	30	1
02211	HRO C24-C40 w/Si Gel	n.a.	350	70	1
12005	HRO C24-C40 w/Si Gel	n.a.	89	70	1

The reverse surrogate, capric acid, is present at <1%.

Metals SW-846 6010B ug/l					
07035	Arsenic	7440-38-2	150	6.8	1
07046	Barium	7440-39-3	2,240	0.33	1
07049	Cadmium	7440-43-9	48.5	0.36	1
07051	Chromium	7440-47-3	241	1.1	1

Sample Description: MW-20 Matrix Spike Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989326
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
		SW-846 6010B	ug/l	ug/l	
01754	Iron	7439-89-6	103,000	33.3	1
07058	Manganese	7439-96-5	1,080	0.83	1
07036	Selenium	7782-49-2	150	7.5	1
07066	Silver	7440-22-4	41.1	1.2	1
SW-846 6020					
06035	Lead	7439-92-1	43.8	0.073	1
SW-846 7470A					
00259	Mercury	7439-97-6	1.5	0.070	1
Wet Chemistry					
		SM 2320 B-1997	ug/l as CaCO3	ug/l as CaCO3	
12150	Total Alkalinity	n.a.	251,000	700	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis		Analyst	Dilution Factor
					Date	Time		
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013	08:20	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013	08:20	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013	05:40	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013	16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013	06:25	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013	06:25	Laura M Krieger	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	130850001A	03/26/2013	15:21	Elizabeth J Marin	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013	00:19	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013	14:36	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013	10:00	Elizabeth A Sholder	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013	10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013	10:57	Eric L Eby	1

Sample Description: MW-20 Matrix Spike Grab Water
 Facility# 1001838 Job# 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989326
 LLI Group # 1376662
 Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:26	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 10:57	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:14	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:31	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Conners	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:25	Clayton C Litchmore	1

Sample Description: MW-20 Matrix Spike Dup Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989327
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8260B	ug/l	ug/l	
10943	Benzene	71-43-2	21	0.5	1
10943	Ethylbenzene	100-41-4	20	0.5	1
10943	Toluene	108-88-3	20	0.5	1
10943	Xylene (Total)	1330-20-7	60	0.5	1
GC/MS	Semivolatiles	SW-846 8270C SIM	ug/l	ug/l	
08357	Acenaphthene	83-32-9	0.82	0.0099	1
08357	Acenaphthylene	208-96-8	0.76	0.0099	1
08357	Anthracene	120-12-7	0.89	0.0099	1
08357	Benzo(a)anthracene	56-55-3	0.74	0.0099	1
08357	Benzo(a)pyrene	50-32-8	0.70	0.0099	1
08357	Benzo(b)fluoranthene	205-99-2	0.74	0.0099	1
08357	Benzo(g,h,i)perylene	191-24-2	0.73	0.0099	1
08357	Benzo(k)fluoranthene	207-08-9	0.69	0.0099	1
08357	Chrysene	218-01-9	0.67	0.0099	1
08357	Dibenz(a,h)anthracene	53-70-3	0.77	0.0099	1
08357	Fluoranthene	206-44-0	0.84	0.0099	1
08357	Fluorene	86-73-7	0.77	0.0099	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.75	0.0099	1
08357	Naphthalene	91-20-3	0.89	0.030	1
08357	Phenanthrene	85-01-8	0.84	0.030	1
08357	Pyrene	129-00-0	0.73	0.0099	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles	ECY 97-602 NWTPH-Gx	ug/l	ug/l	
08273	NWTPH-Gx water C7-C12	n.a.	1,100	50

GC Miscellaneous	RSKSOP-175 modified	ug/l	ug/l	
07105	Methane	74-82-8	2,600 E	3.0

GC Petroleum Hydrocarbons w/Si	ECY 97-602 NWTPH-Dx modified	ug/l	ug/l	
02211	DRO C12-C24 w/Si Gel	n.a.	2,400	30
12005	DRO C12-C24 w/Si Gel	n.a.	1,300	30
02211	HRO C24-C40 w/Si Gel	n.a.	350	69
12005	HRO C24-C40 w/Si Gel	n.a.	76	69

The reverse surrogate, capric acid, is present at <1%.

Metals	SW-846 6010B	ug/l	ug/l	
07035	Arsenic	7440-38-2	149	6.8
07046	Barium	7440-39-3	2,260	0.33
07049	Cadmium	7440-43-9	48.9	0.36
07051	Chromium	7440-47-3	238	1.1

Sample Description: MW-20 Matrix Spike Dup Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989327
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
		SW-846 6010B	ug/l	ug/l	
01754	Iron	7439-89-6	100,000	33.3	1
07058	Manganese	7439-96-5	1,060	0.83	1
07036	Selenium	7782-49-2	152	7.5	1
07066	Silver	7440-22-4	41.0	1.2	1
SW-846 6020					
06035	Lead	7439-92-1	46.6	0.073	1
SW-846 7470A					
00259	Mercury	7439-97-6	1.3	0.070	1
Wet Chemistry					
		SM 2320 B-1997	ug/l as CaCO3	ug/l as CaCO3	
12150	Total Alkalinity	n.a.	246,000	700	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013 09:03	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013 09:03	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 06:11	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 06:46	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 06:46	Laura M Krieger	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	130850001A	03/26/2013 15:39	Elizabeth J Marin	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 00:41	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 13:39	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 11:01	Eric L Eby	1

