



2022 GROUNDWATER MONITORING REPORT: NONENE LOADING RACK HOLLYFRONTIER PUGET SOUND REFINERY

prepared for:

HollyFrontier Puget Sound Refining LLC
8505 South Texas Rd.
Anacortes, WA 98221

June 16, 2022



*soil • water • air
compliance solutions*

228 East Champion Street, Suite 101, Bellingham, WA 98225
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**2022 GROUNDWATER MONITORING
REPORT
NONENE LOADING RACK
HOLLYFRONTIER
PUGET SOUND REFINERY**

prepared for:

HollyFrontier Puget Sound Refining LLC
8505 South Texas Rd.
Anacortes, WA 98221



prepared by:

Whatcom Environmental Services
228 East Champion Street, Suite 101
Bellingham, WA 98225

June 16, 2022

A handwritten signature in black ink, appearing to read "Ava Gempler".

Ava Gempler
Project Manager

A handwritten signature in black ink, appearing to read "Eric Libolt".

Eric Libolt
QA/QC Reviewer

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1.0 INTRODUCTION

A release of nonene to the ground occurred at the HollyFrontier Puget Sound Refining, LLC (HFPSR) nonene loading rack on October 23, 2011. A clogged oily water sewer drain caused the nonene to overflow the loading rack drainage sump. The nonene overflowed into the surrounding rail line ballast-rock. The nonene release location is shown on Figure 1.

The release and subsequent site characterization work was documented in a report prepared by Whatcom Environmental Services for Shell Puget Sound Refinery dated January 11, 2012 (WES, 2012a). Annual Groundwater Monitoring Reports summarizing the groundwater conditions at the site in 2012 through 2021 were completed and submitted to the client (WES, 2012b; WES, 2014; WES, 2015(2); WES, 2016; WES, 2017; WES, 2018; WES, 2019; WES, 2020; WES, 2021).

On February 10, 2015, the Washington State Department of Ecology (Ecology) submitted a letter to the client following their review of the annual 2014 summary document that stated that the monitoring frequency of the site may be reduced to annual from quarterly (Ecology, 2015). The letter from Ecology is included in Appendix A.

The annual groundwater sample was collected on February 28, 2022. This report documents the 2022 groundwater monitoring results and should be used in conjunction with the previous reports to document the condition of groundwater at the nonene loading rack release site.

Gasoline and diesel range total petroleum hydrocarbons (TPH) were detected in groundwater at the site in 2022. The laboratory analytical results showed that groundwater concentrations of diesel range contaminants, gasoline range contaminants, and BTEX constituents (benzene, toluene, ethylbenzene, and total xylenes) were below the applicable MTCA Method A target groundwater cleanup levels.

2.0 SITE DESCRIPTION

The HFPSR site is located at 8505 South Texas Road in Anacortes, Washington on March Point. The property is zoned for heavy industry. The site is located in the northwest quarter of the northwest quarter of Section 4 in Township 34 North, Range 2 east. Mr. Jim Schneider is the facility contact for the site (360) 293-0868.

2.1 SURROUNDING AREA AND SITE TOPOGRAPHY

The HFPSR site is bordered on the north by North Texas Road and the Tesoro Refinery, on the east by East March Point Road, on the south by South Texas Road, and on the west by West March Point Road. Fidalgo Bay is located approximately 0.25 miles west of the site and Padilla Bay is located approximately 1.25 miles to the east. The city of Anacortes, Washington is located approximately 3.75 miles to the northwest of the site.

The median elevation of the nonene loading rack site is approximately 70 feet above mean sea level. The site generally slopes towards the west but is made up of two relatively level areas; one approximately 75 feet above sea level (loading rack), and the other approximately 65 feet above sea level (monitoring well location).

2.2 SITE GEOLOGY

The subject property is located in the northern portion of the Puget Sound Basin. The region is characterized by thick sequences of Pleistocene glacial advance outwash and meltwater deposits that were deposited on a basement of tectonically deformed ancient sedimentary and metamorphic bedrock. The glacial deposits have been reworked by more recent fluvial, lacustrine, and aeolian actions into the landforms present today.

The HFPSR site is underlain by glacial till of the Vashon Stade (WDNR, 2000). The till consists of dense, unsorted diamicton which includes clast sizes ranging from boulders to clay. The unit contains localized areas of laminated silt and fine sand. Smaller clasts are generally subangular to rounded while boulders tend to be polished, faceted and striated. The unit ranges in color from gray and olive-gray to brown and yellowish-

brown, depending on lithologic content and oxidation state. The thickness of the unit is from less than 1 meter to a maximum of approximately 25 meters.

