

February 12, 2021

Andrew Smith, Site Manager Department of Ecology PO Box 47775 Olympia, Washington 98504-7775

Subject: 2020 Groundwater Monitoring Report

NuStar Vancouver Annex Facility 5420 NW Fruit Valley Road Vancouver, Washington

0060-001-005

Dear Mr. Smith:

Enclosed, please find the *2020 Groundwater Monitoring Report* that has been prepared on behalf of NuStar Terminals Operations Partnership, L.P. (NuStar) by Cascadia Associates, LLC. (Cascadia). The enclosed report presents the results of four quarters of groundwater monitoring conducted in 2020 at the NuStar Vancouver Annex Facility.

If you have any questions or would like to discuss this further, please contact me at (503) 577-1535 or Stephanie Bosze Salisbury at (503) 807-3835.

Sincerely,

Amanda Spencer

Principal Hydrogeologist

les

Enclosure

2020 Groundwater Monitoring Report (electronic via email and 2 hard copies)

cc: Renee Robinson, NuStar Energy, L.P. (electronic deliverable)
Aaron Flett, NuStar Energy, L.P. (electronic deliverable)

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2020 Groundwater Monitoring Report NuStar Vancouver Annex Terminal 5420 NW Fruit Valley Road Vancouver, Washington

Prepared for:

NuStar Terminals Operations Partnership, L.P. 19003 IH-10 West San Antonio, Texas 78257

Prepared by:

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2020 Groundwater Monitoring Report NuStar Vancouver Annex Terminal 5420 NW Fruit Valley Road Vancouver, Washington

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NuStar Terminals Operations Partnership, L.P.
Project No. 0060-001-005
February 12, 2021

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1.0 INTRODUCTION

This groundwater monitoring report was prepared by Cascadia Associates, LLC (Cascadia) on behalf of NuStar Terminals Operations Partnership L.P. (NuStar) for groundwater monitoring conducted in 2020 at the NuStar Vancouver Annex Terminal located at 5420 NW Fruit Valley Road, Vancouver, Washington (the Facility). A location map for the Facility is provided on Figure 1; a site plan is provided on Figure 2.

On July 12, 2012, NuStar submitted a draft Feasibility Study (FS) to the Washington State Department of Ecology (Ecology) in accordance with Agreed Order (AO) No. 09-TC-S DE5250 between Ecology and NuStar (Ash Creek, 2012). The technical basis of the FS was the Remedial Investigation (RI) and Risk Assessment (RA) documented in the *Remedial Investigation and Risk Assessment Report* (RI/RA Report) submitted to Ecology in December 2010 (Ash Creek, 2010) and approved by Ecology on June 23, 2011. The draft FS proposed monitored natural attenuation to address residual hydrocarbon constituents in groundwater in the eastern portion of the Facility. On October 16, 2013, Ecology provided NuStar with comments on the draft FS. In the months following receipt, NuStar held several meetings with Ecology to discuss Ecology's comments on the FS, as well as additional comments that were presented to NuStar in a February 4, 2014 meeting. The meetings culminated in a Final Project Coordinator's Decision (the "Decision") issued by Ecology on August 26, 2014, which established a series of steps for collecting additional data to support submittal of a revised FS.

Between 2014 and 2020, multiple soil and groundwater investigations were conducted as part of the Supplemental Remedial Investigation process. The additional data requested by Ecology included additional sitewide groundwater monitoring and additional groundwater investigation near historical borings SB-8 and SB-9 located in the western portion of the terminal. Results of the additional investigation indicated the presence of petroleum hydrocarbons in groundwater at concentrations above Washington Model Toxics Control Act (MTCA) Method A Cleanup Levels in two apparently isolated areas in the vicinity of historical borings SB-8 and SB-9 (Apex, 2015). Seven additional monitoring wells (MW-5 through MW-10 and MW-8D) were installed at the locations shown on Figure 2 for continued groundwater monitoring. Additionally, a limited area of affected groundwater was identified in the central portion of the facility near the vapor recovery unit. A pilot study was conducted in the vicinity of well MW-5 in 2017 to evaluate the efficacy of injecting chemical oxidants to address the petroleum hydrocarbons and to support preparation of the Feasibility Study (Cascadia, 2019a).

In total, more than 90 soil borings have been installed at the site, facilitating the collection and analysis of 115 soil samples and 108 grab groundwater samples. Thirteen monitoring wells in total have been installed over the course of the project, which are periodically monitored.

In accordance with the Final Project Coordinator's Decision, a Supplemental RI and Revised FS report was submitted to Ecology on June 1, 2020. The report was revised per Ecology comments



and resubmitted on October 23, 2020 for final approval. Ecology approved the report on October 30, 2020. The report detailed the aforementioned investigations conducted between 2014 and 2020, evaluated potential cleanup alternatives, and provided a recommended cleanup action for the Facility. The approved cleanup actions include source area soil removal followed by installation of a groundwater recirculation system in two limited areas in the western portion of the Facility. The approved cleanup action also includes the injection of plume stabilization compounds to address the limited area of affected groundwater in the central area near the vapor recovery unit. Institutional controls and soil management plans will be implemented in the limited area of affected soil in the eastern portion of the Facility near the truck loading areas. The approved cleanup action also includes continued routine groundwater monitoring at the Facility.

Ecology will prepare a draft Agreed Order for cleanup action for review and negotiation by NuStar; additionally, the Department of Ecology will publish a Draft Corrective Action Plan for public comment; the final Cleanup Action Plan will be an exhibit to the Agreed Order and will describe the scope of work for the Agreed Order.

NuStar initiated quarterly monitoring at the Facility in the fourth quarter of 2017. This report presents the results of the quarterly monitoring program conducted in 2020.

1.1 SITE LOCATION, DESCRIPTION, AND HISTORY

Location. The Facility address is 5420 NW Fruit Valley Road, Vancouver, Washington 98660 (Latitude: N45° 39.70′, Longitude: W122° 41.66′), as shown on Figure 1. The Facility is located on Clark County Tax Lot (TL) No. 147360.

Physical Features. Figure 2 is a Site Plan. The Facility is approximately 31 acres and is roughly rectangular, with dimensions of approximately 800 by 1,800 feet. The Facility is located in a mixed industrial-agricultural area and currently includes aboveground storage tanks (ASTs) containing jet fuel and methanol (seven ASTs ranging in size from 30,000 to 3,000,000 gallons); a covered truck refueling rack with two smaller volume ASTs (an approximately 400-gallon AST, which stores antistatic additive [ASA] and a 7,500-gallon AST containing fuel system icing inhibitor [FSII] additive); and several buildings used for equipment storage and offices. A former underground storage tank (UST) associated with a vapor recovery system was also located on the Facility and was removed in 2001. The vapor recovery system remains on site but is no longer used. The surface of the Facility is comprised of graveled areas and grass fields, with asphalt-paved roads providing access to the fueling areas, ASTs, and office buildings.

Property History. Support Terminals Operating Partnership, L.P. (STOP) purchased the Facility from Cenex Harvest States Cooperative (Cenex) in 2003. In March 2008, NuStar acquired STOP.

The property was developed in 1957 as a truck loading terminal. Records are unclear if the Facility was developed by Cenex. Historically, chemicals and other products stored at the Facility included liquid fertilizers and refined petroleum products such as gasoline, diesel and kerosene, denatured alcohol, and petroleum product additives. A transmix tank is present in the western portion of the



Facility (Figure 2), and this is typically where waste (such as from tank-bottom cleanouts or the oil/water separator) would be stored prior to off-site disposal or recycling. The transmix tank is no longer in use.

1.2 GEOLOGY AND HYDROGEOLOGY

This section presents the geology and hydrogeology as discussed in the RI/RA Report (Ash Creek, 2010).

1.2.1 Geology

Regional Geology. The regional geology is summarized below and is based on reports prepared by Pacific Groundwater Group (PGG; 2001) and AMEC (2002). The vicinity of the Facility is dominated by three primary units: Recent Alluvial deposits, the Pleistocene Alluvial deposits, and the Troutdale Formation.

The Recent Alluvial deposits are the upper unit with deposits approximately 55 feet thick and consist of fine-grained silt and sand within the areas investigated near Vancouver Lake. The Pleistocene Alluvial deposits are approximately 95 to 115 feet thick and consist of coarse-grained sand and gravel. The Pleistocene Alluvial deposits originate from alluvial deposits from the Columbia River and deposits from the catastrophic Missoula Floods. The Troutdale Formation underlies the Pleistocene Alluvial deposits and can be greater than 1,000 feet thick. It is made up of cemented sandy gravels and semi-consolidated sands, silts, and clays.

Site Geology. During previous Facility investigations performed by others, soil borings have been installed to depths of up to 50 feet below ground surface (bgs) at the Facility. During a 2007 Facility investigation conducted by Ash Creek Associates (Ash Creek, 2007), one boring was completed to a depth of 72 feet bgs. Recent investigations in the western portion of the Facility included installing borings up to depths of 65 feet bgs.

The Recent Alluvial deposits underlying the western portion of the Facility consist of silt and silty clay with some fine sand to depths of approximately 20 to 25 feet bgs. Below 20 to 25 feet bgs, the Recent Alluvial deposits consist of layers of fine- to medium-grained sand to a depth of at least 65 feet bgs. On the eastern portion of the Facility, fine sand or sandy silt with variable layers of sand or silty sand is encountered to a depth of approximately 10 feet bgs. Below 10 feet bgs, the Recent Alluvial deposits in the eastern portion of the Facility consist of layers of fine- to medium-grained sand to a depth of approximately 50 to 60 feet bgs. The Pleistocene Alluvial deposits are encountered below the Recent Alluvial deposits and consist of sand and/or gravel layers of varying thicknesses.

1.2.2 Hydrogeology

Regional Hydrogeology. The regional aquifers, Recent Alluvial Aquifer (RAA); Pleistocene Alluvial Aquifer (PAA); and the aquifers of the Troutdale Formation, follow the regional geology discussed



above. The regional hydrogeology summarized below is based on reports prepared in support of Clark Public Utilities (CPU) South Lake Wellfield (PGG, 2001; PGG, 2009), and by Ash Creek (2008a and 2008b).

The RAA is unconfined and receives recharge directly from the land surface and/or surface water features. The PAA directly underlies the RAA and is a productive aquifer with high well yields (several thousand gallons per minute [gpm] without significant drawdown). The groundwater flow system is highly influenced by local surface water bodies. The Columbia River, Vancouver Lake, Vancouver Lake Flushing Channel, and Lake River form natural hydrologic boundaries to the groundwater flow system. Tidal influences and seasonal variations in surface water runoff cause dynamic variation in the stage of the Columbia River, and resulting adjustments in the stages of the other three connected surface water bodies. The groundwater flow system is also influenced by tidal and seasonal variations in the surface water bodies. Regionally, it is anticipated that groundwater within the RAA and PAA near the Facility would have a net gradient toward Vancouver Lake and the Columbia River.

Site Hydrogeology. In the west tank farm area, depth to first encountered groundwater is typically 16 to 20 feet bgs, and in the eastern portion of the site, near the former truck loading area, depth to groundwater typically ranges from 13 to 32 feet bgs.

First encountered groundwater at the Facility corresponds to the silt and fine- to medium-grained sand of the RAA. Shallow groundwater flow at the Facility is typically, under static conditions, flat with a slight gradient (0.0002 foot per foot [ft/ft]) to the southeast (AMEC, 2002; SECOR, 2003; Ash Creek, 2009).

2.0 GROUNDWATER MONITORING—2020

A comprehensive quarterly groundwater monitoring program was conducted in 2020 to monitor groundwater conditions at the site. The monitoring included the gauging and sampling of shallow monitoring wells MW-1 through MW-11, and deeper monitoring wells MW-5D and MW-8D using the Standard Operating Procedures (SOPs) included as Appendix A. The quarterly events were conducted from February 24 through 25; June 1 through 2; August 17 through 18; and November 16 through 17, 2020.

2.1 GROUNDWATER ELEVATION MEASUREMENTS

Fluid level measurements were recorded to the nearest 0.01 foot from the surveyed top of monitoring well casing. (Note: well MW-11 was installed in February 2019 and the top of casing has not been surveyed; however, depth to groundwater measurements were recorded during each monitoring event.) Depth to groundwater was measured using an electronic water level indicator probe. Although separate phase hydrocarbons (SPH) have not been observed at the site, the wells are assessed using an electronic water/hydrocarbon interface probe to document their absence.

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Depth to groundwater and groundwater elevations for 2020 are provided in Table 1. Historical groundwater elevation data collected from 2007 through 2020 are included in Appendix B. Copies of the well gauging forms are provided in Appendix C.

2.1.1 Separate Phase Hydrocarbons

SPH or sheen have not been observed in Facility wells, to date, and were not observed during 2020.

2.1.2 Groundwater Elevation

Consistent with previous years, the groundwater gradient was generally flat with a magnitude across the site that ranged between 0.0026 to 0.0006 in 2020. The following subsections discuss the depth to groundwater and groundwater gradients observed for each quarterly event.

First Quarter 2020

Depths to groundwater ranged from 16.26 to 29.77 feet bgs in wells MW-1 through MW-4 located in the eastern portion of the Facility, corresponding to a range in groundwater elevations of 10.36 to 10.46 feet above Mean Sea Level (MSL). Depths to groundwater in wells MW-5 through MW-10, located in the western area, ranged from 11.49 to 21.03 feet bgs, corresponding to elevations of 8.31 to 10.30 feet above MSL.

Figure 3 provides a groundwater elevation contour map for the groundwater measurements collected in February 2020 during the first quarter 2020 monitoring event. As shown on Figure 3, the groundwater gradient was generally to the southwest at a magnitude of approximately 0.0005. A groundwater high appeared to be present in the central eastern portion of the site near wells MW-1 and MW-4 suggesting flow to the southeast in the vicinity of the truck loading rack. The measured groundwater elevation in well MW-9 was approximately two feet lower than other nearby wells. This measurement was considered anomalous based on historical conditions and not used in contouring on Figure 3.

Second Quarter 2020

Depths to groundwater ranged from 12.97 to 26.46 feet bgs in wells MW-1 through MW-4 located in the eastern portion of the Facility, corresponding to a range in groundwater elevations of 13.44 to 13.77 feet above MSL. Depths to groundwater in wells MW-5 through MW-10, located in the western tank area, ranged from 7.01 to 15.53 feet bgs, corresponding to elevations of 14.57 to 13.82 feet above MSL.

Figure 4 provides a groundwater elevation contour map for the groundwater measurements collected in June 2020 during the second quarter 2020 monitoring event. The groundwater gradient was easterly at a magnitude ranging between approximately 0.0026 and 0.0006 across the site.

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Third Quarter 2020

Depths to groundwater ranged from 18.19 to 31.78 feet bgs in wells MW-1 through MW-4 located in the eastern portion of the site, corresponding to a range in groundwater elevations of 8.46 to 8.64 feet above MSL. Depths to groundwater in wells MW-5 through MW-10, located in the western tank area, ranged from 13.11 to 20.89 feet bgs, corresponding to elevations ranging between 8.54 to 8.64 feet above MSL.

Figure 5 provides a groundwater elevation contour map for the groundwater measurements collected in August 2020 during the third quarter 2020 monitoring event. As shown on Figure 5, the groundwater gradient is essentially flat, with a magnitude measuring approximately 0.0002 across the site. The measured groundwater elevation was slightly higher in wells MW-5 and MW-8 than other monitoring wells, indicating a slight flow direction to the east and southeast.

Fourth Quarter 2020

Depths to groundwater ranged from 17.59 to 31.09 feet bgs in wells MW-1 through MW-4 located in the eastern portion of the site, corresponding to a range in groundwater elevations of 9.13 to 9.29 feet above MSL. Depths to groundwater in wells MW-5 through MW-10, located in the western tank area, ranged from 12.01 to 20.07 feet bgs, corresponding to elevations ranging between 9.22 to 9.66 feet above MSL.

Figure 6 provides a groundwater elevation contour map for the groundwater measurements collected in November 2020. As shown on Figure 6. the groundwater gradient across the site was approximately 0.0003 to the east during the fourth quarter 2020 monitoring event.

2.2 GROUNDWATER SAMPLING AND ANALYSIS

The following describes the field methods, analytical results and quality assurance/quality control (QA/QC) procedures for groundwater sampling conducted at the Facility in 2020.

2.2.1 Methods and Procedures

Samples were collected from each well in accordance with the low-flow sampling SOPs provided in Appendix A. In brief, Facility monitoring wells were purged prior to sample collection, utilizing a peristaltic pump with the intake of the tubing placed midway within the screened interval of the monitoring well. Monitoring wells were purged until field parameters (pH, conductivity, temperature, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) stabilized. Following stabilization of parameters, groundwater samples were collected directly from the discharge tube of the peristaltic pump into laboratory-supplied containers. Field sampling forms are provided in Appendix C.