Sample Description: MW-20 Matrix Spike Dup Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989327
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time		Analyst	Dilution Factor
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013	02:30	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013	11:01	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013	04:16	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013	10:37	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013	11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013	09:07	Denise K Conners	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013	16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013	01:31	Clayton C Litchmore	1

Sample Description: MW-20 Duplicate Grab Water
Facility# 1001838 **Job#** 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989328
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM Chevron
 L4310
 Submitted: 03/19/2013 21:00 6001 Bollinger Canyon Rd.
 Reported: 03/30/2013 09:45 San Ramon CA 94583

5TA20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals			SW-846 6010B	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	228	0.33	1
07049	Cadmium	7440-43-9	0.82	0.36	1
07051	Chromium	7440-47-3	33.3	1.1	1
01754	Iron	7439-89-6	100,000	33.3	1
07058	Manganese	7439-96-5	539	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
			SW-846 6020	ug/l	
06035	Lead	7439-92-1	28.7	0.073	1
			SW-846 7470A	ug/l	
00259	Mercury	7439-97-6	0.50	0.070	1
Wet Chemistry			SM 2320 B-1997	ug/l as CaCO3	
12150	Total Alkalinity	n.a.	81,100	700	1
			SM 4500-H+ B-2000	Std. Units	
12152	pH	n.a.	6.8	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848007	03/26/2013 02:22	Tara L Snyder	1
07066	Silver	SW-846 6010B	1	130801848007	03/25/2013 10:53	Eric L Eby	1
06035	Lead	SW-846 6020	1	130806050001A	03/25/2013 04:12	Choon Y Tian	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:29	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848007	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130806050001	03/22/2013 09:07	Denise K Conners	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:36	Clayton C Litchmore	1

Sample Description: MW-20 Duplicate Grab Water
 Facility# 1001838 Job# 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989328
 LLI Group # 1376662
 Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA20

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12152	pH	SM 4500-H+ B-2000	2	13079002208A	03/21/2013 01:36	Clayton C Litchmore	1

Sample Description: MW-20 Filtered Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989329
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TF20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	101	0.33	1
07049	Cadmium	7440-43-9	0.87	0.36	1
07051	Chromium	7440-47-3	1.7	1.1	1
01754	Iron	7439-89-6	32,400	33.3	1
07058	Manganese	7439-96-5	562	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	0.81	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.12	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:27	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:27	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:43	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: MW-20 Matrix Spike Filtered Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989330
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TF20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	155	6.8	1
07046	Barium	7440-39-3	2,050	0.33	1
07049	Cadmium	7440-43-9	49.7	0.36	1
07051	Chromium	7440-47-3	203	1.1	1
01754	Iron	7439-89-6	31,900	33.3	1
07058	Manganese	7439-96-5	1,030	0.83	1
07036	Selenium	7782-49-2	150	7.5	1
07066	Silver	7440-22-4	52.3	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	15.8	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.95	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:38	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:32	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:51	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: **MW-20 Matrix Spike Dup Filtered Grab Water**
 Facility# 1001838 Job# 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989331
 LLI Group # 1376662
 Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TF20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	150	6.8	1
07046	Barium	7440-39-3	2,030	0.33	1
07049	Cadmium	7440-43-9	48.7	0.36	1
07051	Chromium	7440-47-3	202	1.1	1
01754	Iron	7439-89-6	32,000	33.3	1
07058	Manganese	7439-96-5	1,030	0.83	1
07036	Selenium	7782-49-2	147	7.5	1
07066	Silver	7440-22-4	52.1	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	16.1	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.94	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:42	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:34	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:54	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: MW-20 Duplicate Filtered Grab Water
Facility# 1001838 **Job#** 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989332
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 12:20 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TF20

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	99.2	0.33	1
07049	Cadmium	7440-43-9	0.74	0.36	1
07051	Chromium	7440-47-3	2.4	1.1	1
01754	Iron	7439-89-6	31,900	33.3	1
07058	Manganese	7439-96-5	551	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	0.83	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.15	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:35	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:30	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:45	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: MW-25 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989333
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 10:45 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA25

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles SW-846 8260B ug/l ug/l					
10943	Benzene	71-43-2	N.D.	0.5	1
10943	Ethylbenzene	100-41-4	N.D.	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	N.D.	0.5	1
GC/MS Semivolatiles SW-846 8270C SIM ug/l ug/l					
08357	Acenaphthene	83-32-9	0.017	0.010	1
08357	Acenaphthylene	208-96-8	N.D.	0.010	1
08357	Anthracene	120-12-7	0.016	0.010	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.010	1
08357	Benzo(a)pyrene	50-32-8	0.017	0.010	1
08357	Benzo(b)fluoranthene	205-99-2	0.037	0.010	1
08357	Benzo(g,h,i)perylene	191-24-2	0.020	0.010	1
08357	Benzo(k)fluoranthene	207-08-9	0.017	0.010	1
08357	Chrysene	218-01-9	0.015	0.010	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.010	1
08357	Fluoranthene	206-44-0	0.011	0.010	1
08357	Fluorene	86-73-7	0.035	0.010	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	0.015	0.010	1
08357	Naphthalene	91-20-3	0.058	0.030	1
08357	Phenanthrene	85-01-8	N.D.	0.030	1
08357	Pyrene	129-00-0	0.018	0.010	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
 The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles ECY 97-602 NWTPH-Gx ug/l ug/l					
08273	NWTPH-Gx water C7-C12	n.a.	58	50	1

GC Miscellaneous RSKSOP-175 modified ug/l ug/l					
07105	Methane	74-82-8	1,300	30	10

GC Petroleum ECY 97-602 NWTPH-Dx ug/l ug/l					
Hydrocarbons w/Si modified					
02211	DRO C12-C24 w/Si Gel	n.a.	490	30	1
12005	DRO C12-C24 w/Si Gel	n.a.	N.D.	30	1
02211	HRO C24-C40 w/Si Gel	n.a.	230	69	1
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	69	1

The reverse surrogate, capric acid, is present at <1%.