2.3 SITE HYDROLOGY

A groundwater monitoring well (W-129) was installed at the site in November 2011 at the location shown on Figure 1. Groundwater was first encountered at approximately 16 feet below ground surface (bgs). All cuttings and split-spoon samples appeared dry to moist above that depth. Following completion of the well, groundwater levels gradually rose to approximately 1 foot below the ground surface in the well. This may indicate that the well was completed in a confined aquifer as soils did not appear to be saturated during the drilling of the well until the well reached approximately 16 feet in depth.

Based on numerous groundwater wells and historic groundwater studies conducted at the HFPSR site, the general direction of groundwater flow follows the topography and flows to the west/southwest on the west side of March Point.

3.0 GROUNDWATER SAMPLING

One groundwater sample was collected from monitoring well W-129 on February 28, 2022. The groundwater sample was analyzed at Eurofins Environment Testing Northwest (formerly TestAmerica) environmental laboratory for diesel range TPH using method NWTPH-Dx, gasoline range TPH using method NWTPH-Gx, and BTEX constituents using method EPA-8260.

Prior to each sampling event, the depth to water in well W-129 was measured from the top of the PVC well casing with an electronic well probe and recorded in the field notebook. The depth to water recorded in 2022 is presented on Table 1. The groundwater sample was collected using a low-flow sampling procedure in accordance with EPA sampling guidelines (EPA, 2017). A YSI 556 multi-parameter water quality meter was used to monitor the groundwater chemistry during well purging prior to sample collection. The groundwater sample was collected after groundwater chemistry parameters had stabilized. The final groundwater chemistry parameters representing stable groundwater conditions are summarized in Table 2.

The sample was collected in sample bottles provided by Eurofins and stored on ice in a cooler immediately following collection. All sample containers included a sample label indicating the sample identification, the project name, the sampling date and time, and the sampler's name. Standard industry protocols regarding sample preservation, chain-of-custody, and shipping were followed.

4.0 GROUNDWATER SAMPLING RESULTS

Groundwater analytical data are summarized in Table 1. Stable groundwater chemistry parameters recorded prior to sample collection are presented in Table 2. The original groundwater laboratory analytical data reports are included in Appendix B.

Gasoline range TPH was detected in the groundwater during the sampling event in 2022. Gasoline range TPH was detected at a concentration of 480 µg/L, which is below the MTCA Method A target cleanup level for gasoline range TPH without the presence of benzene or other BTEX constituents.

Diesel range TPH was detected in the groundwater during the sampling event in 2022. Diesel range TPH was detected at a concentration of 140 µg/L, which is below the MTCA Method A target cleanup level for diesel range TPH. Oil range TPH was not detected in the groundwater during the 2022 sampling event.

No BTEX constituents were detected in 2022 at concentrations exceeding the laboratory reporting limit.

5.0 CONCLUSIONS

One groundwater sample was collected from monitoring well W-129 in 2022 and analyzed for gasoline and diesel range TPH, and BTEX constituents. The laboratory analytical results indicated that concentrations of gasoline and diesel range TPH, as well as BTEX constituents, did not exceed the MTCA Method A target cleanup levels in 2022. The site is underlain by silt and clay which will limit the vertical migration of contamination.

6.0 LIMITATIONS

This environmental report is based on conditions that existed at the time the investigation was performed, and samples collected. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, ground instability, or groundwater fluctuations.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted environmental practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

This report has been prepared for use by HFPSR by Whatcom Environmental Services, Inc. Whatcom Environmental prepares a report for the client's exclusive use for a particular project and in accordance with generally accepted practices at the time of investigation. This report was prepared for exclusive use by the client and its agents and may not be used, relied upon, or assigned to a third party without written consent from Whatcom Environmental. This report is not intended for use by others, and the information contained herein is not applicable to other sites. This report may be made available to regulatory agencies.