Samples were labeled and placed in ice-cooled chests for transport, under chain-of-custody protocol, to Apex Laboratories of Tigard, Oregon, for the following analyses:



- Benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert-butyl ether (MTBE), and naphthalene by U.S. Environmental Protection Agency (EPA) Method 8260C; and
- Total petroleum hydrocarbons gasoline (TPHg) by Method NWTPH-Gx and total petroleum hydrocarbons diesel (TPHd) by Method NWTPH-Dx.

2.2.2 Analytical Results

Analytical results for the 2020 groundwater monitoring events are summarized in Table 2. Historical analytical groundwater data collected from 2007 through 2020 are tabulated in Appendix D. Copies of the laboratory analytical reports are contained in Appendix E.

Groundwater analytical results for 2020 for BTEX/MTBE and TPHg and TPHd concentrations are displayed for each Facility monitoring well on Figures 7 and 8, respectively.

Eastern Area (Wells MW-1 through MW-4, and MW-11)

TPHg, TPHd, BTEX, MTBE, and naphthalene were all either non-detect or below MTCA Method A Levels in wells MW-1 through MW-4. Well MW-11, located adjacent to the vapor recovery unit, had variable BTEX, TPHg, and naphthalene concentrations with some results above MTCA Method A Cleanup Levels. Specifically, ethylbenzene and xylenes were below MTCA Method A Cleanup Levels during the first and second quarters of 2020, but above during quarters three and four. Naphthalene was below MTCA Method A Cleanup Levels during the first three quarters of 2020, but above during the fourth quarter. TPHd, toluene, and MTBE concentrations were either non-detect or below MTCA Method A Cleanup Levels in well M-11. As shown on Figures 7 and 8, well MW-11 is surrounded by wells MW-1 through MW-4, demonstrating that the TPH and BTEX concentrations in groundwater remain limited in extent.

Western Area (Shallow Wells MW-5 through MW-10, and Deeper Wells MW-5D and MW-8D)

Throughout the year, TPH, BTEX, MTBE, and naphthalene were non-detect in wells MW-7 through MW-10, MW-5D, and MW-8D, with the exception of TPH slightly above method reporting limits in well MW-5D during the first, second, and fourth quarter of 2020. TPHg, TPHd, xylenes, and naphthalene were detected in well MW-5 at concentrations above MTCA Method A Cleanup Levels. Benzene, ethylbenzene, toluene, MTBE, and total petroleum hydrocarbons in the motor oil carbon range (TPHo) were either not detected or were below MTCA Method A Cleanup Levels in the groundwater samples from well MW-5.

TPHo and MTBE were not detected above method reporting limits in well MW-6 during 2020. Consistent with previous results, TPHg, TPHd, benzene, ethylbenzene, and naphthalene were detected above MTCA Method A Cleanup Levels. Toluene and xylene concentrations were below MTCA Method A Cleanup Levels in well MW-6.



The groundwater monitoring results during 2020 are consistent with previous results that indicate the dissolved-phase hydrocarbons are limited both vertically and laterally, and appear to be two distinct and separate plumes, each localized around wells MW-5 and MW-6, respectively.

2.2.3 Quality Assurance/Quality Control (QA/QC)

QA/QC samples consisted of field duplicate samples, field trip blanks, laboratory method blanks, matrix spike/matrix spike duplicates (MS/MSD), laboratory control samples (LCS), and surrogate spike samples. The field and laboratory QA/QC results and an evaluation of the results to ascertain the usability of the data are included with the laboratory data sheets in Appendix E.

The QA/QC review of the data indicates:

- Samples were received by the analytical laboratory on ice below 6°C, in good condition and in the appropriate laboratory-supplied sample containers.
- The samples were analyzed within their respective method holding times.
- The recovery for the MS sample was within control limits.
- The recovery for the LCS sample was within control limits.
- Surrogate recoveries were within the acceptable range, with the exception of the recovery
 of a diesel-range surrogate for samples from wells MW-5 and MW-6 (report A0B0728),
 which was outside laboratory control limits. The data were flagged "F-18" and "F-20"
 respectively.
- No compounds were detected in the trip blanks or laboratory method blanks with the
 exception that diesel range hydrocarbons were detected above the reporting limit in a
 laboratory control blank (report A0H0521). The associated data would be flagged "B-02" if
 the detected concentration is less than five times the blank detection, indicating the result
 may be biased high. However, that was not the case in the reporting for this dataset and no
 data were flagged "B-02."
- The relative percent difference (RPD) between the field samples and field duplicates was within control range, with the exception (report A0H021) that the RPD for the samples from well MW-11 was greater than 30% for TPH-g, toluene, ethylbenzene, xylenes, and naphthalene. The data were flagged "R."

The overall QA objectives have been met and the data are of acceptable quality for use in this project.

3.0 FUTURE WORK

Quarterly monitoring is ongoing. Following the completion of quarterly monitoring in 2021, an Annual 2021 groundwater monitoring report will be prepared during the first quarter of 2022. A



supplemental remedial investigation and revised feasibility study was submitted to and approved by Ecology in October 2020. As discussed in Section 1.0, a draft cleanup action plan for the site is in preparation and will be implemented under a future Agreed Order with Ecology.

4.0 REFERENCES

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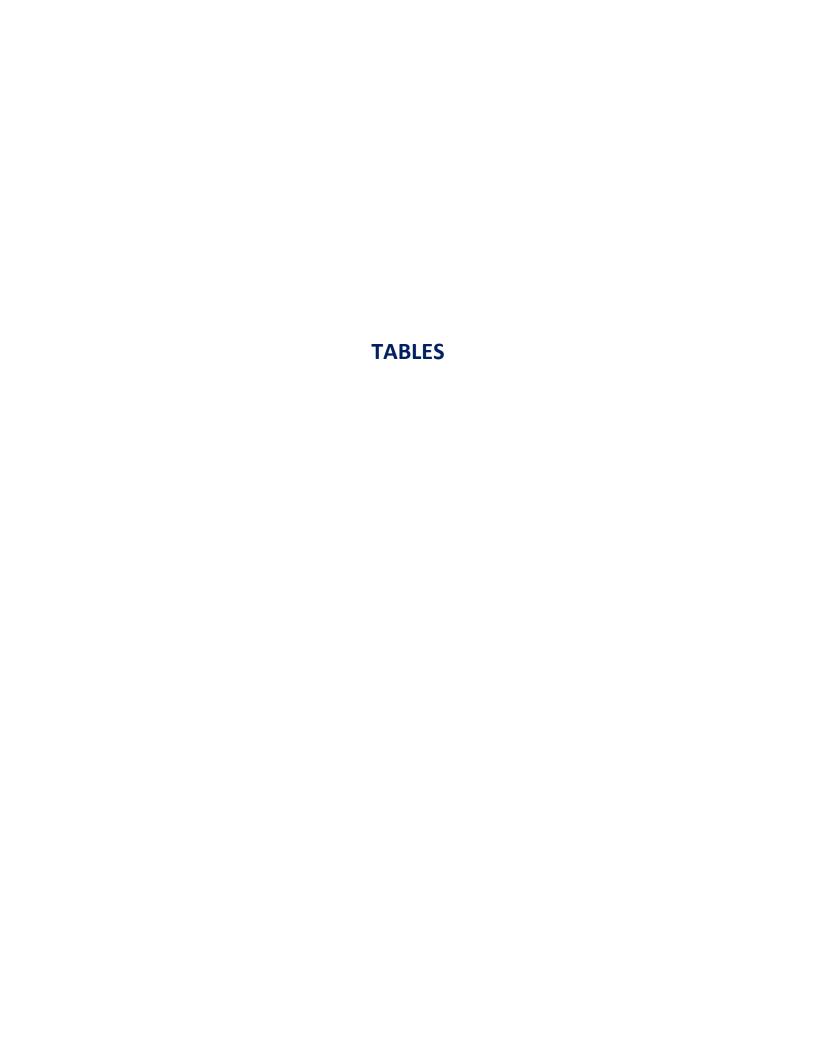


Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	02/24/20	26.72			16.26		10.46
MW-1	06/01/20	26.72	145 245		12.97		13.75
IVI VV-T	08/17/20	26.72	14.5-24.5		18.19		8.53
	11/16/20	26.72			17.59		9.13
	02/24/20	38.27			27.91		10.36
	06/01/20	38.27	20.25		24.51		13.76
MW-2	08/17/20	38.27	20-35		29.81		8.46
	11/16/20	38.27			29.01		9.26
	02/24/20	39.17			28.76		10.41
	06/01/20	39.17			25.73		13.44
MW-3	08/17/20	39.17	24.5-34.5		30.53		8.64
	11/16/20	39.17			29.88		9.29
	02/24/20	40.23			29.77		10.46
	06/01/20	40.23			26.46		13.77
MW-4	08/17/20	40.23	20-35		31.78		8.45
	11/16/20	40.23			31.09		9.14
	02/24/20	27.03			17.00		10.03
	06/01/20	27.03			13.21		13.82
MW-5	08/17/20	27.03	10-25		18.39		8.64
	11/16/20	27.03			17.48		9.55
	02/24/20	26.71			16.62		10.09
MW-5D	06/01/20	26.71			12.63		14.08
	08/17/20	26.71	35-45		18.13		8.58
	11/16/20	26.71			17.02		9.69
	02/24/20	27.33			17.14		10.19
	06/01/20	27.33			13.45		13.88
MW-6	08/17/20	27.33	10-25		18.77		8.56
	11/16/20	27.33			17.78		9.55
							-
	02/24/20	21.67			11.49		10.18
MW-7	06/01/20	21.67	10-25		7.10		14.57
	08/17/20	21.67			13.11		8.56
	11/16/20	21.67			12.01		9.66
	02/24/20	27.68			17.38		10.30
MW-8	06/01/20	27.68	10-25		13.82		13.86
	08/17/20	27.68			19.04		8.64
	11/16/20	27.68			18.11		9.57
	02/24/20	27.87			17.79		10.08
MW-8D	06/01/20	27.87	35-45		13.80		14.07
	08/17/20	27.87			19.29		8.58
	11/16/20	27.87			18.22		9.65
	02/24/20	29.39			21.08		8.31
MW-9	06/01/20	29.39	10-25		15.53		13.86
	08/17/20	29.39			20.89		8.50
	11/16/20	29.39			20.07		9.32
	02/24/20	28.71			18.57		10.14
MW-10	06/01/20	28.71	10-25		14.68		14.03
10	08/17/20	28.71	10 23		20.17		8.54
	11/16/20	28.71			19.09		9.62



Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	02/24/20	NS			16.28		NS
MW-11	06/01/20	NS	10-25		13.95		NS
10100-11	08/17/20	NS	10-23		18.58		NS
	11/16/20	NS		-	18.70		NS

Notes:

- 1. Survey elevations determined by Bluedot Group surveying, November 2017.
- 2. Reference elevation (i.e., top of casing) relative to NAVD 88 (North American Vertical Datum of 1988), feet above mean sea level.
- 3. feet above MSL = feet above mean sea level.
- 4. NS = Not surveyed
- 5. -- = SPH (separate phase hydrocarbons) not measured/observed.
- 6. bgs = below ground surface.



Table 2
Summary of Analytical Results - Monitoring Wells
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	2/25/2020	<0.100	0.201 ^A	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	0.212 ^A	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-1	8/19/2020	<0.100	<0.189	<0.377	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/17/2020	<0.100	0.0998 ^A	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/25/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-2	6/2/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	0.00774	<0.002
	8/18/2020 11/17/2020	<0.100 <0.100	<0.189 <0.0755	<0.377 <0.151	<0.0002 <0.0002	<0.001 <0.001	<0.0005 <0.0005	<0.0015 <0.0015	0.00521 0.00243	<0.002 <0.004
	2/25/2020	<0.100	0.0955 ^A	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	<0.0762	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-3	8/18/2020	<0.100	<0.189	<0.377	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/17/2020	<0.100	<0.0748	<0.15	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/25/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	0.0914	<0.152	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-4	8/18/2020	<0.100	<0.189	< 0.377	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
	11/17/2020	<0.100	0.0783 ^A	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/24/2020	23.4	2.4 ^F	<0.154	<0.004	<0.02	0.176	0.809	<0.02	1.52
	6/1/2020	12.7	2.04 ^{B E}	0.193 ^c	<0.004	<0.02	0.244	0.844	<0.02	1.29
MW-5	8/17/2020	18.8	2.17 ^D	<0.377	<0.002	<0.01	0.154	0.704	<0.01	1.4
	8/17/2020 DUP	22.6	2.1 D	<0.377	<0.002	<0.01	0.21	0.94	<0.01	1.74
	11/16/2020	18.5	1.92 ^D	<0.151	<0.004	<0.02	0.206	1.05	<0.02	1.42
	2/24/2020	<0.100	0.109 ^A	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-5D	6/1/2020	<0.100	0.0974 ^A	<0.152	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	8/17/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	0.200	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/25/2020	15.6	4.02 ^F	<0.769	0.19	0.0308	1.74	0.420	<0.02	0.340
	2/25/2020 DUP	14.8	4.35 ^F	<0.769	0.186	0.0288	1.68	0.405	<0.02	0.329
MW-6	6/1/2020	11.3	6.92 ^{B F}	<0.15	0.163	0.0286	1.74	0.363	<0.01	0.433
	8/17/2020	14.9	2.66 ^F 4.62 ^{B F}	<0.377	0.166	0.0345	1.79	0.370	<0.01	0.316
	11/17/2020 11/17/2020 DUP	12.5 13.7	4.62 6.93 ^{B F}	<0.154 <0.157	0.149 0.163	0.0248 0.032	1.85 2.08	0.207 0.398	<0.02 <0.02	0.279 0.315
MW-5D MW-6										
	2/24/2020 6/1/2020	<0.100 <0.100	<0.0769 <0.0755	<0.154 <0.151	<0.0002 <0.0002	<0.001 <0.001	<0.0005 <0.0005	<0.0015 <0.0015	<0.001 <0.001	<0.002 <0.002
MW-7	8/17/2020	<0.100	<0.0733	<0.131	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-8	8/17/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
NAVA / OD	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-8D	8/17/2020	<0.100	<0.189	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
NANA/ O	6/2/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-9	8/17/2020	<0.100	<0.189	<0.377	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0755	<0.151	<0.0002	< 0.001	<0.0005	<0.0015	< 0.001	< 0.004



Table 2
Summary of Analytical Results - Monitoring Wells
NuStar Terminals Operations Partnership, L.P. - Annex Terminal
Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
MW-10	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
10100-10	8/19/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	2/25/2020	2.65	0.341 ^{A F}	<0.154	0.00397	<0.01	0.292	0.257	<0.01	0.0257
	6/2/2020	1.59	0.129 ^{A F}	<0.15	0.0232	<0.0025	0.352	0.0812	<0.0025	0.0225
	6/2/2020 DUP	1.62	<0.0755	<0.151	0.022	<0.0025	0.353	0.083	<0.0025	0.022
MW-11	8/19/2020	13.9 R	<0.187	< 0.374	0.00337	0.175 R	0.817 R	2.93 ^R	<0.001	0.0906 R
	8/19/2020 DUP	22.9 R	0.23 ^D	< 0.377	0.00541	0.268 R	1.36 R	4.81 R	<0.001	0.145 R
	11/17/2020	23.3	0.298 ^{A F}	<0.151	0.0359	0.0705	2.18	3.31	<0.001	0.207
Washington DOE MTCA Method A Cleanup Level		0.8	0.5	0.5	0.005	1	0.7	1	0.02	0.16

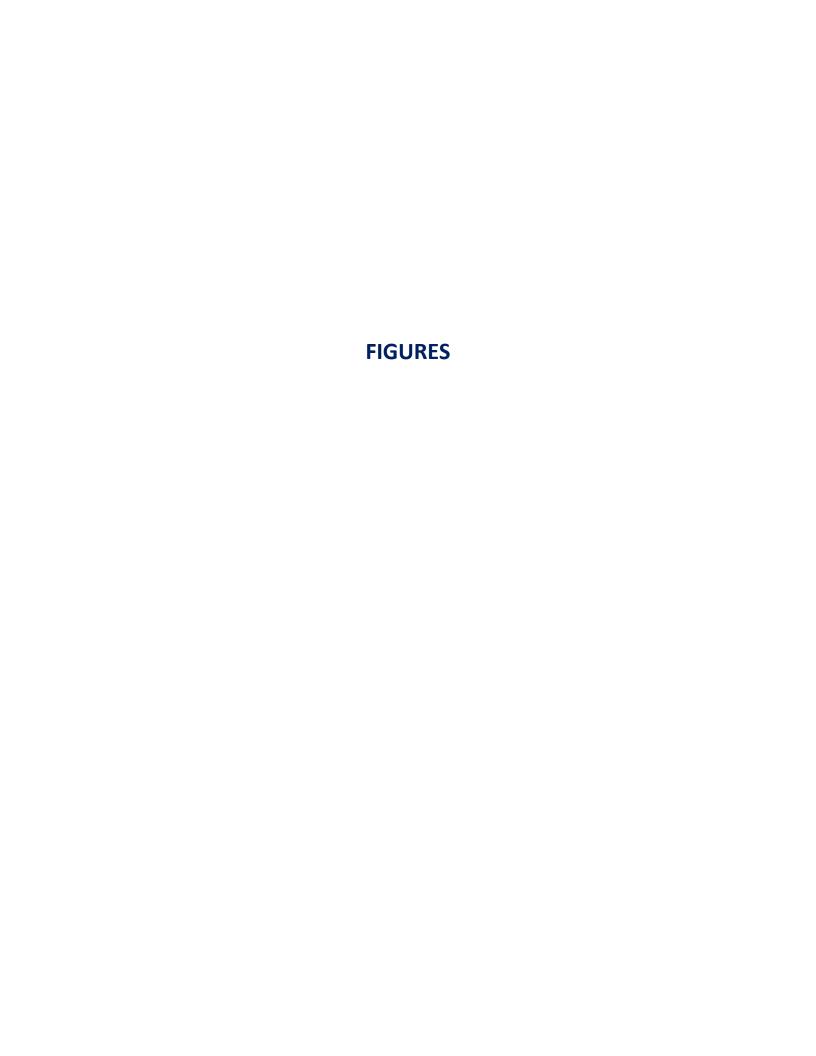
Notes:

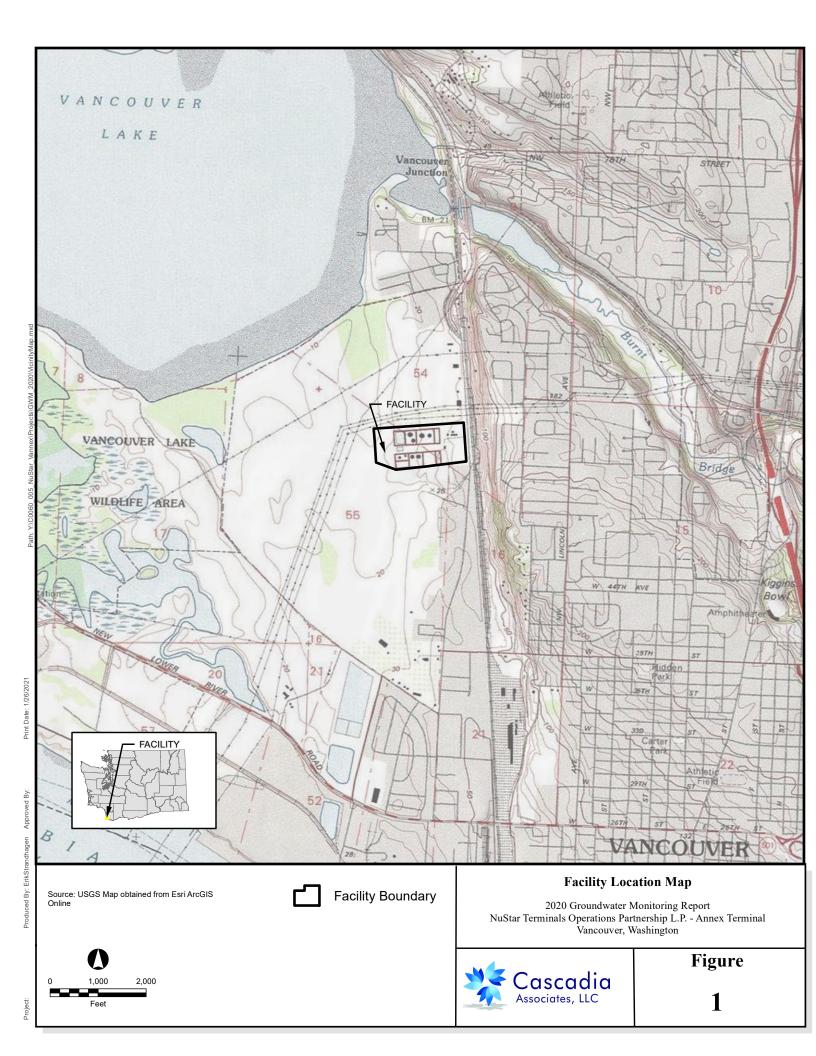
- 1. TPHg = Total petroleum hydrocarbons in gasoline carbon range by NW-TPHgx method.
- 2. TPHd = Total petroleum hydrocarbons in diesel carbon range by NW-TPHdx method.
- 3. TPHho = Total petroleum hydrocarbons ion heavy oil carbon range NW-TPHdx method.
- 4. **Bold** values represent concentration that exceeds MTCA Method A cleanup level.
- 5. mg/L (ppm) = Milligrams per liter (parts per million).
- 6. TPHg cleanup level dependent on presence of benzene in groundwater. Cleanup level = 0.800 mg/L if benzene is present and 1.00 mg/L if benzene is not present.
- 7. Washington DOE MTCA Method A cleanup level = Washington Department of Ecology Model Toxics Control Act Method A cleanup level.
- 8. < = Not detected at or above the specified laboratory method reporting limit (MRL).
- 9. bgs = below ground surface
- 10. -- = Sample not analyzed for constituent.

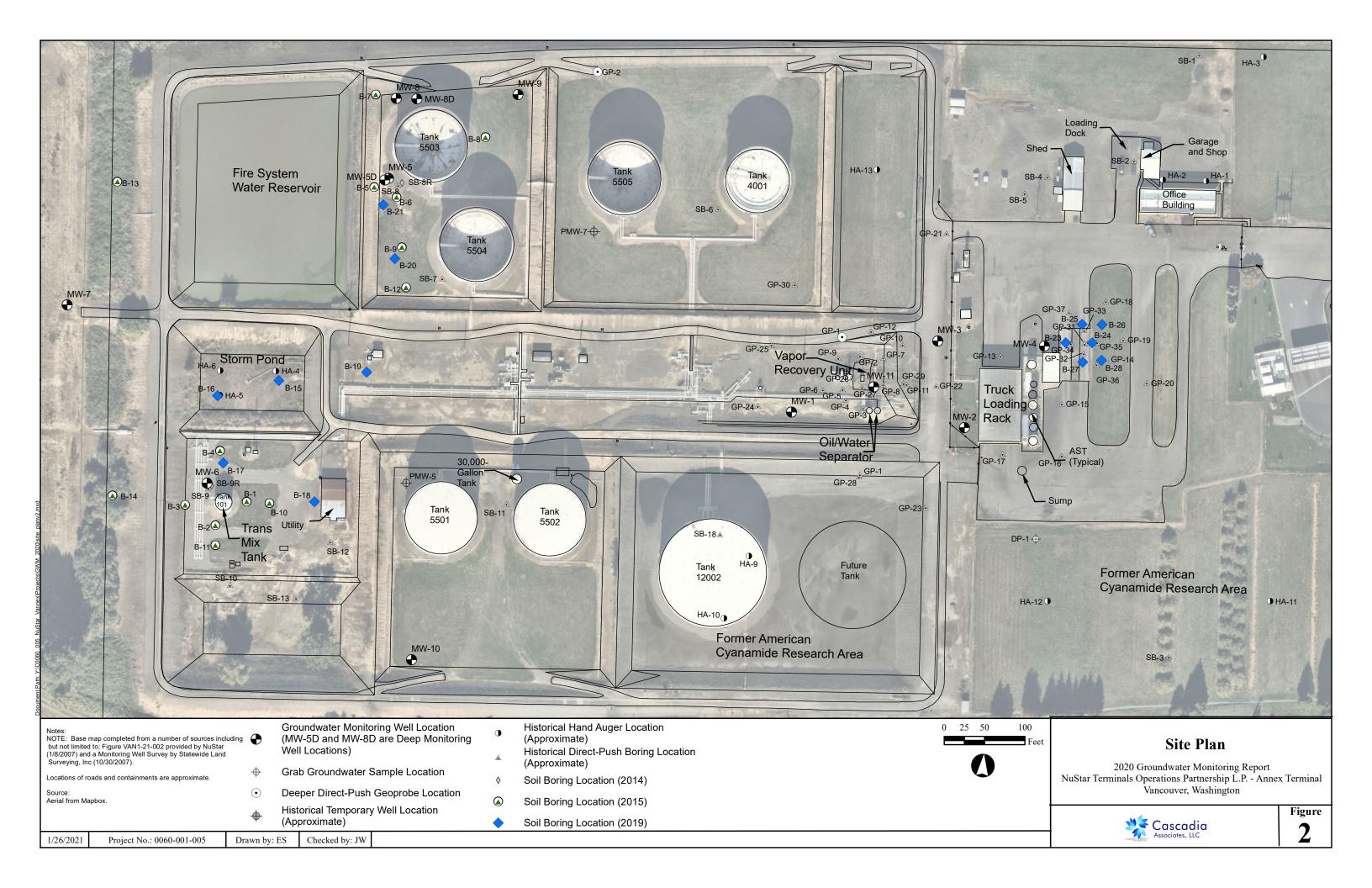
Notes on Quality Assurance/Quality Control Data Qualifiers

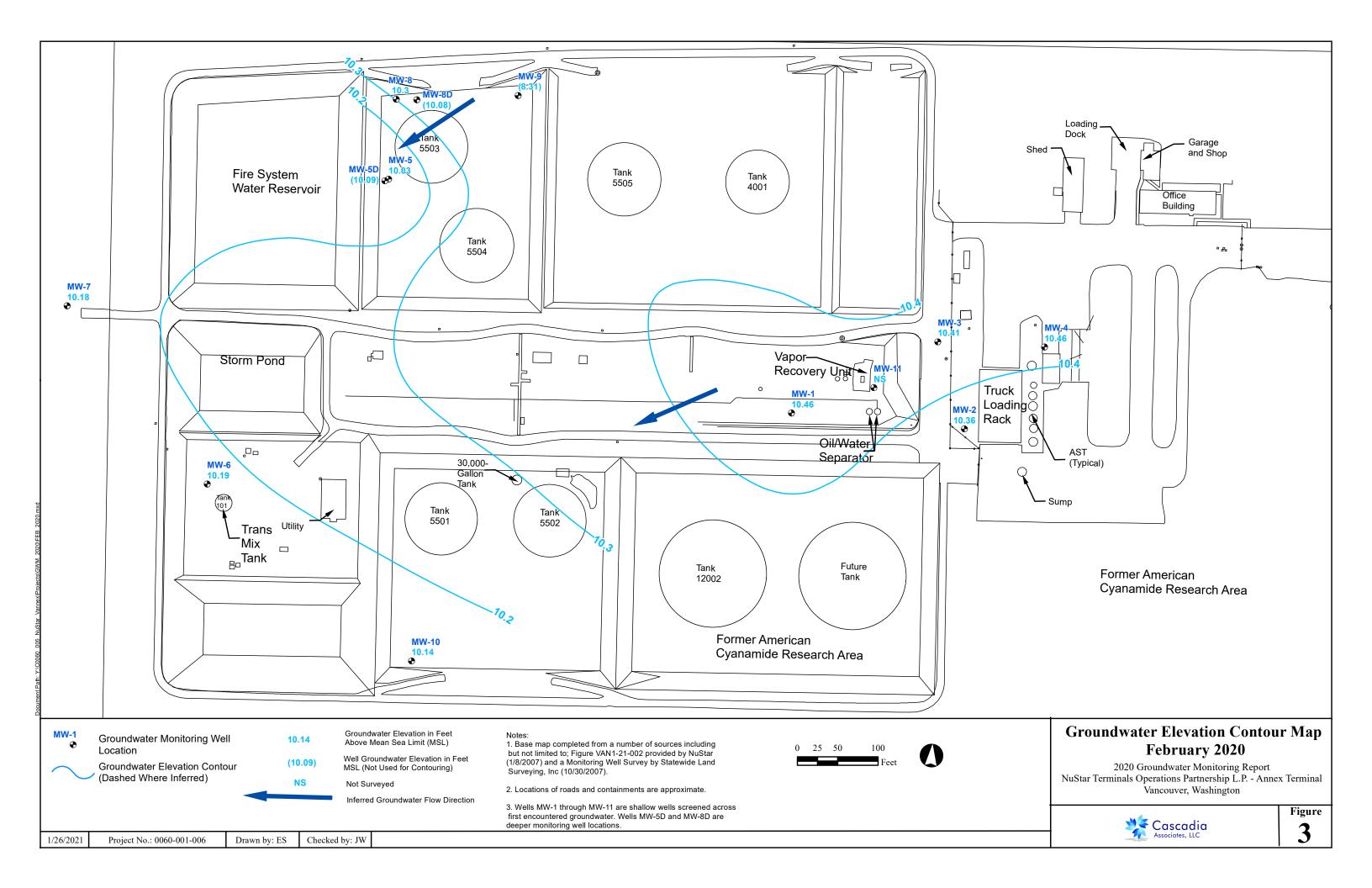
- A: Data flagged F-11 = The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- B: Data flagged F-13 = The chromatographic pattern does not resemble the fuel standard used for quantitation.
- C: Data flagged F-16 = Results for oil are estimated due to overlap from the reported diesel result.
- D: Data flagged F-18 = Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
- E: Data flagged F-19 = Results are estimated due to the presence of multiple fuel products.
- F: Data flagged F-20 = Result for Diesel is estimated due to overlap from Gasoline Range Organics or other VOCs.
- R: Data flagged R = The relative percent difference between the sample and duplicate sample is above 30%.