Metals SW-846 6010B ug/l ug/l					
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	138	0.33	1
07049	Cadmium	7440-43-9	1.2	0.36	1
07051	Chromium	7440-47-3	3.1	1.1	1

Sample Description: MW-25 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989333
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 10:45 by GM Chevron
 L4310
 Submitted: 03/19/2013 21:00 6001 Bollinger Canyon Rd.
 Reported: 03/30/2013 09:45 San Ramon CA 94583

5TA25

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
		SW-846 6010B	ug/l	ug/l	
01754	Iron	7439-89-6	53,500	33.3	1
07058	Manganese	7439-96-5	695	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
		SW-846 6020	ug/l	ug/l	
06035	Lead	7439-92-1	3.3	0.073	1
		SW-846 7470A	ug/l	ug/l	
00259	Mercury	7439-97-6	0.45	0.070	1
Wet Chemistry					
		SM 2320 B-1997	ug/l as CaCO3	ug/l as CaCO3	
12150	Total Alkalinity	n.a.	82,600	700	1
12149	Bicarbonate Alkalinity	n.a.	82,600	700	1
		SM 4500-CO2 D-1997	ug/l	ug/l	
00238	Free Carbon Dioxide	n.a.	41,500	700	1
		SM 4500-H+ B-2000	Std. Units	Std. Units	
12152	pH	n.a.	6.6	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013 09:34	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013 09:34	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 09:49	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 04:14	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 04:14	Laura M Krieger	1
07105	Volatile Headspace Hydrocarbon	RSKSOP-175 modified	1	130850001A	03/26/2013 17:42	Elizabeth J Marin	10
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 02:11	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 12:53	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1

Sample Description: MW-25 Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989333
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 10:45 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TA25

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:49	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:44	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:39	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:42	Clayton C Litchmore	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:42	Clayton C Litchmore	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997	1	13079002208A	03/26/2013 12:50	Clayton C Litchmore	1
12152	pH	SM 4500-H+ B-2000	2	13079002208A	03/21/2013 01:42	Clayton C Litchmore	1

Sample Description: MW-25 Filtered Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989334
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 10:45 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved SW-846 6010B			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	111	0.33	1
07049	Cadmium	7440-43-9	0.82	0.36	1
07051	Chromium	7440-47-3	1.1	1.1	1
01754	Iron	7439-89-6	36,300	33.3	1
07058	Manganese	7439-96-5	765	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6020			ug/l	ug/l	
06035	Lead	7439-92-1	N.D.	0.073	1
SW-846 7470A			ug/l	ug/l	
00259	Mercury	7439-97-6	0.12	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 09:53	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:46	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:56	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Sample Description: DUP Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989335
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TAFD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
GC/MS Volatiles SW-846 8260B ug/l ug/l					
10943	Benzene	71-43-2	N.D.	0.5	1
10943	Ethylbenzene	100-41-4	N.D.	0.5	1
10943	Toluene	108-88-3	N.D.	0.5	1
10943	Xylene (Total)	1330-20-7	N.D.	0.5	1
GC/MS Semivolatiles SW-846 8270C SIM ug/l ug/l					
08357	Acenaphthene	83-32-9	N.D.	0.0096	1
08357	Acenaphthylene	208-96-8	N.D.	0.0096	1
08357	Anthracene	120-12-7	N.D.	0.0096	1
08357	Benzo(a)anthracene	56-55-3	N.D.	0.0096	1
08357	Benzo(a)pyrene	50-32-8	N.D.	0.0096	1
08357	Benzo(b)fluoranthene	205-99-2	N.D.	0.0096	1
08357	Benzo(g,h,i)perylene	191-24-2	N.D.	0.0096	1
08357	Benzo(k)fluoranthene	207-08-9	N.D.	0.0096	1
08357	Chrysene	218-01-9	N.D.	0.0096	1
08357	Dibenz(a,h)anthracene	53-70-3	N.D.	0.0096	1
08357	Fluoranthene	206-44-0	N.D.	0.0096	1
08357	Fluorene	86-73-7	N.D.	0.0096	1
08357	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.0096	1
08357	Naphthalene	91-20-3	0.039	0.029	1
08357	Phenanthrene	85-01-8	N.D.	0.029	1
08357	Pyrene	129-00-0	N.D.	0.0096	1

The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary. The following corrective action was taken:
 The sample was re-extracted outside the method required holding time and the QC is again outside of the acceptance limits. The data is reported from the initial trial.