7.0 REFERENCES

- U.S. Environmental Protection Agency, 2017 (rev. 4), Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells, EQASOP-GW4, <https://www.epa.gov/sites/default/files/2017-10/documents/eqasop-gw4.pdf>
- Washington State Department of Ecology. 2007. The Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC. Toxics Cleanup Program. Amended November 2007. Publication No. 94-06.
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- Washington State Department of Natural Resources (WDNR). 2000. Geologic Map of the Bellingham 1:100,000 Quadrangle, Washington. Open File Report 2000-5.
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- Whatcom Environmental Services, Inc. August 25, 2017 Groundwater Monitoring Report, Nonene Loading Rack, Shell Oil Products US, Puget Sound Refinery. Prepared for: Shell Oil Products US, Puget Sound Refinery.
- Whatcom Environmental Services, Inc. August 7, 2018 Groundwater Monitoring Report, Nonene Loading Rack, Shell Oil Products US, Puget Sound Refinery. Prepared for: Shell Oil Products US, Puget Sound Refinery.

Whatcom Environmental Services, Inc. August 30, 2019 Groundwater Monitoring Report, Nonene Loading Rack, Shell Oil Products US, Puget Sound Refinery.
Prepared for: Shell Oil Products US, Puget Sound Refinery.

Whatcom Environmental Services, Inc. August 24, 2020 Groundwater Monitoring Report, Nonene Loading Rack, Shell Oil Products US, Puget Sound Refinery.
Prepared for: Shell Oil Products US, Puget Sound Refinery.

Whatcom Environmental Services, Inc. October 12, 2021 Groundwater Monitoring Report, Nonene Loading Rack, Shell Oil Products US, Puget Sound Refinery.
Prepared for: Shell Oil Products US, Puget Sound Refinery.

122°38'0"W 122°36'0"W 122°34'0"W 122°32'0"W 122°30'0"W



Prepared for:



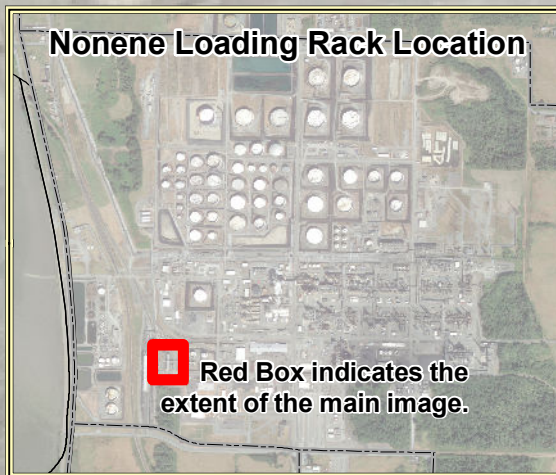
Prepared by:



Site Location Map

HollyFrontier
Nonene Loading Rack
05/06/2022

Figure 1



 Groundwater Monitoring Well	All data are approximate and should be used for relative location reference only. 2020 Aerial Photograph (GoogleEarth).	0 25 50 75 Feet 1 inch = 50 feet	
Prepared for:	Prepared by:	Well Location Map	
		Nonene Rack Release	Figure 2
		05/06/2022	

Table 1. Groundwater Sample Analytical Results - Nonene Loading Rack

Sample ID	Date	Depth to Water (ft below casing)	NWTPH-Dx	NWTPH-Dx	NWTPH-Gx	EPA-8260	EPA-8260	EPA-8260	EPA-8260
			Diesel Range	Lube-oil Range	Gasoline Range	Benzene	Toluene	Ethylbenzene	Xylenes
			(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
MTCA Method A Cleanup Levels			500	500	800/1000 ^a	5	1,000	700	1,000
NONENE (W-129)	12/5/11	*4.08	ND(<130)	ND(<250)	1,300	ND(<0.12)	ND(<0.20)	ND(<0.10)	ND(<0.91)
	3/21/12	3.83	750	ND(<240)	260	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	6/25/12	3.81	360	ND(<240)	420	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	9/18/12	5.64	230	ND(<240)	530	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	11/20/12	3.39	510	ND(<240)	570	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	2/19/13	3.69	660	ND(<240)	160	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	4/22/13	3.73	460	ND(<240)	92	ND(<0.5)	2.1	ND(<0.5)	ND(<1.0)
	7/31/13	5.07	130	ND(<240)	200	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<1.0)
	11/25/13	4.15	190	ND(<240)	510	ND(<1.0)	ND(<1.0)	ND(<1.0)	ND(<3.0)
	3/19/14	3.66	200	ND(<240)	510	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<2.0)
	6/11/14	4.90	190	ND(<240)	870	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<2.0)
	8/5/14	4.87	210	ND(<240)	820	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<2.0)
	11/11/14	4.02	150	ND(<260)	780	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<2.0)
	8/25/15	6.63	ND(<210)	ND(<480)	790	ND(<0.5)	ND(<0.5)	ND(<0.5)	ND(<2.0)
	8/10/16	5.93	ND(<120)	ND(<270)	410	ND(<2.0)	ND(<2.0)	ND(<3.0)	ND(<2.0)
	8/3/17	6.20	120	ND(<270)	470	ND(<0.4)	ND(<1.0)	ND(<1.0)	ND(<3.0)
	6/26/18	5.10	130	ND(<360)	590	ND(<3.0)	ND(<2.0)	ND(<3.0)	ND(<3.0)
	8/7/19	5.32	200	ND(<370)	130	ND(<3.0)	ND(<2.0)	ND(<3.0)	ND(<3.0)
	8/11/20	5.40	130	ND(<360)	640	ND(<3.0)	ND(<2.0)	ND(<3.0)	ND(<3.0)
	5/4/21	4.50	150	ND(<370)	1,200	ND(<0.2)	ND(<0.2)	ND(<0.2)	ND(<0.5)
	2/28/22	3.84	140	ND(<350)	480	ND(<1.0)	ND(<1.0)	ND(<1.0)	ND(<2.0)