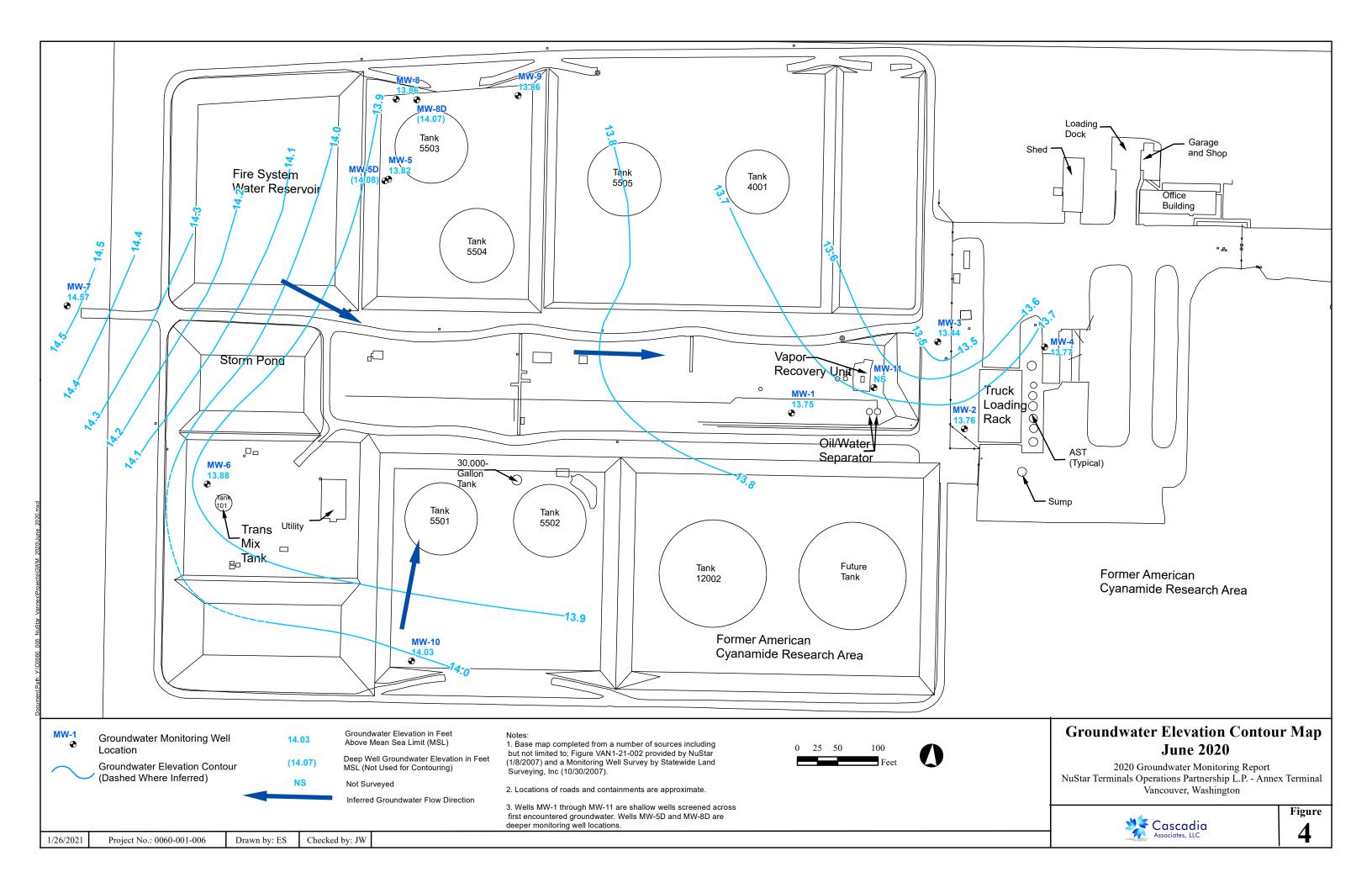


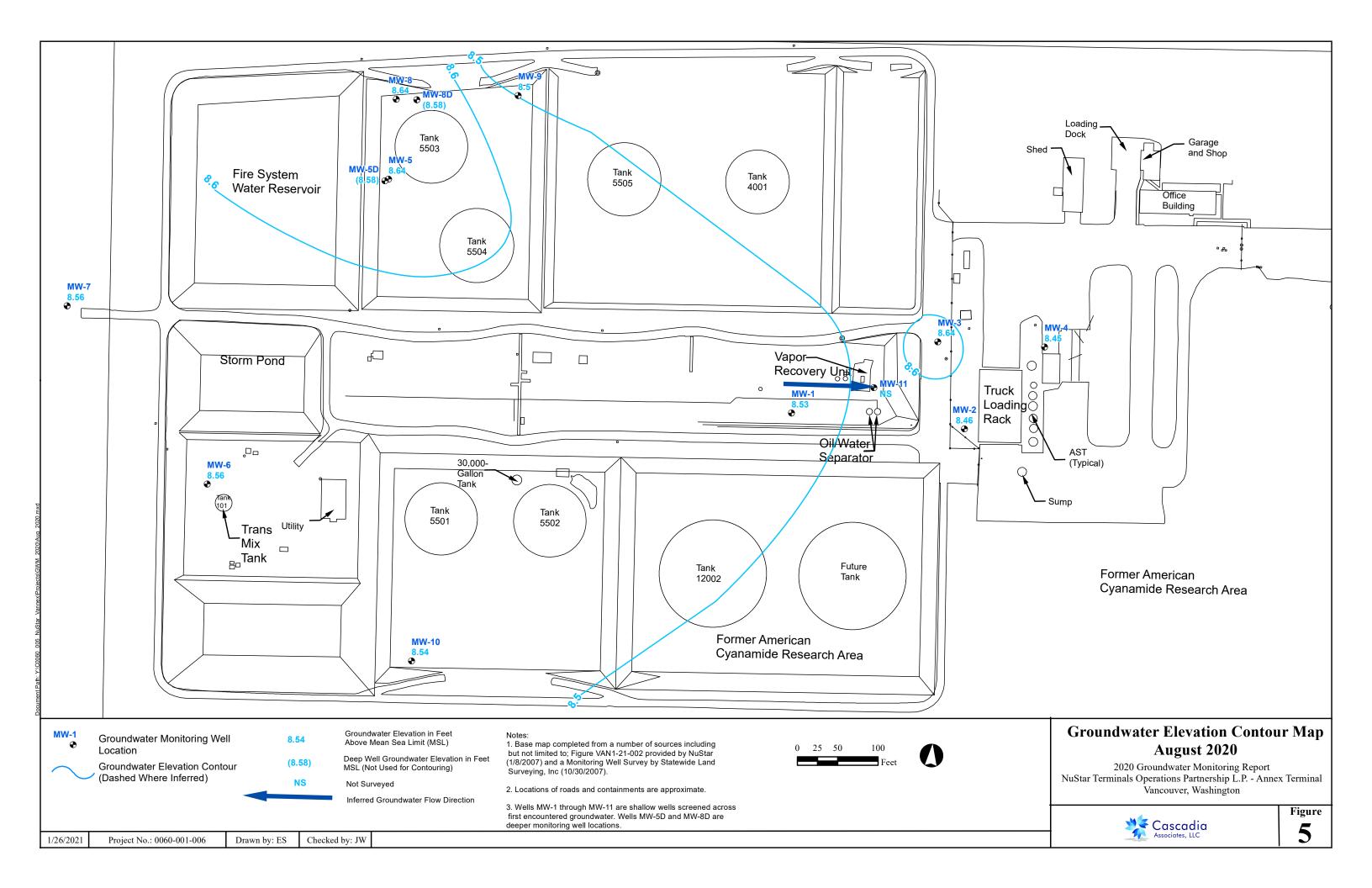


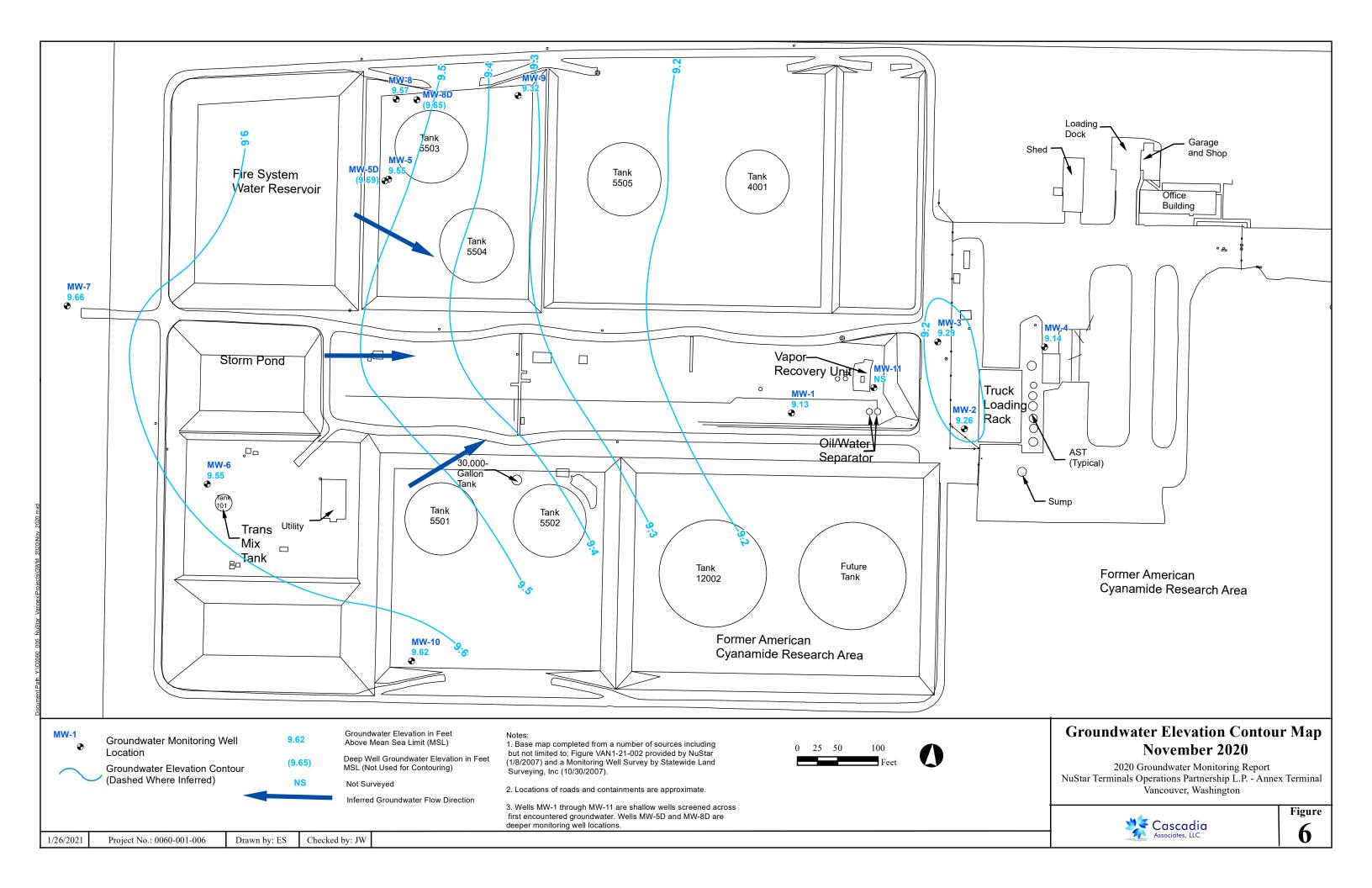


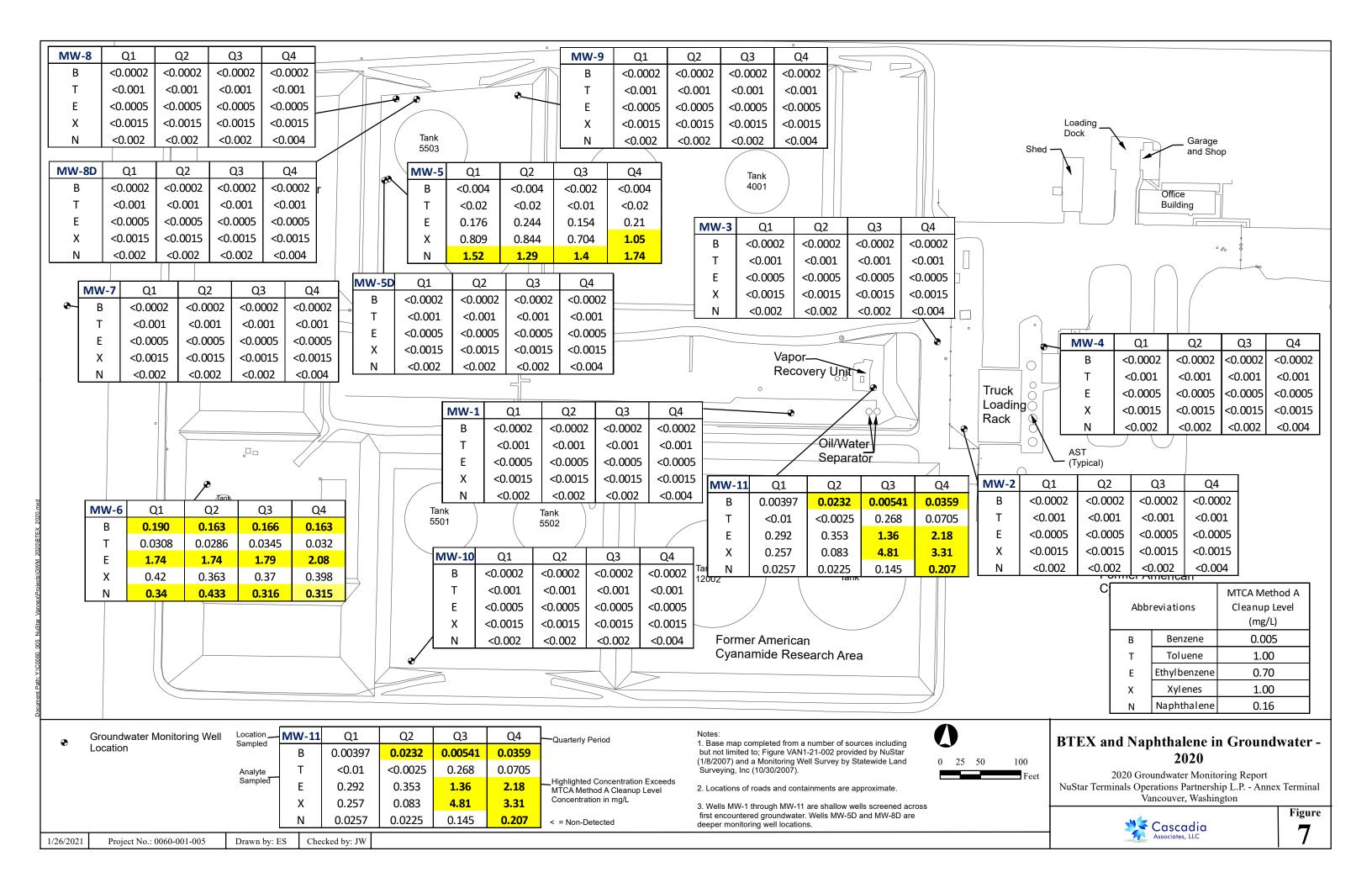


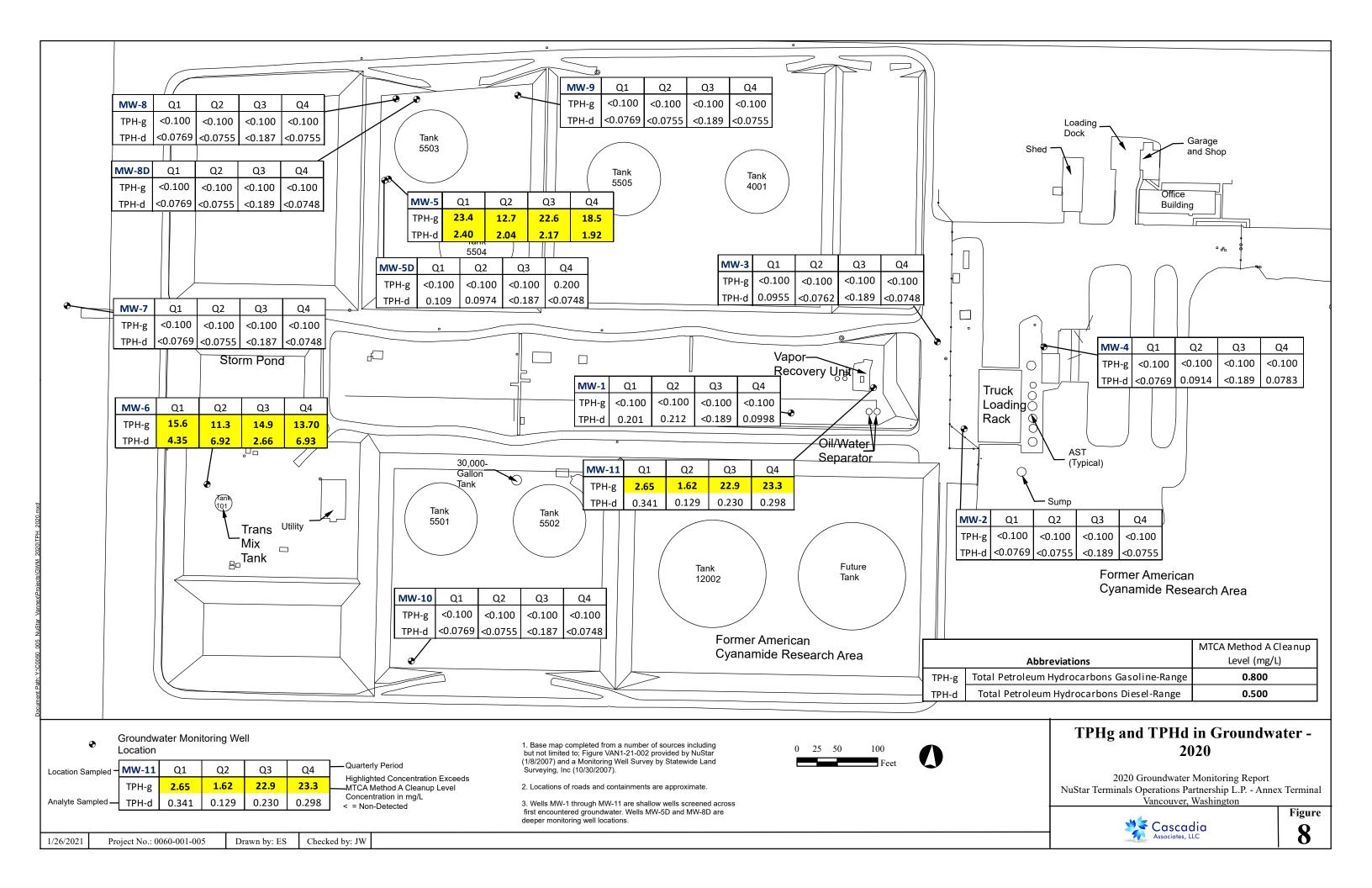


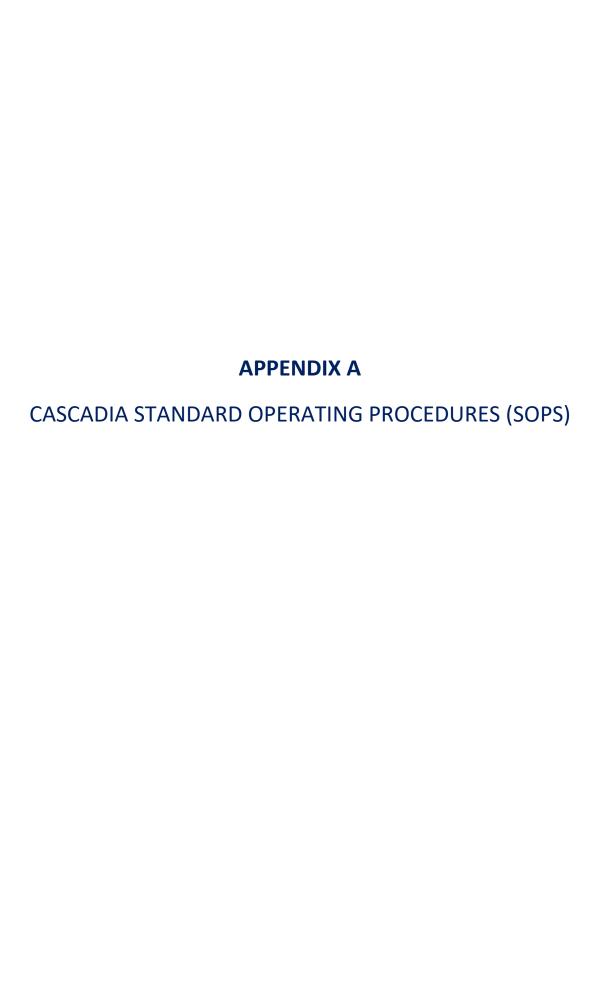












FIELD NOTES AND DOCUMENTATION

SOP Number: 17.3

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1. PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes the methods for documenting environmental field activities. The purpose of establishing SOPs for field notes and documentation is to establish a consistent method and format for the use and control of documentation generated during daily field activities. Field notes and records are intended to provide sufficient information that can be used to recreate the field activities, as well as, the collection of environmental data. Information placed in these documents and/or records shall be factual, detailed and objective.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- · Bound field books;
- Black waterproof and/or indelible ink pens; and
- Field forms.