GC Volatiles ECY 97-602 NWTPH-Gx ug/l ug/l					
08273	NWTPH-Gx water C7-C12	n.a.	N.D.	50	1

GC Petroleum ECY 97-602 NWTPH-Dx ug/l ug/l					
Hydrocarbons w/Si modified					
02211	DRO C12-C24 w/Si Gel	n.a.	N.D.	29	1
12005	DRO C12-C24 w/Si Gel	n.a.	N.D.	29	1
02211	HRO C24-C40 w/Si Gel	n.a.	120	69	1
12005	HRO C24-C40 w/Si Gel	n.a.	N.D.	69	1

The reverse surrogate, capric acid, is present at <1%.

Metals SW-846 6010B ug/l ug/l					
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	75.9	0.33	1
07049	Cadmium	7440-43-9	1.0	0.36	1
07051	Chromium	7440-47-3	6.0	1.1	1
01754	Iron	7439-89-6	14,900	33.3	1
07058	Manganese	7439-96-5	1,130	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1

Sample Description: DUP Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989335
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TAFD

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals					
06035	Lead	SW-846 6020 7439-92-1	ug/l 13.8	ug/l 0.073	1
00259	Mercury	SW-846 7470A 7439-97-6	ug/l 0.20	ug/l 0.070	1
Wet Chemistry					
12150	Total Alkalinity	SM 2320 B-1997 n.a.	ug/l as CaCO3 32,200	ug/l as CaCO3 700	1
12149	Bicarbonate Alkalinity	n.a.	32,200	700	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997 n.a.	ug/l 6,400	ug/l 700	1
12152	pH	SM 4500-H+ B-2000 n.a.	Std. Units 7.0	Std. Units 0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10943	BTEX 8260B Water	SW-846 8260B	1	F130842AA	03/25/2013 09:56	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F130842AA	03/25/2013 09:56	Anita M Dale	1
08357	PAHs in waters by SIM	SW-846 8270C SIM	1	13080WAE026	03/22/2013 10:20	Mark A Clark	1
10470	BNA Water Extraction (SIM)	SW-846 3510C	1	13080WAE026	03/21/2013 16:00	Seth A Farrier	1
08273	NWTPH-Gx water C7-C12	ECY 97-602 NWTPH-Gx	1	13079C20A	03/22/2013 04:36	Laura M Krieger	1
01146	GC VOA Water Prep	SW-846 5030B	1	13079C20A	03/22/2013 04:36	Laura M Krieger	1
12005	NWTPH-Dx water w/ 10g Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800026A	03/28/2013 02:34	Lisa A Reinert	1
02211	NWTPH-Dx water w/Si Gel	ECY 97-602 NWTPH-Dx modified	1	130800025A	03/29/2013 13:16	Lisa A Reinert	1
02135	Extraction - DRO Water Special	ECY 97-602 NWTPH-Dx 06/97	1	130800025A	03/22/2013 10:00	Elizabeth A Sholder	1
12007	NW Dx water w/ 10g column	ECY 97-602 NWTPH-Dx 06/97	1	130800026A	03/22/2013 10:00	Elizabeth A Sholder	1
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1

Sample Description: DUP Grab Water
Facility# 1001838 Job# 385864
10 5th Street - Astoria, OR

LLI Sample # WW 6989335
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

5TAFD

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 10:04	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:47	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713004	03/22/2013 10:41	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713004	03/21/2013 16:20	Nelli S Markaryan	1
12150	Total Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:47	Clayton C Litchmore	1
12149	Bicarbonate Alkalinity	SM 2320 B-1997	2	13079002208A	03/21/2013 01:47	Clayton C Litchmore	1
00238	Free Carbon Dioxide	SM 4500-CO2 D-1997	1	13079002208A	03/26/2013 12:50	Clayton C Litchmore	1
12152	pH	SM 4500-H+ B-2000	2	13079002208A	03/21/2013 01:47	Clayton C Litchmore	1

Sample Description: DUP Filtered Grab Water
Facility# 1001838 **Job#** 385864
 10 5th Street - Astoria, OR

LLI Sample # WW 6989336
LLI Group # 1376662
Account # 11928

Project Name: 1001838

Collected: 03/14/2013 by GM

Chevron

L4310

Submitted: 03/19/2013 21:00

6001 Bollinger Canyon Rd.

Reported: 03/30/2013 09:45

San Ramon CA 94583

CAT No.	Analysis Name	CAS Number	As Received Result	As Received Method Detection Limit	Dilution Factor
Metals Dissolved			ug/l	ug/l	
07035	Arsenic	7440-38-2	N.D.	6.8	1
07046	Barium	7440-39-3	20.4	0.33	1
07049	Cadmium	7440-43-9	N.D.	0.36	1
07051	Chromium	7440-47-3	N.D.	1.1	1
01754	Iron	7439-89-6	777	33.3	1
07058	Manganese	7439-96-5	51.5	0.83	1
07036	Selenium	7782-49-2	N.D.	7.5	1
07066	Silver	7440-22-4	N.D.	1.2	1
SW-846 6010B			ug/l	ug/l	
06035	Lead	7439-92-1	0.79	0.073	1
SW-846 6020			ug/l	ug/l	
00259	Mercury	7439-97-6	N.D.	0.070	1