^a - Cleanup level dependant on BTEX concentrations

ND - indicates analyte was not detected at level above the laboratory reporting limit (shown)

* - DTW collected on 12/7/11

Table 2. Groundwater Chemistry Parameters - Nonene Loading Rack

Sample ID	Date	Temperature (°C)	Electrical Conductivity (mS/cm)	Total Dissolved Solids (g/L)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (pH units)	Oxidation/Reduction Potential (mV)
NONENE (W-129)	12/5/11	11.77	0.577	0.375	0.28	0.60	7.95	64.50
	3/21/12	9.95	0.584	0.379	0.28	0.08	8.00	-22.60
	6/25/12	13.09	0.566	0.368	0.28	0.03	7.91	-46.80
	9/18/12*	--	--	--	--	--	--	--
	11/20/12	12.79	0.631	0.410	0.31	0.63	7.69	9.30
	2/19/13	10.24	0.584	0.380	0.29	0.02	7.60	-60.90
	4/22/13	11.30	0.587	0.381	0.29	0.02	7.70	-40.10
	7/31/13	15.26	0.577	0.375	0.28	0.01	7.83	-38.90
	11/25/13	12.62	0.640	0.416	0.31	0.56	7.97	66.00
	3/19/14	10.15	0.609	0.396	0.30	0.02	7.74	-18.70
	6/11/14	16.04	0.589	0.383	0.29	0.02	7.84	25.00
	8/5/14	15.17	0.625	0.406	0.31	0.61	8.15	11.70
	11/11/14	13.92	0.646	0.420	0.32	0.58	8.24	20.50
	8/25/15	17.31	0.595	0.387	0.29	0.63	7.75	113.10
	8/10/16	18.02	0.616	0.400	0.30	0.15	8.08	-90.90
	8/3/17	18.46	0.583	0.379	0.28	0.18	8.65	-18.80
	6/26/18	15.92	0.582	0.578	0.28	0.19	7.43	43.80
	8/7/19	16.67	0.640	0.416	0.31	0.12	7.81	-37.20
	8/11/20	17.73	0.617	0.401	0.30	0.27	7.53	-14.50
	5/4/21	12.93	0.623	0.405	0.30	0.65	7.39	8.40
	2/28/22	9.22	0.594	0.386	0.29	0.64	6.84	105.00

Data collected using a YSI 556 MPS water meter

* - Parameters not recorded due to meter error

APPENDIX A

Letter from Ecology granting permission for Annual Monitoring
February 10, 2015



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

February 10, 2015

Mr. Gary Barklind
Shell Oil Products US
8505 S. Texas Road
PO Box 622
Anacortes, WA 98221-0622

**Re: Ecology Review of 2014 Groundwater Monitoring Report: Nonene Loading Rack,
Shell Puget Sound Refinery**

Mr. Barklind:

The Washington State Department of Ecology (Ecology) has reviewed the 2014 Groundwater Monitoring Report: Nonene Loading Rack for the Shell Oil Puget Sound Refinery site. This report provides background on the release of nonene to the ground (rail line ballast rock) on October 21, 2011 and subsequent groundwater monitoring, including four rounds of monitoring in 2014. The release of nonene was characterized and then described in a 2012 Independent Remedial Action Report (IRAP) for the Nonene Loading Rack. The IRAP describes the analysis of two extractable and volatile soil samples that may pose a threat to human health and potable groundwater and the installation of one groundwater monitoring well.