3. METHODOLOGY

This SOP primarily includes the documentation procedures for the field logbooks. However, procedures discussed in this SOP are applicable to all other types of field documentation collected, and should be universal in application. Details of other field records and forms (e.g. boring logs, sample labels, chain of custody records, and waste containment labels are discussed in the specific SOP associated with that field activity (e.g. borehole drilling, sample handling, investigative derived waste), and not covered in detail in this SOP.

Field Logbooks:

Field personnel will keep accurate written records of their daily activities in a bound logbook that will be sufficient to recreate the project field activities without reliance on memory. This information will be recorded in chronological order. All entries will be legible, written in black waterproof or indelible ink, and contain accurate and inclusive documentation of field activities, including field data observations, deviations from project plans, problems encountered, and actions taken to solve the problem. Each page of the field logbook will be consecutively numbered, signed and dated by the field author(s). Pages should not be removed for any reason.

There should be no blank lines on a page. A single blank line or a partial blank line (such as at the end of a paragraph) should be lined to the end of the page. If only part of a page is used, the remainder of the page should have an "X" drawn across it.

In addition to documenting field activities, field logbooks will include the following:

- Date and time of activities.
- Site location,
- Purpose of site visit,
- Site and weather conditions,



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• Personnel present, including sampling crew, facility/site personnel and representatives (including site arrival and departure times),

- Subcontractors present,
- Regulatory agencies and their representatives (including phone numbers, site arrival and departure times),
- · Level of health and safety protection,
- · Sampling methodology and information,
- Sample locations (sketches are helpful),
- Source of sample(s), sample identifications, sample container types and preservatives used, and lot numbers for bottles and preservatives (if applicable and if not recorded on other forms or in a sample control logbook),
- A chronological description of the field observations and events,
- Specific considerations associated with sample acquisition (e.g., field parameter measurements, field screening data, HASP monitoring data, etc.) (if not recorded on another form),
- Wastes generated, containment units (including volumes, matrix, etc), and storage location (if not recorded on another form),
- Field quality assurance/quality control samples collection, preparation, and origin (if not recorded on other forms or in a sample control logbook),
- The manufacturer, model and serial number of field instruments (e.g., PID, water quality, etc.) shall be recorded, if not using a calibration form. Also, source lot # and expiration date of standard shall be recorded if calibrated in the field.
- Well construction materials, water source(s), and other materials used on-site (if not recorded on another form).
- Sample conditions that could potentially affect the sample results,
- If deviating from plan, clearly state the reason(s) for deviation,
- Persons contacted and topics discussed,
- Documentation of exclusion zone set-up and location,
- Documentation of decontamination procedures, and
- Daily Summary.

Field situations vary widely. No general rules can specify the extent of information that must be entered in a logbook. However, records should contain sufficient information so that someone can reconstruct the field activity without relying on the collector's memory. Language used shall be objective, factual, and free of personal opinions. Hypothesis for observed phenomena may be



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recorded, however, they must be clearly indicated as such and only relate to the subject observation.

Logbooks will be assigned to a specific sampling team. If it is necessary to transfer the log book to alternative team member during field work, the person relinquishing the log book will sign and date the log book at the time of transfer.

Field logbooks should consist of a bound book, in which the insertion or removal of pages will be visibly noticeable after the logbook has been assembled. Logbooks can be prepared by gluing or laminating pages together either at the left side or top of the page. If inclement weather is expected, logbooks may have plastic laminated front and back covers to protect the interior pages, and should not be broken apart for coping. Loose-leaf binding, such as comb binding is not considered hard binding. To maintain the integrity of the logbook, pages should be consecutively numbered prior to use. Logbook pages can be of any format, and may include blank pages for recording or field forms that are used for specific tasks. As an alternative, commercially bound and consecutive page numbered field logbooks may also be used.

Additional Field Forms/Records:

Additional field records may be required for each specific field event. The use of these records and examples are described in other SOPs specific for the activity (e.g. Borehole Logging SOP, Groundwater Sampling and Purging SOP, etc.). These other records may include:

- · Borehole Logs during drilling,
- Well Construction and Development records,
- Groundwater Purge and Sample Collection Records,
- · Water Level Monitoring,
- Investigation Derived Waste (IDW) Tracking Records,
- Instrument Calibration Records, and
- Health and Safety Monitoring Records and sign-off sheets.

Prior to field activities, the field sampling personnel will coordinate with the Project Manager, or designee, to determine which additional records will be required for the specific field task. These additional records will be maintained in a field file or a three-ring notebook throughout the duration of the field activities, or included in a specially prepared site-specific notebook. If the field notebook is being created, the forms may be part of the laminated book.

Corrections:

If an error is made in the field, logbook corrections will be made by drawing a single line through the error, entering the correct information, and initialing and dating the change. Materials that obliterate the original information, such as correction fluids and/or mark-out tapes, are prohibited. All corrections will be initialed and dated. Some projects require that a brief reason for the change must also be added where the correction was made. Ask the Project Manager, if this requirement is necessary.



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Documentation Reviews:

Periodically, the Project Manager, or designee, will review the field logbooks pertaining to the activities under their supervision. The elements of this review will include technical content, consistency, and compliance with the project plans and SOPs. Discrepancies and errors identified during the review should be resolved between reviewer and author of the field documentation. Corrections and/or additions of information shall be initialed and dated by the field author or reviewer.



CASCADIA ASSOCIATES

STANDARD OPERATING PROCEDURE

Low Flow Groundwater Sampling

SOP Number: 17.5

Date: July 25, 2017

Revision Number: 0

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1. PURPOSE AND SCOPE

The objective of this standard operating procedure (SOP) is to define the methods and requirements for collection of groundwater samples from monitoring wells applying low flow protocols. Low flow sampling is a technique for collecting samples that does not require the removal of large volumes of water and therefore does not overly agitate the water, suspend particles, or potentially aspirate VOCs. Typical flow rates for low flow sampling should range from 0.1 L/min to 0.5 L/min depending on site characteristics. The groundwater monitoring activities will consist of measuring water levels, purging and sampling groundwater, and measuring groundwater field parameters. This procedure is applicable during all Cascadia Associates, LLC low flow groundwater sampling activities.

2. EQUIPMENT AND MATERIALS

The following materials are necessary for this procedure:

- Traffic cones, tools, keys, and buckets/drums;
- Water quality meter with calibration solutions (record daily calibration/calibration check in field notes);
- Sampling equipment (water level indicator, pump, tubing);
- Laboratory-supplied sample containers (Consult the project-specific sampling and analysis plan (SAP) for sampling requirements);
- Field documentation materials;
- · Decontamination materials; and
- Personal protective equipment (consult the site-specific Health and Safety Plan).

3. METHODOLOGY

Water Levels:

Water levels in the wells will be measured and recorded for the purpose of determining groundwater elevations and gradient. The wells will be opened and the water level allowed to equilibrate before the measurements are taken. Measurements of the depth to water will be made to the nearest 0.01 foot using an electronic water level indicator.

Purging:

Purge using low-flow sampling equipment (e.g., peristaltic or bladder pump) at a rate no greater than the recharge rate of the groundwater to prevent water table drawdown. Unless specified otherwise in the project-specific SAP the sample tubing/pump will be lowered to the middle of the screened interval. Groundwater field parameters (pH, electrical conductivity, and temperature) will be measured using a water quality meter and flow cell connected to the discharge tubing of the sample pump to assess the effectiveness of purging. Purging will be considered complete when the water quality parameters (i.e., pH, temperature, and specific conductance) stabilize within 10 percent for three consecutive 3-minute intervals. Consult the



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Low Flow Groundwater Sampling

project-specific SAP for additional parameters and stabilization criteria. Purge water will be placed in Department of Transportation (DOT) approved drums.

Sample Collection:

After the purging of each well is complete, collect groundwater samples for chemical analyses using the same pump used for the well purging.

Low Yield Sampling Procedure:

If a well pumps dry during purging discontinue measurement of water quality parameters. Collect groundwater samples once the water level recovers to 90 percent of the pre-purge water column. Contact project manager in the event of slow recharge conditions. Always collect samples for VOC analysis as soon after recharge as possible.



APPENDIX B HISTORICAL GROUNDWATER ELEVATION DATA

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	05/14/02	NS			16.00		NS
	05/25/07	26.66			14.92		11.74
	08/24/07	26.66			18.67		7.99
	11/26/07	26.66			17.91		8.75
	02/27/08	26.66			16.92		9.74
	03/30/10	26.66			17.09		9.57
	09/01/10	26.66			19.19		7.47
	12/16/14	26.66			16.19		10.47
	03/25/15	26.66			15.25		11.41
	06/24/15	26.66			18.43		8.23
	09/15/15	26.66			19.05		7.61
MW-1	11/30/17	26.72	14.5 - 24.5		16.16		10.56
10100-1	02/28/18	26.72			15.07		11.65
	05/29/18	26.72			8.43		18.29
	08/30/18	26.72			18.37		8.35
	02/18/19	26.72			16.51		10.21
	05/20/19	26.72			13.22		13.50
	08/28/19	26.72			19.04		7.68
	11/18/19	26.72			18.64		8.08
	02/24/20	26.72			16.26		10.46
	06/01/20	26.72			12.97		13.75
	08/17/20	26.72			18.19		8.53
	11/16/20	26.72			17.59		9.13
	11/10/20	20.72			17.59		9.13
	05/14/02	NS			27.46		NS
	05/25/07	38.21			26.46		11.75
	08/24/07	38.21			30.17		8.04
	11/26/07	38.21			29.42		8.79
	02/27/08	38.21			28.50		9.71
	03/30/10	38.21			28.66		9.55
	09/01/10	38.21			30.74		7.47
	12/16/14	38.21			27.77		10.44
	03/25/15	38.21			26.79		11.42
	06/24/15	38.21			30.05		8.16
	09/15/15	38.21			30.65		7.56
MW-2	11/30/17	38.27	20 - 35		27.66		10.61
	02/28/18	38.27			26.70		11.57
	05/29/18	38.27			19.96		18.31
	08/30/18	38.27			29.94		8.33
	02/18/19	38.27			28.04		10.23
	05/20/19	38.27			24.73		13.54
	08/28/19	38.27			30.63		7.64
	11/18/19	38.27			30.16		8.11
	02/24/20	38.27			27.91		10.36
	06/01/20	38.27			24.51		13.76
	08/17/20	38.27			29.81		8.46
	11/16/20	38.27			29.01	I	9.26



Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	05/14/02	NS			28.15		NS
	05/25/07	39.11			27.17		11.94
	08/24/07	39.11			Third SPH (feet) Groundwater (feet) FH Thickness (feet) FH Thicknes (feet) FH Thickness (feet) FH	8.07	
	11/06/07	39.11				8.75	
	02/27/08	39.11					10.40
	03/30/10	39.11					9.56
	09/01/10	39.11					7.46
	12/16/14	39.11					10.57
	03/25/15	39.11					11.39
	06/24/15	39.11					8.26
	09/15/15	39.11					7.59
MW-3	11/30/17	39.17	24.5 - 34.5				10.56
IVIVV-3	02/28/18		24.5 - 54.5				
		39.17					11.99
	05/29/18	39.17					18.26
	08/30/18	39.17					8.37
	02/18/19	39.17					10.23
	05/20/19	39.17					13.14
	08/28/19	39.17					7.66
	11/18/19	39.17			31.06		8.11
	02/24/20	39.17			28.76		10.41
	06/01/20	39.17			25.73		13.44
	08/17/20	39.17		30. 29.	30.53		8.64
	11/16/20	39.17			29.88		9.29
	05/14/02	NS			29.40		NS
	05/25/07	40.17			28.35		11.82
	08/24/07	40.17			32.12		8.05
	11/06/07	40.17			31.40		8.77
	02/27/08	40.17			30.40		9.77
	03/30/10	40.17			30.77		9.40
	09/01/10	40.17			32.62		7.55
	12/16/14	40.17			29.63		10.54
	03/25/15	40.17			28.76		11.41
	06/24/15	40.17			31.92		8.25
	09/15/15	40.17			32.61		7.56
MW-4	11/30/17	40.23	20 - 35				10.64
	02/28/18	40.23					11.63
	05/29/18	40.23					18.35
	08/30/18	40.23					8.37
	02/18/19	40.23					10.19
	05/20/19	40.23					13.49
	08/28/19	40.23					7.64
	11/18/19	40.23					8.14
	02/24/20	40.23					10.46
	06/01/20	40.23					13.77
	08/17/20	40.23					8.45
	11/16/20	40.23					9.14
	12/16/14	27.03					10.43
	03/25/15	27.03					11.66
MW-5	06/24/15	27.03	10 - 25				8.14
	09/15/15	27.03	10 20				7.68
	10/23/17	27.03			17.82		9.21
	11/30/17	27.03			16.39		10.64



Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	02/28/18	27.03			15.41		11.62
	05/29/18	27.03			8.68		18.35
	08/30/18	27.03			18.55		8.48
	02/18/19	27.03			16.70		10.33
	05/20/19	27.03			13.19		13.84
MW-5	08/28/19	27.03	10-25		19.31		7.72
	11/18/19	27.03			18.92		8.11
	02/24/20	27.03			17.00		10.03
	06/01/20	27.03			13.21		13.82
	08/17/20	27.03			18.39		8.64
	11/16/20	27.03			17.48		9.55
	10/24/17	26.71			17.50		9.21
	11/30/17	26.71			16.21		10.50
	02/28/18	26.71			15.20		11.51
	05/29/18	26.71			8.37		18.34
	08/30/18	26.71			18.51		8.20
	02/18/19	26.71			16.43		10.28
MW-5D	05/20/19	26.71	35 - 45		12.72		13.99
	08/28/19	26.71			19.01		7.70
	11/18/19	26.71			18.62		8.09
	02/24/20	26.71			16.62		10.09
	06/01/20	26.71			12.63		14.08
	08/17/20	26.71			18.13		8.58
	11/16/20	26.71			17.02		9.69
	12/16/14	27.33			16.93		10.40
	03/25/15	27.33			15.73		11.60
	06/24/15	27.33			19.34		7.99
	09/15/15	27.33			19.70		7.63
	10/24/17	27.33			18.12		9.21
	11/30/17	27.33			16.71		10.62
	02/28/18	27.33			15.77		11.56
	05/29/18	27.33			9.03		18.30
MW-6	08/30/18	27.33	10 - 25		18.99		8.34
	02/18/19	27.33			16.99		10.34
	05/20/19	27.33			13.56		13.77
	08/28/19	27.33			19.66		7.67
	11/18/19	27.33			19.31		8.02
	02/24/20	27.33			17.14		10.19
	06/01/20	27.33			13.45		13.88
	08/17/20	27.33			18.77		8.56
	11/16/20	27.33			17.78		9.55
	11/30/2017	21.67			11.12		10.55
	2/28/2018	21.67			10.19		11.48
	5/29/2018	21.67			3.4		18.27
	08/30/18	21.67			13.26		8.41
MW-7	02/18/19	21.67	10 - 25		11.41		10.26
	05/20/19	21.67			7.73		13.94
	08/28/19	21.67			13.99		7.68
	11/18/19	21.67			13.76		7.91
	02/24/20	21.67			11.49		10.18
	06/01/20	21.67			7.10		14.57



Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
MW-7	08/17/20 11/16/20	21.67 21.67	10-25		13.11 12.01		8.56 9.66
	11/30/2017	27.68			16.91		10.77
	2/28/2017 5/29/2018	27.68 27.68			16.01 9.31		11.67 18.37
	08/30/18	27.68			19.22		8.46
	02/18/19 05/20/19	27.68 27.68			17.28 13.93		10.40 13.75
MW-8	08/28/19	27.68	10 - 25		19.94		7.74
	11/18/19	27.68			19.57		8.11
	02/24/20	27.68			17.38		10.30
	06/01/20	27.68			13.82		13.86
	08/17/20	27.68			19.04		8.64
	11/16/20	27.68			18.11		9.57
	11/30/2017	27.87			17.36		10.51
	2/28/2018	27.87			16.35		11.52
	5/29/2018	27.87			9.53		18.34
	08/30/18	27.87			19.41		8.46
	02/18/19	27.87			17.59		10.28
	05/20/19	27.87	25 45		13.9		13.97
MW-8D	08/28/19	27.87	35 - 45		20.21		7.66
	11/18/19	27.87			19.80		8.07
	02/24/20	27.87			17.79		10.08
	06/01/20	27.87			13.80		14.07
	08/17/20	27.87			19.29		8.58
	11/16/20	27.87			18.22		9.65
	11/30/2017	29.39			18.78		10.61
	2/28/2018	29.39			17.79		11.60
	5/29/2018	29.39			11.09		18.30
	08/30/18	29.39			21.04		8.35
	02/18/19	29.39			19.13		10.26
MW-9	05/20/19	29.39	10 - 25		14.63		14.76
-	08/28/19	29.39			21.74		7.65
	11/18/19	29.39			21.28		8.11
	02/24/20	29.39			21.08		8.31 13.86
	06/01/20 08/17/20	29.39 29.39			15.53 20.89		8.50
	11/16/20	29.39			20.89		9.32
	11/30/2017	28.71			18.16		10.55
	2/28/2018	28.71			17.19		11.52
	5/29/2018	28.71			10.38		18.33
	08/30/18	28.71			20.3		8.41
	02/18/19	28.71			18.42		10.29
	05/20/19	28.71			14.76		13.95
MW-10	08/28/19	28.71	10 - 25		21.02		7.69
	11/18/19	28.71			20.67		8.04
	02/24/20	28.71			18.57		10.14
	06/01/20	28.71			14.68		14.03
	08/17/20	28.71			20.17		8.54



Table 1
Groundwater Elevation Data
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Date of Measurement	Top of Casing Elevation (feet above MSL)	Screened Interval (feet bgs)	Depth To SPH (feet)	Depth to Groundwater (feet)	SPH Thickness (feet)	Groundwater Elevation (feet)
	02/18/19	NS			17.27		NS
	05/20/19	NS			14.32		NS
	08/28/19	NS	10 - 25		19.55		NS
101/44	11/18/19	NS			19.36		NS
MW-11	02/24/20	NS			16.28		NS
	06/01/20	NS			13.95		NS
	08/17/20	NS			18.58		NS
	11/16/20	NS			18.70		NS

Notes:

- 1. Survey elevations determined by Bluedot Group surveying, November 2017.
- 2. Reference elevation (i.e., top of casing) relative to NAVD 88, feet above mean sea level.
- 3. feet above MSL = feet above mean sea level.
- 4. NS = Not surveyed
- 5. -- = SPH not measured/observed.
- 6. bgs = below ground surface.



APPENDIX CFIELD GAUGING AND SAMPLING FORMS

Project: GWM 3Q20
Client: Nutstan Vannar
Sampler: GW

Date:

Permit:

	(ω)				
Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:
MW-4	756		31.78		
MW-2	822		29.81		
MW-3	830		30.53		
MW-10	836		20.17		
MW-7	847		13.11		
MW-le	851		18.77		
NW-1	857		18.19		
MW-A	901		18.58		
MW-9	910		20.89		
MW-817	915		19.29		
MW-8	920		19.04		
MW-5	924		18-39	_	
MW-5D	927		18,13	-	No. 9
-					
					/ /
1					
,					
			~		
			,		

4	44400		rs area	Well ID:	Mu	~7		Job Number:		
为京	Cuer	adia		Client:	Nu St		nex	Date:	31	17
100	Associate	s IIC		Project:	Gww	13021		Sampler:	44	,
nates the	Associate	3, 220		Weather:	Sun	85		Time In/Out:	950	- 1015
	,	1			WELL		- 2			
Monument T	vpe:	Flush-mount	Stick-up		Well Diamete	r:	2	Depth to Free		
Mondinent	ypc.	Other:	^		Well Depth:			Free Product Thickness:		
Monument C	ondition:	30000			Depth to Wat	er:	18.39	Water Column Length:		
Well Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume		
Comments:										
	= (Water He	ight) X (Multip	lier) X (# Casin	g Volumes)		AND PURE	417 7-10			
	multipliers (g		1-inch well = (2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters
Water neight	The service 18				PURGIN	G DATA				
Purge Metho	d: /	F	eri		Pump Intake	Depth:	A	15	-	
Sampling Me	pling Method:			Tubing Mater	rial & Type:	4	PE	NEW	DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
SETTINGS					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
GUA	22 300050		19 4	.2	674	15.91	774	34.06	-686	lear
CALL			10 00	. 1	1 1 6		712	9		
745			14,98	. 1	6.69	15.30	763	9.62	-45.6	
949			19.81		6.68	15.10	750	4.91	-51,6	
951	3.0		7074		6.71	15.04	750	12,40.	-49.7	4
95.8			20.50		1	15.07	745	0 17	-46.5	
739			20.50		(e.7)	1	1	2.17	1811	
1957			20.91	4	6.72	15.05	744	2.10	-44.6	
			Mark Co				1.			
3 12 14					2-7-5					
		135 2 35				Baue 7	123 6 12			
							F			Mark W
	\$11.00 miles					gent en e			13 Single	
	H.							155711301	10	-
	14.0								100 515	(
1.15		E 1007.014.			PURGIN	IG DATA				1
Sample ID:		MM	-5	Sampling Flo				Analytical Lal		Apex
Sample Time		95	7	Final Depth		22	_	Did Well Dev		No
No. of Conta	iners/Type	Prese	ervative	Analysis/Me		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
2x	14	H	2	TP	H	1	122.			
34	IID	111	00	MIC	c	AN EN STATE				
U+	40	P	<u>u</u>							
100 A				7.004.50	211			Service B	4	
7 x	16	HO		T	YH					-MW 5 Du
3~	40	140	Co	1 1	oc		1 1 1 1 1			-MW-5 Du
24		FI		1	<u> </u>					
24.00					OTEC/ADDITIO	DNAL COMMEN	UTS			
				N	O 153/ADDITIC	DINAL CUIVIIVIEI	113	2000		
				TITE OF						
1203		THEFT	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1							

WELL MONITORING DATA SHEET

Well ID: MW-50

4				Well ID:	MW	1-50		Job Number:		7	
为全	Caso	nihn		Client:	Nu	Stor Ve	umes	Date:	8	117	
TAN	Associate	adia es, LLC		Project:	GW	M 3Q2	0	Sampler:	44		
	Associate	es, LLC		Weather:	936	un 85		Time In/Out:	10	20-1045	
					WELL	DATA					
Manumont T	(Flush-mount	stick-up		Well Diamete	er:	24	Depth to Free	Product:		
Monument T	ype:	Other:	\wedge		Well Depth:	Depth:		Free Product	Thickness:		
Monument C	ondition:	98000			Depth to Wat	ter:	10,13	Water Column			
Well Cap Lock					Screened Inte		18.17				
	(Present:	Yes No			Screened Inte	ervai:		Purge Volume	:		
Comments:	/N				T						
		ight) X (Multip					1		L		
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters	
Duran Adadha	d.) ,		PURGIN			in/ S			
Purge Metho			er		Pump Intake			ODE -	NEW/	/ AFDICATED	
Sampling ivie	Sampling Method:		M-	I	Tubing Mater	rial & Type:		DPC	NEW	DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
1024			18.13	.2	6.77	17.511	694	2.16	- 46 n	clow	
				, 0		11 11	107	100	222		
1027			18.17	1	4.86	16.50	610	1,77	37.7		
1030			1	7	7,02	15,10	1418	11,61	0.01	-	
1033					7.05	14.89	40%	1,41	-71	V	
			+			1 -		1	1 - 1		
1034			4	*	7.06	14.78	405	1.30	-5.1		
										-	
										1.01	
					DUDGO	C DATA					
Compl- ID:		10/11	5	C ' 51		IG DATA		A = a 1 1	arata a ::	1 10.2	
Sample ID: Sample Time:		MM	310	Sampling Flo		18:19	<u> </u>	Analytical Lab		HARRE	
			<u> </u>	Final Depth t			Files - C:	Did Well Dew		11/10	
No. of Contai	ners/lype	Prese	rvative	Analysis/Met	nod	Field Filtered	Filter Size	MS/MSD	Duplicate ID		
3x	40	1			00						
1X	16	210	0		PH						
		116		 	110	<u> </u>					
		-							+		
			1								
				AIC.	TES/ADDITIO	NAL COMMEN	TS				
				INC	JIES/AUDITIO	MAL CUIVINIEN	113				
									,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
										= 72	

. 4				Well ID:	M	W-3		Job Number:		+=
为全	Caso	adia		Client:	N.		Vanne	Date:	4	/ Fr
200	Associate	es. IIC		Project:	9		020	Sampler.	41	N
The Carte				Weather:		Sun &	35	Time In/Out:	105	0-1125
					WELL					
Monument Ty	/pe:	Alush-mount/	Strck-up		Well Diamete	r:	2	Depth to Free		
		Other.	1		Well Depth:	Vell Depth:		Free Product Thickness:		
Monument Co	ondition:	andi	7 d	Depth to Water:		er:	19,07	Water Columr	Length:	
Well Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume	:	_
Comments:										AL LINE
Purge Volume	e = (Water He	ight) X (Multip	olier) X (# Casir	ng Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal.= 3.785 l	iters
	-				PURGIN			-A E		
Purge Metho		P	CV.		Pump Intake			MO		
Sampling Met	Sampling Method:		20		Tubing Mater	ial & Type:		DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	A
1059			19.07	.2	7.00	17.10	7.79	212	35.2	Clark
1107			1951		6.67	13 96	122	774	31.1	
1100			11/3			12.70	111	1 7		1
1103			20.35		6.48	13-18	116	4.01	24.0	
(00)			20.89	V	6.39	13.55	109	3.90	32.1	
ilil			21.07	- 1	6.32	13.54	105	3.82	32.9	
			21.40		1 - 1	13.52	106	3.80	34.3	•
1117			61.10		6.31	10,50	100	2,00	01,3	
								1		
								<u> </u>		
					PURGIN	G DATA				l.
Sample ID:		MIL)~R	Sampling Flo		S DAIA	2	Analytical Lab	oratory:	April
Sample Time:		1114		Final Depth t		73	07	Did Well Dew		NA
No. of Contain		Prese	vative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3	40		0	1/0	(Wad.				
1	1,	 		1	4		-			
LX	11	H		/	<i>r</i> 1	1 C	- 4004			
							1			
				,						
				77.74						
							11010			
					TEG/155:=:=	144 000 1145	T			
				NC	DIES/ADDITIO	NAL COMMEN	15			
						100				

Cascadia Associates, LLC Client: Date: Project: Sampler: Weather: Time In/Out: WELL DATA Depth to Free Produ t -lush-mount/Stick-up Well Diameter: Monument Type: Well Depth: Free Product Thickness: Monument Condition: Depth to Water: Water Column Length: CV60 C Well Cap Lock Present: Screened Interval: Purge Volume: Comments: Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes) 2-inch = 0.162 4-inch = 0.653 Water height multipliers (gal): 1-inch well = 0.041 1 gal = 3.785 liters PURGING DATA Peri Purge Method: Pump Intake Depth: Sampling Method: Tubing Material & Type: NEW DEDICATED Cumulative Volume DTW Clarity/Color ORP Volume Purge Rate Cond DO Temp Time Purged рΗ Other Remarks (L/min) (µS/cm) (mV) Purged (btc) (ppm) (°C) (liters) (liters) +/-0.5 ppm +/-0.5 °C +/-20 mV +/-5% 13.25 2 13.65 **PURGING DATA** Sample ID: Analytical Laboratory: Sampling Flow Rate: Sample Time: Final Depth to Water: 13.77 Did Well Dewater: No. of Containers/Type Field Filtered Filter Size MS/MSD Duplicate ID Analysis/Method NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET

Well ID:

Job Number:

1200

NA de				well iD:	10/	W- 1	-	Job Number:		7
過季	Casc	adia		Client:	N	1 Star	Vanne	Date:	8/1	7
410	Associate	auru		Project:	Gia	m 30		Sampler:	4	10
	Associate	es, LLC		Weather:	4		of	Time In/Out:	1310	1-1400
					WELL				1510	
		Flush-mount	Ktick up		Well Diamete		2	Depth to Free	Produ t	
Monument Ty	ype:		Stick-up							
		Other:	<u> </u>		Well Depth:			Free Product T	hickness:	
Monument Co	ondition:	C) Octo			Depth to Wat	er.	7089	Water Column	Length:	_
Well Cap Lock	Present:	Yes No			Screened Inte	rval:		Purge Volume		
Comments:	(3				Large vereine		
	////	: - - - - - - - - - - - - -	1: \ \ \ / H \ C:	- A 17-1 1	1					
		ight) X (Multip					T			
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
			7 .		PURGIN			ΛΛ c		
Purge Method			ren		Pump Intake			7017		
Sampling Met	Sampling Method:				Tubing Mater	ial & Type:		LDIE	(NEW	/ DEDICATED
	Volume	Cumulative	10							
Time	Purged	Volume	DTW	Purge Rate	pН	Temp	Cond	DO	ORP	Clarity/Color
Tillic	(liters)	Purged	(btc)	(L/min)	Pii	(°C)	(µS/cm)	(ppm)	(mV)	Other Remarks
	(meers)	(liters)								
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1316			20.80	12	6.14	19,41	499	21.72	29,9	clear
1016			w.v	1						
1311					6.63	15.46	294	10.32	26.3	
1312					6,50	15.39	155	664	39.5	
1225					6.40	14 95	140	1000	117 kg	
1325				,	-	1		6.75	97.	
1318		1.			6.35	14.96	122	5.50	50.1	
1331			4		6.36	14.97	118	5.22	56.5	
		 				1-1.77			7417	7
1334				1	6.33	114.97	116	5.17	57:0	V :
					-					
				-						
								4		
								6		
		ļ			ļ					
	•	·								
				<u>' </u>	PURGIN	G DATA			•	A
Sample ID:		Mu	1-9	Sampling Flo	w Rate:	1	2	Analytical Lab	oratory:	Apres
Sample Time:			34	Final Depth t			.89	Did Well Dew		100
No. of Contain			rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	The state of the s
		11636		A CM	100	rieid rintered	THECT SIZE	1413/14130	I Dapheate 15	
3×	40	[7	Cl	VC) (
2 ×		14	()		PH					
				 	1 ()					
										esectification and
		ļ		ļ						28/3/1/2 3/3/
				NO	OTES/ADDITIO	NAL COMMEN	TS			
	1	1 1 1			,					
	V splace	v did	<u></u>							
	1									
	-									
L										

WELL MONITORING DATA SHEET
Well ID: MW- 4

				Well ID:	M	W-6		Job Number:		1,=
为全	Casa	adia		Client:	N		Vanue		β	117
1	Associate	es, LLC		Project:	(h	m 30	220	Sampler:	9h	الم
11753		,		Weather:	5	un he	1	Time In/Out:	140	T-1500
		lei i		W-144-140-14	WELL		- W			
Monument T	уре:	Flush-mount	Stick-up		Well Diamete	er:	7	Depth to Free		
		Other:	0		Well Depth:			Free Product 1		
Monument C		3/00	メ		Depth to Wat	er:	18.90	Water Column	Length:	
Well Cap Lock	k Present:	Yes No			Screened Inte	erval:	_	Purge Volume		,
Comments:										
		ight) X (Multip								
Water height	multipliers (g	al):	1-inch well = 0.041		2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
D		0			PURGIN			11 =		
Purge Metho		Ver			Pump Intake Depth:			MS	1	255101750
Sampling Method:		Cumulative			Tubing Mater	ral & Type:		DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0 5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1412			18.90	. 2	6.25	17.20	820	13.37	52.5	die
1415			19.71	. (6.35	15.60	936	6.72	20.0	
1.110			,		4 1)			4.47		
1418			20.62		6.41	15.61	960	 	- 20,	
1421			21.50		6.46	15.52		3.95	-37.3	
1424			22.07		6.49	15.45	975	3.80	-45.7	
1422			12.94.	1	6,50	15.48	981	3.72	-48.1	V
1 107			1000		4170	13,10	101	JUTU	701	
								-		
			,							
	1		1	1	PURGIN	G DATA		1	1	
Sample ID:		MU	リ ~ ア	Sampling Flo		a 1		Analytical Lab	oratory:	Leed
Sample Time:		14	27	Final Depth t			3.14	Did Well Dew		No
No. of Contain	ners/Type	Prese	rvative	Analysis/Met	hod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
2x	16	H	U	TP	H					
2~	Uh	1_/_	10	10	Ć					
<u> </u>	70		, ~	V 0						
				NC NC	TES/ADDITIO	I NAL COMMEN	TS			
				110	. 10/1/00/110	IL GOMMINE				

										2.8

WELL MONITORING DATA SHEET
Well ID:

. 4				Well ID:	MW-3			Job Number.		
为金	Case	nihn		Client:	Nus	en Var	nex	Date:	8	118
1	Casc	es, LLC		Project:	GWM	302	0	Sampler:	4n	U
100 Marie				Weather:	Su	n 75		Time In/Out:	700)
		6			WELL		- ~			
Monument T	ype:		Stick-up		Well Diamete	!r:	2	Depth to Free		
		Other:	(1)		Well Depth:			Free Product 1		
Monument C	ondition:	AST.			Depth to Water:		30.52	Water Columr	Length:	
Well Cap Lock	k Present:	yes No			Screened Inte	erval:		Purge Volume		
Comments:										
			olier) X (# Casır				1			
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4 inch = 0.65	3	1 gal 3.785 l	iters
Purge Metho	d.	0	.0		PURGIN		1	hA C		
Sampling Met			7		Pump Intake Tubing Mater		K	MS B	Niew	DEDICATED
Dailibilia Mici		Cumulative	(h)		Tubing Mater	lai & Type.	<i>D</i>		LAFAA	DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/ 20 mV	
745			30.52	.25	6.18	17,24	262	17.32	14.0	clear
749			30.51	1	6.39	15.61	266	10.11	7.2	
10					1	1 '	228			11 1
771					6.50	15.20	1	5.03		Gouery
754					6.54	15,17	277	3.58	29.4	
757					6,52	15,14	218	3.25	32.3	
300					6.52	15.12	216	3.11	36.1	1
										5.00
										300
					-					
					-					
Carriel 15			-2	C		G DATA	-	Ampliate 14 1		11000
Sample ID: Sample Time:	. 3	MW		Sampling Flo Final Depth 1		30.5		Analytical Lab		April
No. of Contai			ervative	Analysis/Me		Field Filtered	7	MS/MSD	Duplicate ID	11/0
2	1 (1)	11	• 0	A I C	C	r icia i illerea	i iicci size	1413/14130	Duplicate 1D	
DX	40	14		VC) <u> </u>					
2x	16	1 1	U	I	'H		1			
		`								
										A A A A A A A A A A A A A A A A A A A
<u> </u>				B.14	TEC/ADDITIO	NIAL CONTRACT	ITC ITC			MINER
				N	JIES/ADDIIIO	NAL COMMEN	112			
			40.							
							~			

WELL MONITORING DATA SHEET WellID Job Number: Cascadia Client: Date: Project: Sampler: Associates, LLC Time In/Out: Weather: WELL DATA lush-mount/Stick-up Well Diameter. Depth to Free Product: Monument Type: Well Depth: Free Product Thickness: Monument Condition: , 60 Water Column Length: Depth to Water: Well Cap Lock Present: Screened Interval: Purge Volume: Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes) 1 gal = 3.785 liters Water height multipliers (gal): 1-inch well = 0.041 2-inch = 0.1624-inch = 0.653 **PURGING DATA** Purge Method: Pump Intake Depth: Sampling Method: Tubing Material & Type: NEW DEDICATED Cumulative Volume Clarity/Color DTW DO ORP Volume Purge Rate Temp Cond Time Purged рΗ Other Remarks (µS/cm) (mV) Purged (btc) (L/min) (°C) (ppm) (liters) (liters) +/ 05°C +/-5% +/-0.5 ppm +/-0.1 218 6.26 20,63 .25 Clear 909 **PURGING DATA** Sample ID: Sampling Flow Rate: Analytical Laboratory: 3[.60 Field Filtered Filter Size Final Depth to Water: Did Well Dewater: Sample Time: • MS/MSD Duplicate ID No. of Containers/Type Analysis/Method NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET Well ID: Job Number: Cascadia WM 3Q20 Client: Project: Sampler: Associates, LLC Weather: Time In/Out: WELL DATA Flush mount/Stick-up Depth to Free Produ t. Well Diameter: Monument Type: Free Product Thickness: Well Depth: 29,64 Water Column Length: Monument Condition: Depth to Water: Well Cap Lock Present: Screened Interval: Purge Volume: Comments: Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes) Water height multipliers (gal): 1-inch well = 0.041 1 gal = 3.785 liters 2-inch = 0.1624-inch = 0.653 **PURGING DATA** Purge Method: Pump Intake Depth: Sampling Method: NEW DEDICATED Tubing Material & Type: Cumulative Volume ORP Clarity/Color Volume Purge Rate Temp Cond DO Time Purged рΗ Other Remarks (µS/cm) (mV) Purged (btc) (L/min) (°C) (ppm) (liters) (liters) +/-0.5 °C +/-0.5 ppm +/-20 mV 20.97 260 15.62 65.7 16,27 15.74 215 15,60 208 15,55 207 **PURGING DATA** Sample ID: Sampling Flow Rate: Analytical Laboratory: 29.70 Did Well Dewater: Sample Time: • Final Depth to Water: Field Filtered | Filter Size MS/MSD Duplicate ID No. of Containers/Type Analysis/Method NOTES/ADDITIONAL COMMENTS

WELL MONITORING DATA SHEET
Well ID:

4				Well ID:	Mh	-		Job Number:		
为全	Casa	ndia		Client:	ME	Her Va	rux	Date:	8/1	9
TAN	Associate	adia es, LLC		Project:	GUN	Har Va	0	Sampler.	140	
a meal after				Weather:	Su	n 30		Time In/Out.	800	-835
	-		-		WELL		1			
Monument T	ype:	Flùsh-mount,	/Stick-up		Well Diamete	er:	2	Depth to Free		
	7	Other:	\mathcal{L}		Well Depth:			Free Product 1	hickness:	
Monument C	Condition:	900	\mathcal{O}		Depth to Wat	ter:	17,93	Water Column	Length:	
Well Cap Loc	k Present:	Yes No			Screened Inte	erval:		Purge Volume		
Comments:								<u> </u>		
Purge Volum	e = (Water He	ight) X (Multip	olier) X (# Casir	ng Volumes)						
Water height	t multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal 3.785 l	iters
			,		PURGIN	G DATA				
Purge Metho		t	UT)		Pump Intake			MS		100
Sampling Me	thod:		Lh_		Tubing Mater	rial & Type:	4	SPE /	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
911			12.97	- 2	5.76	20.44	359	21.14	87.9	cloride
Quil			5 97	,	5,86	15.67	704	177	101	1
BIG			1+.14				109	6. 77	4	eller
817					5.87	15,65	699	4.604	64,0	
820					6.04	15.48	595	2.79	51.7	. /
213					607	15,49	581	2,54	51.1	
227					1 12	104/1	572	1 17	500	
OLT			4		6.12	13.46	746	6.41	50,0	-
				L	PURGIN	G DATA				
Sample ID:		MW	-	Sampling Flo		. 2		Analytical Lab	oratory:	Drex
Sample Time		82	7	Final Depth to		17.	97	Did Well Dew		INO
No. of Contai	ners/Type	Prese	rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3+6	0	Ц	CR.	Vo	9C					
12		11	0		oit					
- W	10	H			111				-	
									, i	
						'				
				ALC:	TEC/ADDITIO	NAL COMMEN	TC			
	·			NC	I ES/ADDITIO	NAL CUIVINIEN	13			
							•			

WELL MONITORING DATA SHEET Well ID: Job Number: Cascadia Associates, LLC Client: Date: Project: Sampler: Weather: Time In/Out: Flush mount/Strck-up Well Diameter: Depth to Free Product: Monument Type: Well Depth: Free Product Thickness. Depth to Water: 19.26 Monument Condition: Water Column Length: Well Cap Lock Present: Purge Volume: Screened Interval: Comments: Purge Volume = (Water Height) X (Multiplier) X (# Casing Volumes) Water height multipliers (gal): 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 liters 1-inch well = 0.041 PURGING DATA Purge Method: Pump Intake Depth: Sampling Method: Tubing Material & Type: NEW DEDICATED Cumulative Volume ORP Clarity/Color Volume DTW Purge Rate Cond DO Temp Time Purged рΗ Purged (btc) (L/min) (µS/cm) (ppm) (mV) Other Remarks (°C) (liters) (liters) +/-0.1 +/-0.5 °C +/-0.5 ppm +/-20 mV 45.0 **PURGING DATA** Sample ID: Sampling Flow Rate: Analytical Laboratory: 20,07 Sample Time: 902 Final Depth to Water: Did Well Dewater: No. of Containers/Type Field Filtered Filter Size MS/MSD Preservative Analysis/Method Duplicate ID NOTES/ADDITIONAL COMMENTS

				Well ID:	MW	~10	4	Job Number:	0 /	
42	Casc	adia		Client:	H	1 Star)		Date:	6/	9
4	Associate	s IIC		Project:	Gus	m 302		Sampler:	40	10
-	Associate	35, LLC		Weather:		Sun 30		Time In/Out:	1/20	- 1210
					WELL	DATA				
		Hush-mount/	Stick-up .		Well Diamete	er:	2	Depth to Free	Product:	
onument Ty	pe:	Other:	^		Well Depth:			Free Product T		
onument Co	ndition:	Carrel 1)		Depth to Wat	ter:	19.89	Water Column		
		ago o			Screened Inte		1001	Purge Volume:		
'ell Cap Lock	Present:	Yes No			Screened inte	ervai.		ruige volume.		
omments:										
water the second	The second second	ight) X (Multipl					4: 1 -0.55		1 gal = 3.785 li	tors
ater height r	nultipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	The second second second second	4-inch = 0.65	3	1 gai - 5.765 ii	ters
			10.10		PURGIN	THE RESERVE TO SHARE THE PARTY OF THE PARTY		1115		
irge Method		1	Wy		Pump Intake	AND DESCRIPTION OF PERSONS ASSESSED.	1	NOE	NEW	/ DEDICATED
mpling Met	nod:		Uh-		Tubing Mater	rial & Type:	-6	DPC (INEVV	TUEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
SHARRE		(incord)	150 A Y A	18 18 18 18 18 18	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
110			19.89	·······································	1/21	1107	214	1510	38.7	dew
1128			11.01	,	6.3	11.07	617	70.00	. 1	000
1131					6.34	15.84	160	1.90	44.8	
1135					6.36	14.73	105	3.10	55.5	
1127					6.31	14 49	103	3.01	40.5	*
1107					1	11/ 20				
1140			9	V	6.29	14.38	103	2.95	620	4
			10.00	EVIEW						
							M2 - 101			
					(4 m)					
					A CONTRACTOR					
				. \						
	15.52.51		19,849 1.9A							
	29h		CHECK TO SERVICE STATE							
	A HELDER					IC DATA				
		- A A	130		The same of the sa	NG DATA	-	Analytical Lab	omtone	1 Ana p
ample ID:		Mu	1/10	Sampling Flo		1	97	Did Well Dew		The state of the s
iample Time:		11.	90	Final Depth			-		Duplicate ID	7100
lo. of Contai	ners/Type	Prese	rvative	Analysis/Me	,	Field Filtered	Filter Size	MS/MSD	T Duplicate 10	
SX	40	14	ll		100					
7 0	11	11	10	7	PH	1		N. C. C.		
<u> </u>	10		- C							
								13.5		
1000					ATER (1 A - 1	20141451	TC			
				N	OTES/ADDITIO	ONAL COMMEN	115			
							1			
			551M3					15		

				Well ID:	1010	W-,812		Job Number:		To
母金	Casa	adia		Client:	L Nu	Show	Janne	Date:	B	NI
400	Cusc	uulu		Project:	610	M BC	20	Sampler:	AU	9
	Associate	es, LLC		Weather:	700	M 3G	5	Time In/Out:	1130	0-1210
			7		WELL	DATA				
	1	Flush-mount/	Stick-up		Well Diamete		2"	Depth to Free	Product:	
Monument T	ype:		ССК-ЦР			:1.	6			
1		Other:	1		Well Depth:			Free Product 7		-
Monument Co	ondition:	900			Depth to Wat	er:	19.36	Water Column	Length:	
Well Cap Lock	Present	Yes No			Screened Inte	erval:		Purge Volume		
	Tresence 1	100			Joer Cerrica Trice			r drge volunie		
Comments:	(141									
		ight) X (Multip					T			
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	liters
					PURGIN		,			
Purge Metho	d:	F	eri		Pump Intake	Depth:		MS		
Sampling Met	thod:		11.		Tubing Mater	rial & Type:	L	DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1135			19.34	_	1 4 7	1499		2019		0.0
				,2	6.34	14.17	97	20.17	49.0	Creek
1138			19.42	1	6-68	13.93	117	7.93	54.5	
1142			19.39		6.84	13.61		5.85		1
110			7				120			
1145			19.39		7.01	13,52	130	3.42	54.9	
1148			1		7.02		124	3.25	54,7	
11							1 *	1		A
115				Y	704	13.51	132	3.10	54.0	11
					-		1			
			,							
									-	
				1	PURGIN	G DATA		1		
Sample ID:		Mu	1-8D	Campling FI	The same of the same of the same of	O DAIA		Applytical L-L	oraton	LOOM
		INTO	200	Sampling Flo		19	20	Analytical Lab		Apex
Sample Time:		11	51	Final Depth t		1	39	Did Well Dew		140
No. of Contain	ners/Type	Presè	vative	Analysis/Met	thod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3+	40	-	t Cl		0 C					
7	1 1	1	100		DH					
UX	11	ļt	t U		PU					
					•					
								 	-	
				NIC.	TES/ADDITIO	I NAL COMMEN	TS			
				140	J. LOJ NOVI IIO	TO TE COMMITTE			West No.	
				W				-		

Project: GWM 4Q20 Client: Nr. Sher Vannest Sampler: Date: 8/16
Permit:

Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:	
MW-1	817		17.59			
Mul-11	323		18.70		6	
MW-2	830		29.01			
MW-4	834	1	31.09			
MW-3	840		29.88			***
MW-10	854		19.09			
MW-7	901		12.01		1	
MW-6	908		17.78			1
MW-9	913		20.07		1	*3.*
MW-80	916	Mark!	18.22		*	
MW-8	919		18.11			
MW-50	924 .		17.02			
MW-5	926		17.48			
	100378		13.4			
		14.55		18.0	- 1984 Table 1	
					,	
				4	()	
		7				
	H					
						4
0					4,	483
				0	1,	

w4-				Well ID:	we	1-5		Job Number:		
73	Caso	cadia es, LLC		Client:	Nas	ter Van	mater	Date:	11	10
TAN	Associat	es. LLC		Project:	GUM	4020		Sampler:	Au	
100				Weather:	Kain	55°		Time In/Out:	930	-1015
		X			_	DATA				
Monument T	vpe:	Flush-mount,	stick-up		Well Diamete	er:	2	Depth to Free	Product:	· ·
		Other:	1		Well Depth:		Green.	Free Product Thickness:		
Monument C	ondition:	300	1		Depth to Wa	ter:	17,48	Water Column		
Well Cap Lock	Present:	Yes No		North Argin	Screened Int	erval:	-	Purge Volume		
Comments:							-	Transport or district		
urge Volume	e = (Water He	eight) X (Multip	olier) X (# Casi	ng Volumes)		Bernstein Br				
	multipliers (1-inch well =		2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters
					PURGIN	-		ALCONO TO	1 Bui - 5.705 i	iters
urge Metho	d:	(levi	TOTAL COL	Pump Intake	Depth:		MS		
ampling Met	thod:		lowlle	N	Tubing Mate		1	DRE	NEW	/ DEDICATED
	Volume	Cumulative	0				Market			in a company
Time	Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
92117			1740	1	1,95	131.9	2418	31216	1091	. / .
12112			10 00		7	1211	T 1 1	A2 1 504	10 mi	C (2 ()
777			10.04		300	1366	72 1	14,5%	16011	1
4410			18.65		7.07	13.64	713	7.15	39.0	
949			19.01		7.13	1371	746	431	-13.5	chale (Estate)
152			19 41			13 71	21/1	041	72 3	
106			11010		7.19	13.79	796	6,11	- 50.	
455			19.84		7.16	13.68	740	2.70	-37.	
958			20.13	V	716	13.67	738	2.64	-43.2	
								0.01	10.	
								7		
								GALL AND		-
							-			
									AT	
							- The St			
					PURGIN	G DATA				
ample ID:		Mu	5	Sampling Flo	THE RESERVE AND ADDRESS OF THE PARTY.	.4		Analytical Lab	oratory:	Losy
ample Time:		95	8	Final Depth t		20	46	Did Well Dewa		NE
o. of Contain	ners/Type	Prese	rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	The state of the s
3× L	0	I	4	Ve		-				
1	11		10						9	
LX	16	H	R.	TP	H	70000000000000000000000000000000000000				
LET CHE				Malara						
						6			The state of the s	
				NC	OTES/ADDITIO	NAL COMMEN	ΓS			
							٠,			