General Sample Comments

This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07035	Arsenic	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
07046	Barium	SW-846 6010B	1	130801848008	03/26/2013 13:53	Joanne M Gates	1
07049	Cadmium	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
07051	Chromium	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
01754	Iron	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
07058	Manganese	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
07036	Selenium	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
07066	Silver	SW-846 6010B	1	130801848008	03/25/2013 10:07	Eric L Eby	1
06035	Lead	SW-846 6020	1	130816050002A	03/25/2013 21:49	David K Beck	1
00259	Mercury	SW-846 7470A	1	130795713006	03/22/2013 11:58	Damary Valentin	1
01848	WW SW846 ICP Digest (tot rec)	SW-846 3005A	1	130801848008	03/24/2013 11:22	James L Mertz	1
06050	ICP/MS SW-846 Water Digest	SW-846 3010A modified	1	130816050002	03/24/2013 23:45	Annamaria Stipkovits	1
05713	WW SW846 Hg Digest	SW-846 7470A	1	130795713006	03/21/2013 15:25	Nelli S Markaryan	1

Quality Control Summary

Client Name: Chevron
Reported: 03/30/13 at 09:45 AM

Group Number: 1376662

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: F130841AA	Sample number(s): 6989320-6989321							
Benzene	N.D.	0.5	ug/l	91		77-121		
Ethylbenzene	N.D.	0.5	ug/l	92		79-120		
Methyl Tertiary Butyl Ether	N.D.	0.5	ug/l	96		68-121		
Toluene	N.D.	0.5	ug/l	90		79-120		
Xylene (Total)	N.D.	0.5	ug/l	91		77-120		
Batch number: F130842AA	Sample number(s): 6989323, 6989325-6989327, 6989333, 6989335							
Benzene	N.D.	0.5	ug/l	93		77-121		
Ethylbenzene	N.D.	0.5	ug/l	93		79-120		
Toluene	N.D.	0.5	ug/l	94		79-120		
Xylene (Total)	N.D.	0.5	ug/l	94		77-120		
Batch number: 13080WAE026	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335							
Acenaphthene	N.D.	0.010	ug/l	85		65-124		
Acenaphthylene	N.D.	0.010	ug/l	82		72-113		
Anthracene	N.D.	0.010	ug/l	85		70-117		
Benzo(a)anthracene	N.D.	0.010	ug/l	79		75-115		
Benzo(a)pyrene	N.D.	0.010	ug/l	80		72-120		
Benzo(b)fluoranthene	N.D.	0.010	ug/l	87		74-130		
Benzo(g,h,i)perylene	N.D.	0.010	ug/l	81		63-121		
Benzo(k)fluoranthene	N.D.	0.010	ug/l	74		74-118		
Chrysene	N.D.	0.010	ug/l	72*		75-112		
Dibenz(a,h)anthracene	N.D.	0.010	ug/l	85		66-122		
Fluoranthene	N.D.	0.010	ug/l	84		73-116		
Fluorene	N.D.	0.010	ug/l	67*		74-115		
Indeno(1,2,3-cd)pyrene	N.D.	0.010	ug/l	88		66-122		
Naphthalene	N.D.	0.030	ug/l	82		67-118		
Phenanthrene	N.D.	0.030	ug/l	80		72-109		
Pyrene	N.D.	0.010	ug/l	75		71-116		
Batch number: 13079C20A	Sample number(s): 6989320-6989321, 6989323, 6989325-6989327, 6989333, 6989335							
NWTPH-Gx water C7-C12	N.D.	50.	ug/l	94		75-135		
Batch number: 130850001A	Sample number(s): 6989325-6989327, 6989333							
Methane	N.D.	3.0	ug/l	113		80-120		
Batch number: 130800025A	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335							
DRO C12-C24 w/Si Gel	N.D.	30.	ug/l	76		32-117		
HRO C24-C40 w/Si Gel	N.D.	70.	ug/l					
Batch number: 130800026A	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335							
DRO C12-C24 w/Si Gel	N.D.	30.	ug/l	65		32-117		
HRO C24-C40 w/Si Gel	N.D.	70.	ug/l					

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron

Group Number: 1376662

Reported: 03/30/13 at 09:45 AM

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 130795713004 Mercury	Sample number(s): 6989321, 6989323, 6989325-6989328, N.D.	0.070	ug/l	84		6989333, 6989335 80-120		
Batch number: 130795713006 Mercury	Sample number(s): 6989322, 6989324, 6989329-6989332, N.D.	0.070	ug/l	89		6989334, 6989336 80-120		
Batch number: 130801848007 Arsenic	Sample number(s): 6989321-6989328 N.D.	6.8	ug/l	96		80-120		
Barium	N.D.	0.33	ug/l	101		90-110		
Cadmium	N.D.	0.36	ug/l	101		90-112		
Chromium	N.D.	1.1	ug/l	101		90-110		
Iron	N.D.	33.3	ug/l	100		90-112		
Manganese	N.D.	0.83	ug/l	101		90-110		
Selenium	N.D.	7.5	ug/l	101		80-120		
Silver	N.D.	1.2	ug/l	85		80-120		
Batch number: 130801848008 Arsenic	Sample number(s): 6989329-6989336 N.D.	6.8	ug/l	104		80-120		
Barium	N.D.	0.33	ug/l	97		90-110		
Cadmium	N.D.	0.36	ug/l	100		90-112		
Chromium	N.D.	1.1	ug/l	101		90-110		
Iron	N.D.	33.3	ug/l	99		90-112		
Manganese	N.D.	0.83	ug/l	100		90-110		
Selenium	N.D.	7.5	ug/l	98		80-120		
Silver	N.D.	1.2	ug/l	104		80-120		
Batch number: 130806050001A Lead	Sample number(s): 6989321-6989328 N.D.	0.073	ug/l	97		90-115		
Batch number: 130816050002A Lead	Sample number(s): 6989329-6989336 N.D.	0.073	ug/l	101		90-115		
Batch number: 13079002208A Total Alkalinity	Sample number(s): 6989321, 6989325-6989328, 6989333, 6989335 N.D.	700.	ug/l as CaCO3	94		90-110		
pH				100		99-103		
Batch number: 13079002208B Total Alkalinity	Sample number(s): 6989323 N.D.	700.	ug/l as CaCO3	94		90-110		
pH				100		99-103		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: F130841AA Benzene	Sample number(s): 6989320-6989321 UNSPK: 6989321 99	100	72-134	1	30				
Ethylbenzene	99	100	71-134	1	30				