Since the release of nonene in 2011, quarterly groundwater monitoring has been performed at one well (W-129) with analysis for petroleum hydrocarbons and BTEX. Results of the groundwater monitoring demonstrate a decreasing trend for diesel range hydrocarbons and only one exceedance of MTCA Method A cleanup levels for gasoline range hydrocarbons during the first round in 2011. There have been no BTEX exceedances.

Without additional soil sampling and analysis, Ecology assumes the soil remains at concentrations that may pose a threat to human health or potable groundwater. Ecology therefore agrees that the frequency of groundwater monitoring can be reduced from quarterly to an annual basis beginning the first quarter of 2015.

If you have any questions regarding this letter, please contact me at (360) 407-6999 or Guy.Barrett@ecy.wa.gov. Thank you.



Mr. Gary Barklind
February 10, 2015
Page 2 of 2

Sincerely,

A handwritten signature in black ink, appearing to read "Guy Barrett", with a long horizontal flourish extending to the right.

Guy Barrett, LHG
Site Manager
Industrial Section
Waste 2 Resources Program

cc: Mark Dirkx, Ecology
Kim Wigfield, Ecology

By Certified Mail # 91 7199 9991 7032 9431 7488

APPENDIX B

2022 Groundwater Sample Laboratory Analytical Data

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

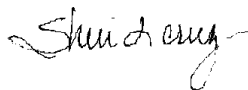
Laboratory Job ID: 580-110866-1

Client Project/Site: HFC: Nonene Loading Rack Site
Groundwater Monitori

For:

Whatcom Environmental Services Inc.
228 East Champion Street #101
Bellingham, Washington 98225

Attn: Eric Libolt



Authorized for release by:
3/14/2022 4:57:48 PM

Sheri Cruz, Project Manager I
(253)922-2310
Sheri.Cruz@Eurofinset.com

LINKS

Review your project
results through

TotalAccess

Have a Question?



Visit us at:

www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater Monito

Job ID: 580-110866-1

Job ID: 580-110866-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-110866-1

Comments

No additional comments.

Receipt

The samples were received on 3/1/2022 9:45 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8° C.

GC/MS VOA

Method 8260D: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 580-383290 recovered outside control limits for the following analytes: Benzene.

Method 8260D: The surrogate recovery for the blank associated with analytical batch 580-383290 was outside the upper control limits.

Method NWTPH-Gx: The continuing calibration verification (CCV) associated with batch 580-383288 recovered above the upper control limit for Gasoline. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: Trip Blanks (580-110866-2) and (CCV 580-383288/26).

Method NWTPH-Gx: CCV drift flag removed due to CCV not being a part of bracket associated with this sample. W-129 (580-110866-1)

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

GC Semi VOA

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

Organic Prep

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-383561, so a LCS/LCSD were created and substituted for the MS/MSD/DUP.

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

VOA Prep

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

Definitions/Glossary

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitors

Job ID: 580-110866-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
S1+	Surrogate recovery exceeds control limits, high biased.

Glossary

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

Client Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitori

Job ID: 580-110866-1

Client Sample ID: W-129

Lab Sample ID: 580-110866-1

Date Collected: 02/28/22 11:55

Matrix: Water

Date Received: 03/01/22 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND	*1	1.0		ug/L			03/09/22 18:28	1
Toluene	ND		1.0		ug/L			03/09/22 18:28	1
Ethylbenzene	ND		1.0		ug/L			03/09/22 18:28	1
m-Xylene & p-Xylene	ND		2.0		ug/L			03/09/22 18:28	1
o-Xylene	ND		1.0		ug/L			03/09/22 18:28	1
Xylenes, Total	ND		2.0		ug/L			03/09/22 18:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	85		80 - 120		03/09/22 18:28	1
1,2-Dichloroethane-d4 (Surr)	111		80 - 120		03/09/22 18:28	1
4-Bromofluorobenzene (Surr)	99		80 - 120		03/09/22 18:28	1
Dibromofluoromethane (Surr)	103		80 - 120		03/09/22 18:28	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	0.48		0.050		mg/L			03/10/22 22:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		77 - 123		03/10/22 22:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	0.14		0.11		mg/L		03/11/22 09:50	03/12/22 17:48	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		03/11/22 09:50	03/12/22 17:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	96		50 - 150	03/11/22 09:50	03/12/22 17:48	1