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron
Reported: 03/30/13 at 09:45 AM

Group Number: 1376662

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>BKG</u> <u>MAX</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Methyl Tertiary Butyl Ether	104	102	72-126	2	30			
Toluene	97	98	80-125	1	30			
Xylene (Total)	99	99	79-125	0	30			
Batch number: F130842AA	Sample number(s): 6989323, 6989325-6989327, 6989333, 6989335 UNSPK: 6989325							
Benzene	97	101	72-134	4	30			
Ethylbenzene	94	99	71-134	5	30			
Toluene	95	98	80-125	3	30			
Xylene (Total)	95	100	79-125	5	30			
Batch number: 13080WAE026	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335 UNSPK: 6989325							
Acenaphthene	84	79	59-127	5	30			
Acenaphthylene	80	77	33-146	4	30			
Anthracene	91	88	69-119	3	30			
Benzo(a)anthracene	75	75	67-124	0	30			
Benzo(a)pyrene	69	70	64-123	1	30			
Benzo(b)fluoranthene	73	73	61-133	1	30			
Benzo(g,h,i)perylene	71	72	36-138	2	30			
Benzo(k)fluoranthene	65	70	59-128	7	30			
Chrysene	67	67	62-118	0	30			
Dibenz(a,h)anthracene	75	77	32-141	3	30			
Fluoranthene	83	84	65-123	2	30			
Fluorene	73	71	69-124	3	30			
Indeno(1,2,3-cd)pyrene	73	75	29-143	2	30			
Naphthalene	83	80	58-131	3	30			
Phenanthrene	86	84	67-117	2	30			
Pyrene	72	72	59-125	0	30			
Batch number: 13079C20A	Sample number(s): 6989320-6989321, 6989323, 6989325-6989327, 6989333, 6989335 UNSPK: 6989325							
NWTPH-Gx water C7-C12	75	85	75-135	11	30			
Batch number: 130850001A	Sample number(s): 6989325-6989327, 6989333 UNSPK: 6989325							
Methane	-3489 (2)	-3526 (2)	35-157	1	20			
Batch number: 130800025A	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335 UNSPK: 6989325							
DRO C12-C24 w/Si Gel	80	92	60-120	7	20			
Batch number: 130800026A	Sample number(s): 6989321, 6989323, 6989325-6989327, 6989333, 6989335 UNSPK: 6989325							
DRO C12-C24 w/Si Gel	72	65	60-120	11	20			
Batch number: 130795713004	Sample number(s): 6989321, 6989323, 6989325-6989328, 6989333, 6989335 UNSPK: 6989325							
Mercury	109	91	80-120	14	20	0.36	0.50	31* (1) 20
Batch number: 130795713006	Sample number(s): 6989322, 6989324, 6989329-6989332, 6989334, 6989336 UNSPK: 6989329							
Mercury	82	82	80-120	1	20	0.12	0.15	18 (1) 20
Batch number: 130801848007	Sample number(s): 6989321-6989328 UNSPK: 6989325 BKG: 6989325							
Arsenic	100	99	81-123	0	20	N.D.	N.D.	0 (1) 20

*- Outside of specification

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- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron
Reported: 03/30/13 at 09:45 AM

Group Number: 1376662

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u>	<u>MSD</u>	<u>MS/MSD</u>	<u>RPD</u>	<u>BKG</u>	<u>DUP</u>	<u>DUP</u>	<u>Dup</u>	<u>RPD</u>
	<u>%REC</u>	<u>%REC</u>	<u>Limits</u>	<u>RPD</u>	<u>MAX</u>	<u>Conc</u>	<u>Conc</u>	<u>RPD</u>	<u>Max</u>
Barium	102	103	78-118	1	20	209	228	9	20
Cadmium	96	97	83-116	1	20	0.66	0.82	22* (1)	20
Chromium	104	103	81-120	1	20	32.0	33.3	4 (1)	20
Iron	539 (2)	291 (2)	75-125	2	20	97,200	100,000	3	20
Manganese	113	108	75-125	2	20	517	539	4	20
Selenium	100	101	75-125	1	20	N.D.	N.D.	0 (1)	20
Silver	82	82	75-125	0	20	N.D.	N.D.	0 (1)	20
Batch number: 130801848008									
Sample number(s): 6989329-6989336 UNSPK: 6989329 BKG: 6989329									
Arsenic	103	100	81-123	3	20	N.D.	N.D.	0 (1)	20
Barium	97	96	78-118	1	20	101	99.2	2	20
Cadmium	98	96	83-116	2	20	0.87	0.74	16 (1)	20
Chromium	101	100	81-120	0	20	1.7	2.4	36* (1)	20
Iron	-51 (2)	-45 (2)	75-125	0	20	32,400	31,900	2	20
Manganese	93	94	75-125	0	20	562	551	2	20
Selenium	100	98	75-125	2	20	N.D.	N.D.	0 (1)	20
Silver	105	104	75-125	0	20	N.D.	N.D.	0 (1)	20
Batch number: 130806050001A									
Sample number(s): 6989321-6989328 UNSPK: 6989325 BKG: 6989325									
Lead	109	127*	83-120	6	20	27.5	28.7	4	20
Batch number: 130816050002A									
Sample number(s): 6989329-6989336 UNSPK: 6989329 BKG: 6989329									
Lead	100	102	83-120	2	20	0.81	0.83	2 (1)	20
Batch number: 13079002208A									
Sample number(s): 6989321,6989325-6989328,6989333,6989335 UNSPK: 6989325 BKG: 6989325									
Total Alkalinity	90	87	73-121	2	5	82,400	81,100	2	5
pH						6.7	6.8	0	3
Batch number: 13079002208B									
Sample number(s): 6989323 UNSPK: 6989325 BKG: 6989323									
Total Alkalinity	90	87	73-121	2	5	91,300	91,600	0	5
pH						6.9	6.9	0	3

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: UST VOCs by 8260B - Water
Batch number: F130841AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6989320	104	99	99	96
6989321	105	101	99	99
Blank	105	98	99	97
LCS	104	99	98	99
MS	103	100	99	100
MSD	104	100	99	99

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron
Reported: 03/30/13 at 09:45 AM

Group Number: 1376662

Surrogate Quality Control

Limits: 80-116 77-113

80-113 78-113

Analysis Name: UST VOCs by 8260B - Water
Batch number: F130842AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
6989323	103	98	97	97
6989325	103	97	99	98
6989326	102	104	97	101
6989327	103	98	96	99
6989333	104	99	98	98
6989335	103	98	97	95
Blank	102	97	99	97
LCS	105	98	100	101
MS	102	104	97	101
MSD	103	98	96	99

Limits: 80-116

77-113

80-113

78-113

Analysis Name: PAHs in waters by SIM
Batch number: 13080WAE026

	Fluoranthene-d10	Benzo(a)pyrene-d12	1-Methylnaphthalene-d10
6989321	100	99	104
6989323	107	101	107
6989325	76	72	80
6989326	106	99	111
6989327	111	101	108
6989333	106	104	106
6989335	101	98	106
Blank	101	108	100
LCS	102	110	104
MS	106	99	111
MSD	111	101	108

Limits: 64-120

62-141

58-134

Analysis Name: NWTPH-Gx water C7-C12
Batch number: 13079C20A

	Trifluorotoluene-F
6989320	83
6989321	83
6989323	85
6989325	86
6989326	99
6989327	100
6989333	84
6989335	84
Blank	83
LCS	106
MS	99
MSD	100

Limits: 63-135

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Quality Control Summary

Client Name: Chevron
Reported: 03/30/13 at 09:45 AM

Group Number: 1376662

Surrogate Quality Control

Analysis Name: NWTPH-Dx water w/Si Gel
Batch number: 130800025A
Orthoterphenyl

6989321	99
6989323	88
6989325	92
6989326	69
6989327	69
6989333	104
6989335	95
Blank	104
LCS	96
MS	69
MSD	69

Limits: 50-150

Analysis Name: NWTPH-Dx water w/ 10g Si Gel
Batch number: 130800026A
Orthoterphenyl

6989321	84
6989323	76
6989325	80
6989326	78
6989327	75
6989333	90
6989335	80
Blank	95
LCS	91
MS	78
MSD	75

Limits: 50-150

Analysis Name: Volatile Headspace Hydrocarbon
Batch number: 130850001A
Propene

6989325	99
6989326	58
6989327	58
6989333	96
Blank	98
LCS	98
MS	58
MSD	58

Limits: 42-131

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

Chevron Northwest Region Analysis Request/Chain of Custody



Please bring the lab results directly to the Lead Consultant and cc: G-R.

AMENDED

For Lancaster Laboratories use only
 Acct. #: 11928 Group # 1376662 Sample #: 6989320-36