Client Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitori

Job ID: 580-110866-1

Client Sample ID: Trip Blanks

Lab Sample ID: 580-110866-2

Date Collected: 02/28/22 00:01

Matrix: Water

Date Received: 03/01/22 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND	*1	1.0		ug/L			03/09/22 18:54	1
Toluene	ND		1.0		ug/L			03/09/22 18:54	1
Ethylbenzene	ND		1.0		ug/L			03/09/22 18:54	1
m-Xylene & p-Xylene	ND		2.0		ug/L			03/09/22 18:54	1
o-Xylene	ND		1.0		ug/L			03/09/22 18:54	1
Xylenes, Total	ND		2.0		ug/L			03/09/22 18:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	87		80 - 120		03/09/22 18:54	1
1,2-Dichloroethane-d4 (Surr)	111		80 - 120		03/09/22 18:54	1
4-Bromofluorobenzene (Surr)	100		80 - 120		03/09/22 18:54	1
Dibromofluoromethane (Surr)	106		80 - 120		03/09/22 18:54	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.050		mg/L			03/09/22 18:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	100		77 - 123		03/09/22 18:54	1

QC Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitors

Job ID: 580-110866-1

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

Lab Sample ID: MB 580-383290/5

Matrix: Water

Analysis Batch: 383290

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/L			03/09/22 10:58	1
Toluene	ND		1.0		ug/L			03/09/22 10:58	1
Ethylbenzene	ND		1.0		ug/L			03/09/22 10:58	1
m-Xylene & p-Xylene	ND		2.0		ug/L			03/09/22 10:58	1
o-Xylene	ND		1.0		ug/L			03/09/22 10:58	1
Xylenes, Total	ND		2.0		ug/L			03/09/22 10:58	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	92		80 - 120					03/09/22 10:58	1
1,2-Dichloroethane-d4 (Surr)	110		80 - 120					03/09/22 10:58	1
4-Bromofluorobenzene (Surr)	111		80 - 120					03/09/22 10:58	1
Dibromofluoromethane (Surr)	123	S1+	80 - 120					03/09/22 10:58	1

Lab Sample ID: LCS 580-383290/8

Matrix: Water

Analysis Batch: 383290

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.44		ug/L		94	80 - 122
Toluene	10.0	9.85		ug/L		99	80 - 120
Ethylbenzene	10.0	9.94		ug/L		99	80 - 120
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	80 - 120
o-Xylene	10.0	9.42		ug/L		94	80 - 120
Xylenes, Total	20.0	19.6		ug/L		98	80 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	97		80 - 120				
1,2-Dichloroethane-d4 (Surr)	102		80 - 120				
4-Bromofluorobenzene (Surr)	102		80 - 120				
Dibromofluoromethane (Surr)	99		80 - 120				

Lab Sample ID: LCSD 580-383290/9

Matrix: Water

Analysis Batch: 383290

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	11.3	*1	ug/L		113	80 - 122	18	14
Toluene	10.0	10.4		ug/L		104	80 - 120	5	13
Ethylbenzene	10.0	10.7		ug/L		107	80 - 120	8	14
m-Xylene & p-Xylene	10.0	10.9		ug/L		109	80 - 120	6	14
o-Xylene	10.0	11.0		ug/L		110	80 - 120	15	16
Xylenes, Total	20.0	21.9		ug/L		110	80 - 120	11	16
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
Toluene-d8 (Surr)	106		80 - 120						
1,2-Dichloroethane-d4 (Surr)	105		80 - 120						

Eurofins Seattle

QC Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitori

Job ID: 580-110866-1

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

Lab Sample ID: LCSD 580-383290/9

Matrix: Water

Analysis Batch: 383290

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
4-Bromofluorobenzene (Surr)	105		80 - 120
Dibromofluoromethane (Surr)	110		80 - 120

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

Lab Sample ID: MB 580-383288/5

Matrix: Water

Analysis Batch: 383288

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.050		mg/L			03/09/22 10:58	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	111		77 - 123					03/09/22 10:58	1

Lab Sample ID: LCS 580-383288/6

Matrix: Water

Analysis Batch: 383288

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline	1.00	1.08		mg/L		108	55 - 148
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	103		77 - 123				