Facility #: <u>SS#1001838 OML G-R#385864</u> Site Address: <u>10 5th Street, ASTORIA, OR</u> Chevron PM: <u>MH</u> Lead Consultant: <u>A</u> Consultant/Office: <u>G-R, Inc., 6747 Sierra Court, Suite J, Dublin, CA 94568</u> Consultant Prj. Mgr.: <u>Deanna L. Harding (deanna@grinc.com)</u> Consultant Phone #: <u>925-551-7555</u> Fax #: <u>925-551-7899</u> Sampler: <u>GILBERT MEDINA</u>			Matrix <input type="checkbox"/> Potable <input type="checkbox"/> NPDES <input type="checkbox"/> Soil <input type="checkbox"/> Water <input type="checkbox"/> Oil <input type="checkbox"/> Air <input type="checkbox"/>			Analyses Requested Preservation Codes <input type="checkbox"/> BTEX + MTBE 8021 <input type="checkbox"/> 8260 <input type="checkbox"/> Naphth <input type="checkbox"/> H <input checked="" type="checkbox"/> BTEX (3260) <input checked="" type="checkbox"/> Organics (AHS/3200sim) <input type="checkbox"/> NWTPH LX <input type="checkbox"/> NWTPH DX w/KGC COLUMN <input type="checkbox"/> NWTPH DX <input type="checkbox"/> Silica Gel Cleanup <input checked="" type="checkbox"/> Lead Total <input checked="" type="checkbox"/> Diss. <input type="checkbox"/> Method 6022 <input type="checkbox"/> WAPPH <input type="checkbox"/> WAEPH <input type="checkbox"/> NWTPH HClID <input type="checkbox"/> quantification <input type="checkbox"/> FREE (CARBON SULFIDE) (MAD 4502-CR2) <input type="checkbox"/> METHANE (PSE - 175) <input type="checkbox"/> TOTAL METAL (GROSS) (FAS) (P) <input type="checkbox"/> MERCURY (GROSS) (FAS) (P) <input type="checkbox"/> TOTAL MERCURY (NET) (FAS) (P) <input type="checkbox"/> MERCURY (NET) (FAS) (P)										SCR #: _____ <input type="checkbox"/> Results in Dry Weight <input type="checkbox"/> J value reporting needed <input type="checkbox"/> Must meet lowest detection limits possible for 8260 compounds <input type="checkbox"/> 8021 MTBE Confirmation <input type="checkbox"/> Confirm MTBE + Naphthalene <input type="checkbox"/> Confirm highest hit by 8260 <input type="checkbox"/> Confirm all hits by 8260 <input type="checkbox"/> Run ___ oxy's on highest hit <input type="checkbox"/> Run ___ oxy's on all hits																											
Sample Identification			Date Collected	Time Collected	Grab	Composite	Soil	Water	Oil	Air	Total Number of Containers	BTEX + MTBE 8021	8260	Naphth	H	NWTPH LX	NWTPH DX w/KGC COLUMN	NWTPH DX <input type="checkbox"/> Silica Gel Cleanup	Lead Total	Diss. <input type="checkbox"/> Method 6022	WAPPH	WAEPH	NWTPH HClID	quantification	FREE (CARBON SULFIDE) (MAD 4502-CR2)	METHANE (PSE - 175)	TOTAL METAL (GROSS) (FAS) (P)	MERCURY (GROSS) (FAS) (P)	TOTAL MERCURY (NET) (FAS) (P)	MERCURY (NET) (FAS) (P)													
	QA		3/14/17		X			W			2	X			X																												
	MW-6			0810							13	X	X			X	X							X		X																	
	MW-16			0940							14																																
	MW-20			1220							15																																
	MW-2C			1045							12																																
	DUP										12																																
	MW-20 MS/MCD			1220							30																																
Comments /Remarks Metals include: Fe, As, Se, Ba, Cd, Cr, Mn, Ag, Hg. Requesting both 1 gram and 10 grams of silica gel on NWTPH-Dx w/sgc samples, report both results added collection times for MW-20 to ms/mcd PM 3/17/20																																											
Turnaround Time Requested (TAT) (please circle) STD. TAT <u>72 hour</u> 48 hour 24-hour 4 day 5 day												Relinquished by: _____ Date: <u>3/15/17</u> Time: <u>0900</u> Relinquished by: _____ Date: _____ Time: _____ Relinquished by: _____ Date: _____ Time: _____ Relinquished by Commercial Carrier: _____ UPS FedEx Other _____ Temperature Upon Receipt _____ C°												Received by: _____ Date: <u>3/18/17</u> Time: <u>1330</u> Received by: _____ Date: <u>3/18/17</u> Time: <u>1330</u> Received by: _____ Date: _____ Time: _____ Received by: _____ Date: _____ Time: _____ Custody Seals Intact? Yes No																			
Data Package Options (please circle if required) EDF/EDD QC Summary Type I - Full Type VI (Raw Data)																																											

Lancaster Laboratories, Inc., 2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 (717) 656-2300
 Copies: White and yellow should accompany samples to Lancaster Laboratories. The pink copy should be retained by the client.

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m3	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
>	greater than		
J	estimated value – The result is \geq the Method Detection Limit (MDL) and $<$ the Limit of Quantitation (LOQ).		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter of gas per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

U.S. EPA CLP Data Qualifiers:

Organic Qualifiers	Inorganic Qualifiers
A TIC is a possible aldol-condensation product	B Value is $<$ CRDL, but \geq IDL
B Analyte was also detected in the blank	E Estimated due to interference
C Pesticide result confirmed by GC/MS	M Duplicate injection precision not met
D Compound quantitated on a diluted sample	N Spike sample not within control limits
E Concentration exceeds the calibration range of the instrument	S Method of standard additions (MSA) used for calculation
N Presumptive evidence of a compound (TICs only)	U Compound was not detected
P Concentration difference between primary and confirmation columns $>$ 25%	W Post digestion spike out of control limits
U Compound was not detected	* Duplicate analysis not within control limits
X,Y,Z Defined in case narrative	+ Correlation coefficient for MSA $<$ 0.995

Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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