Lab Sample ID: LCSD 580-383288/7

Matrix: Water

Analysis Batch: 383288

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline	1.00	1.09		mg/L		109	55 - 148	1	10
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	107		77 - 123						

Lab Sample ID: MB 580-383518/5

Matrix: Water

Analysis Batch: 383518

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline	ND		0.050		mg/L			03/10/22 18:03	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	105		77 - 123					03/10/22 18:03	1

Eurofins Seattle

QC Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitors

Job ID: 580-110866-1

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

Lab Sample ID: LCS 580-383518/8

Matrix: Water

Analysis Batch: 383518

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

			Spike	LCS	LCS			%Rec.		
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	
Gasoline			1.00	1.03		mg/L		103	55 - 148	
			LCS	LCS						
Surrogate	%Recovery	Qualifier	Limits							
4-Bromofluorobenzene (Surr)	101		77 - 123							

Lab Sample ID: LCSD 580-383518/9

Matrix: Water

Analysis Batch: 383518

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

Analysis Data: 080910											
Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline			1.00	1.03		mg/L		103	55 - 148	0	10
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits								
4-Bromofluorobenzene (Surr)	103		77 - 123								

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

Lab Sample ID: MB 580-383561/1-A

Matrix: Water

Analysis Batch: 383668

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 383561

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
#2 Diesel (C10-C24)	ND		0.11		mg/L		03/11/22 09:50	03/12/22 15:27	1
Motor Oil (>C24-C36)	ND		0.35		mg/L		03/11/22 09:50	03/12/22 15:27	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	94		50 - 150				03/11/22 09:50	03/12/22 15:27	1

Lab Sample ID: LCS 580-383561/2-A

Matrix: Water

Analysis Batch: 383668

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 383561

			Spike	LCS	LCS					%Rec.	
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits		
#2 Diesel (C10-C24)			4.00	3.99		mg/L		100	50 - 120		
Motor Oil (>C24-C36)			4.00	4.35		mg/L		109	64 - 120		
			LCS	LCS							
Surrogate	%Recovery	Qualifier	Limits								
o-Terphenyl	84		50 - 150								

Lab Sample ID: LCSD 580-383561/3-A

Matrix: Water

Analysis Batch: 383668

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 383561

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
#2 Diesel (C10-C24)	4.00	3.80		mg/L		95	50 - 120	5	26
Motor Oil (>C24-C36)	4.00	4.27		mg/L		107	64 - 120	2	24

Eurofins Seattle

QC Sample Results

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitori

Job ID: 580-110866-1

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

Lab Sample ID: LCSD 580-383561/3-A

Matrix: Water

Analysis Batch: 383668

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 383561

	LCSD	LCSD	
Surrogate	%Recovery	Qualifier	Limits
<i>o</i> -Terphenyl	91		50 - 150

Lab Chronicle

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitors

Job ID: 580-110866-1

Client Sample ID: W-129

Date Collected: 02/28/22 11:55

Date Received: 03/01/22 09:45

Lab Sample ID: 580-110866-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	383290	03/09/22 18:28	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	383518	03/10/22 22:57	B1M	FGS SEA
Total/NA	Prep	3510C			383561	03/11/22 09:50	JJY	FGS SEA
Total/NA	Analysis	NWTPH-Dx		1	383668	03/12/22 17:48	JAE	FGS SEA

Client Sample ID: Trip Blanks

Date Collected: 02/28/22 00:01

Date Received: 03/01/22 09:45

Lab Sample ID: 580-110866-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260D		1	383290	03/09/22 18:54	B1M	FGS SEA
Total/NA	Analysis	NWTPH-Gx		1	383288	03/09/22 18:54	B1M	FGS SEA

Laboratory References:

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

Accreditation/Certification Summary

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitori

Job ID: 580-110866-1

Laboratory: Eurofins Seattle

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

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Sample Summary

Client: Whatcom Environmental Services Inc.
Project/Site: HFC: Nonene Loading Rack Site Groundwater
Monitors

Job ID: 580-110866-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-110866-1	W-129	Water	02/28/22 11:55	03/01/22 09:45
580-110866-2	Trip Blanks	Water	02/28/22 00:01	03/01/22 09:45

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Login Sample Receipt Checklist

Client: Whatcom Environmental Services Inc.

Job Number: 580-110866-1

Login Number: 110866

List Number: 1

Creator: Blankinship, Tom X

List Source: Eurofins Seattle

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