Casc Associate	adia es, LLC		Client:	10	How Va	nne	Job Number: Date:	11/16	
	es, LLC			10					
	es, LLC	tes, LLC Project: Weather:			Gum 4920			de	
	Weddier.			Re			Sampler: Time In/Out:	1015	- 1045
	-			WELL	DATA			0.00	
oe:	Flush-mount/	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	- Commo
	Other:			Well Depth:		profit	Free Product 1	Thickness:	
ndition:	Curac)		Depth to Water:		17.00	Water Column	Length:	-
Present:	Yes No			Screened Inte	erval:		Purge Volume		1800
							I dige volune		
= (Water He	ight) X (Multip	lier) X (# Casii	ng Volumes)						
				2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 li	ters
			THE PARTY	PURGIN	NAME OF TAXABLE PARTY.		9 137 13 13 13		
	Per	1		Pump Intake	Depth:		MS	1	
od:	lon	no Kla	J	Tubing Mater	rial & Type:		LDPE	(NEW)	/ DEDICATED
Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
				+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
		17.00	45	7.25	13.07	-701	8,47	-77.4	dem
		1			1371	1-9			
			1	7 711	10.0	110		50.7	
		4 494		4,30	15.20	613	2.4	-21-7	
				7.36	1335	571	2.17	-49.1	
				7.37	13.41	556	2.02	-450	
		4		7 3 10	12 46	5019	196	-1127	
				7 - 1) 0	170-10	241	1,10	721	
		4							
						SA The S		4	
						A			
				1617 17 161					
				age, H.		BARRY F	P	P. W. Line	edylerose oli
				DITECTAL	G DATA				
	INA.	-50	Sampling Flo	The second second	water the second second		Analytical Lab	oraton:	Anors
					1174		-		No
ers/Type					Field Filtered		1		144
	1				c.a · merea	1. 11.01 5120	1.715/11150	Daplicate ID	
12	H		AC	111					
IC	H	1	T	'H'	,				
			and the same			3			
			Sul-L.	LARTE A	175	76	14 THE 17 THE	de villar	
	10 10 14								
		h - Hill	NO	OTES/ADDITIO	NAL COMMEN	TS	ARRIVE I		
									N. V. M. S.
	od: Volume Purged	od: Volume Purged (liters) Cumulative Volume Purged (liters)	aultipliers (gal): I-inch well = Cumulative Volume Purged (liters) DTW Purged (liters) I 00 I 00	Volume Purged (liters) Purged (liters) Purged (liters) Purged (liters) Purged (btc) Purge Rate Purged (btc) Purge Rate Purged (btc) P	rultipliers (gal): 1-inch well = 0.041 2-inch = 0.16 PURGIN Pump Intake Tubing Mater Volume Purged (liters) Purged Analysis/Method Purged Analysis/Method	1-inch well = 0.041 2-inch = 0.162 PURGING DATA	1-inch well = 0.041 2-inch = 0.162 4-inch = 0.65	1-inch well = 0.041 2-inch = 0.162	1-inch well = 0.041 2-inch = 0.162 4-inch = 0.653 1 gal = 3.785 lim

						TO DATA OTT				
MA				Well ID:	Mu	4	电性表表生表	Job Number:	gourn	
74	Casa	adia		Client:	Nu Ster			Date: 11/14)
20	Associat	es. LLC		Project:	GUON	1 4020		Sampler: 100		
Survey Albert	7.0300101	03, 220		Weather:	R	ain		Time In/Out:	1045.	-1120
					WELL	DATA	Trumpel Co.			
Monument Ty	no:	Flush-mount,	/Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	
onument ty	pc.	Other:			Well Depth:		-	Free Product	Thickness:	
Monument Co	ndition:	2,000)		Depth to Wa	ter:	18121	Water Colum		Commen
Well Cap Lock		Yes No			Screened Interval:					2.1
	rieseiit.	res			Screened Into	erval:		Purge Volume		
Comments:	()4/ 5 11									
The second secon		eight) X (Multip								
Water height	multipliers (g	gal):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
Purge Method			0- 101		PURGIN			2016		
Sampling Met			peri	11	Pump Intake			MS	0)
ampling wet	nou:	Cumulative	(m)	Slow	Tubing Mater	rial & Type:	6	DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1050			1881	75	7.04	17.51	503	2.04	-22.0	c.le
10-2			19, 15	.7	726	10 56	300	291	-71 1	0-000
103)			1 1 1 1 1	.4	1.67	16.51		211	- 66.19	
1056			19,89	1	7.03	12.61	207	2.86	-126	
1059			20.50		6.94	12:10	196	7=4	4.	
1100		10.50				1774	2 0	7 4 6	40	8
1100			W.D.	4	6.96	16.44	190	759	10.2	9
					7					
							Marie 48		F IPS TALLS I	
								234	21-12-13-1	
			f-Huzz			100 - 110				Water a
			Parket (A)		12.557	86				
		Page 1								
			Entrie Fall		10.70.48		Tayre	Bar Holos		
			1.700							是世界自分子建立
HALE SEATING		1 ,84 /	1 0	12 Carlot 18 18 18 18 18 18 18 18 18 18 18 18 18		IG DATA				1
Sample ID:		INV	M-8	Sampling Flo		1		Analytical Lab		HPRX
Sample Time:		116	16	Final Depth 1			10	Did Well Dew		No
No. of Contain	ners/Type	Prese	eservative Analysis/Met			Field Filtered	Filter Size	MS/MSD	Duplicate ID	
15×1	10	H			36	tparent of the same of the sam				
-7 ×	11.	HE TH		24		2011		Mary Carlot		
61	11			47						
				Brown R.						
		10 4 10 10	11.2	18 (18)				100	- A(65),01 - 251	
	Sec. Sec. 19		de market	N	OTES/ADDITIO	NAL COMMEN	TS			
			419 19			Alan Galleria				
				104						

		TARBEL ST		Well ID:	Mu	1-80		Job Number:		
42	Case	adia		Client:	15451	er Van	nex	Date:	11/16	
9	Casc	dala		Project:		n 4020		Sampler:	111	
	Associate	es, LLC		Weather:	Rai			Time In/Out:	11/20-	1200
					WELL			Time my out:	1120	Tac
		Flush-mount/	Stick-up		Well Diamete		TV	Depth to Free	Product:	
Nonument T	ype:	Other:	^		Well Depth:			Free Product 1	,	
Monument Co	andition									
		70	nod _		Depth to Wat		10.61	Water Column		
Vell Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume	: 6	
omments:										
		ight) X (Multip								
Vater height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 lit	ters
			4		PURGIN	G DATA				
urge Metho		pe	٧١,,		Pump Intake	Depth:		MS	5	
ampling Me	thod:	lo	WKlon	5	Tubing Mater	rial & Type:	6	DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рΗ	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
117.4			18.29	.25	6.54	17.11	97	20,45	114.3	elow
11:20	See See See	1	2	,	6.68	12.25	1111	201		200
1161				1		16.00	119	1.74	1152	44
1130					7.20	12,41	129	4.74	115.3	
1133					7.42	12.47	135	275	109.4	
						10,16		7.44	1 1	
1136			-		7.47	16.91	138	- 11	104.1	
1139				1	7.50	12.48	139	2.36	102.7	
							4,99,600			
						(2)				
						7	MARINE S			
				1						
		Take in the					Maria de la		5 / W 6 Y	
									6.000	
0.7								F e day u		
			E 12 (12.3)		N. St.					
			8 7 7 18				101			
	Magazani				PURGIN	IG DATA			40014-375	A
Sample ID:		MM	-80	Sampling Flo		. 2.	5	Analytical Lab	oratory:	Appe
Sample Time		113	9	Final Depth		18.	29	Did Well Dew	ater:	No
No. of Conta	iners/Type	Prese	rvative	Analysis/Me	thod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
34	40	H	00	1	00	~		2		
2	11	11	0 0	-	211					
LX	1	H	U	1	rtt	<u> </u>				
				17,141,1			1444			
				A Charts						
Mar In		A PARTY OF THE								
		4				A STATE				
							the specific			
Marine)				N	OTES/ADDITIO	NAL COMMEN	TS		All materials	
					S-YME				1872 N	
			4	Ac Hills						
					4					

						IG DATA SHI	EI			
MA				Well ID:	MW.			Job Number:		
44	Casc	adia		Client:		Nu Stran	Variant	Date:	11/16	
7	Associate	es. ILC		Project:	Gur	M yaz	0	Sampler:	400	
Control of the Control	715500101	00, 220		Weather:	Rosi	n 50		Time In/Out:	1209	5-1240
in alua		6			WELL	DATA				
Monument Ty		Flush-mount/	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	-
nonument ry	pe.	Other:	2		Well Depth:		-	Free Product 1	Thickness:	
Monument Co	andition:	Nooi)		Depth to Wat	· OF:	AMAG			-
							100	Water Column		
Vell Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume		
Comments:										
		ight) X (Multip								
Vater height	multipliers (g	gal):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
					PURGIN	The second second second				
urge Method		193	W1		Pump Intake	Depth:		MS		
ampling Met	hod:	2	on Ku	W	Tubing Mater	rial & Type:	1	DPE	NEW	/) DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	pН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
11.17			20.69	.25	752	1111	11/2	1151	70.3	
10.			000	, 00	5 10	1617	17)	610 31		clev
145				1	7-16	12.56	P318	6.05	74-6	
1218					6.77	13.00	123	4.45	91:0	-
1221		in the second			6.72	1215	121	4.34	99.0	
1001						1000		1.5		
1224			•		6.70	13.20	120	4.29	103.1	4
						4				
1		BANKET LIVE	are though			Charles III				
						11-11-11	Bellin	Way you you	48,0445.1	
			48-4-008		Saul Act				THE CHAIR	
. ,										
1						Control of the			D. W. D. L. W.	
									25.75-11	
								12.3K Oce	- M-188 - 1	
					PURGIN	G DATA	E. Bres			
Sample ID:		I WIN.	- 9	Sampling Flo			5	Analytical Lab	oratory:	Down
Sample Time:		127	Lu	Final Depth t			09	Did Well Dew		No
No. of Contain			rvative	Analysis/Met		00.	Filter Size	MS/MSD	Duplicate ID	
2	137	11030	0.0	7		I reid i intered	1. 11.01 3120	1.413/14130	Suplicate ID	
27	70	H	U	70		Marie Contraction	-	Transfer of the secondary and		
2x	12	N	0)+	D	×				24-160	787
	THE P	HAR IN	1	P						
					7					
		100								
	150								Here that	
				13 15.00						
Water pure 4				NO	DTES/ADDITIO	NAL COMMEN	TS			
						REPORT I				17/2/2017
			1000				The same of the sa			

				Well ID:	Mu	~~ <u>1</u>		Job Number:		
AL	C	- d: -		Client:	1	510 1/0	Mer	Date:	11/10	0
	Casc	aala		Project:	Qu		7 Der	Sampler:	12/16	5
7	Associate	es, LLC		Weather:	ga	in 90°				1320
			1	weather.	WFII	DATA		Time in/Out:	1250-1330	
		Flush-mount/	Stick-up		Well Diamete		10	Depth to Free	Draduati	
Monument Ty	pe:	Other:	otion ap							
	- dist	1			Well Depth:		10 10	Free Product		
Monument Co		9000			Depth to Wa	ter:	12.40	Water Colum	n Length:	
Well Cap Lock	Present:	Yes No			Screened Into	erval:	_	Purge Volume	:	-
Comments:										
Purge Volume	The second second									
Water height r	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	TOTAL CONTROL	4-inch = 0.65	3	1 gal = 3.785	iters
			1		PURGIN	The second secon				
Purge Method		P	evi		Pump Intake			MS	0	- 047
ampling Meth	hod:	Le	WKgo	w	Tubing Mate	rial & Type:	L	DPE	NEW	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1257			12-40	.25	6.78	13.27	348	20.14	143.2	cleer
1300			12/10		6.89	13.67			139.7	
1200			10 11-		0.01		571	12.10		
000			12.45		+,01	13.69	645	5.01	120.2	
1306			12.45		7.13	13.66	684	2.25	97.5	
1309			1		716	13.65	695	2.14	079	
1211		200	9		7.1.7	1	~		0401	
1011					7.17	13.64	701	2.10	85.1	4
		Manufacture in						EAST-Y	HELL THE	
		Ava III (1)								
										Section 5
			Page 1							
						IG DATA				
Sample ID:		MW		Sampling Flo		. 2		Analytical Lab		Apex
Sample Time:		131		Final Depth t		12.0	12	Did Well Dew		No
No. of Contain	ners/Type	Preservative Analysis/M				Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3×	40			VE	00					
2×	14	14	Ce	TF	4					
Harrier .				1 10					E AVAIL	
					SHALLE					G-16 (C-17), NA
								THE HELDE		
				NO	OTES/ADDITIO	NAL COMMEN	TS			
				NO	OTES/ADDITIO	NAL COMMEN	TS			
				NO	DTES/ADDITIO	NAL COMMEN	TS			

				Well ID:	MI	J-10		Job Number:		
43	Case	adia		Client:	Nu	Star		Date:	11/16	
	Associate	aulu		Project:	Gin	M 492	.0	Sampler:	455	
	Associate	es, LLC		Weather:	PtC	landy		Time In/Out:	1400-	1440
		1	1		WELL			ranie my oue.	1900	711
	/	Flush-mount/	Stick-up		Well Diamete	er:	7"	Depth to Free	Product:	
Monument Ty	ype:	Other:			Well Depth:		-	Free Product		
Monument Co	ondition:	Con	0		Depth to Wat	ter:	19.24	Water Column		
Well Cap Lock		Yes No	100				1116			
	riesent:	res No			Screened Inte	erval:		Purge Volume		
Comments:		: -1 +1 \ / (A A 1+1	1: \\/ (11.6 \)							
		ight) X (Multip						111111111		
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
Purge Metho	4.	0.			PURGIN			- 0 -		
Sampling Met			241	1	Pump Intake			MS	1	1
Sampling Ivie	inou:		niflea	7	Tubing Mater	rial & Type:	L	DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1408			19.24	. 25	6.75	1265	620	1015	40.7	elisen
1411			2		7.04	12.75	- 0	71.0	57.9	000
11111								7.65	01.1	
1414					7.08	13.01	235	4.07	70.9	
1417					7.06	13.10	223	3.78	84.8	
14/20	# Flangs								27 9	V
1-110				1	7.06	13.12	219	3.71	04.1	
					STATE OF					
			6, 17				Mary Control			
				1 1 1						
					T-12-15-11					
				112					P9-17-19-19-19-19-19-19-19-19-19-19-19-19-19-	
Buy- Title				ALUE A				17		
									4	
						Market set				
					No. of Concession, Name of Street, or other Designation, Name of Street, or other Designation, Name of Street,	IG DATA	Charles A. Ca			
Sample ID:		Mu		Sampling Flo			5	Analytical Lab		Apex
Sample Time			20	Final Depth t			24	Did Well Dew		No
No. of Contai	ners/Type	Prese	rvative	Analysis/Met	thod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
3×	40	MC	· l	V	00					
70	11	111	0	+1	01					
UY	1	1	^	1	B					
									Marie 1	
									Lucita de la	
						Maria Cara				
E SHOWN	Maraika Like	My Gelder J.		NO	OTES/ADDITIO	NAL COMMEN	TS	Materials.		State Lister Lines.
Parl of La										
			M. Alleria							
							100			

				Well ID:	WI	1)-7		Job Number:	,	
42	Case	adia		Client:	7 7 7	St con V	mere	Date:	11/17	A Company of the
	Casc	adia		Project:	6.1	m 46		Sampler: AW		
7	Associate	es, LLC		Weather:	17	in.		Time In/Out:	730 -	630
				West inci.	WELL			Time myout.	770-	0)
	1	Flush-mount/	Stick-up		Well Diamete		1	Depth to Free	Product:	
Nonument Ty	pe:	Other:	Λ		Well Depth:			Free Product		
Monument Co	ndition	170 (0.00)	1)				76 00	 		
		Good	CX		Depth to Wat		23.30	Water Column		
Well Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume		
Comments:		,						**		
		ight) X (Multip								
Vater height i	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	53	1 gal = 3.785 li	ters
					PURGIN	IG DATA				
urge Method		V	en		Pump Intake	Depth:		W/S		
ampling Met	hod:	lo	when	J	Tubing Mate	rial & Type:	i	DOE	NEW	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
7511			18,30	.25	1, 60	1379	117	11212	2475	4000
201			1010	1 1		12 00	014	0 10	Rad I	Color
134					4.80	1900	111	D = 4 3	2341	
757				1	6.99	13.37	225	14.92	361.4	
200TD					7 10	13 41	713	702	2502	
0-2					7 11	19.51	0 0	LOT	610,1	
007					1.11	13:49	209	465	Telet.	
806				1	7.11	13,50	206	7.10	241.6	1
									The second	
						300 300				
							4 3 - 1			
			N. C.							
									A CONTRACTOR	
					PURGIN	IG DATA				A
Sample ID:		Mu		Sampling Flo	w Rate:	- 7	25	Analytical Lab	oratory:	Apri
Sample Time:		804	7	Final Depth 1	o Water:	78	82	Did Well Dew	ater:	No
No. of Contair	ners/Type	Prese	rvative	Analysis/Me	thod	Field Filtered		MS/MSD	Duplicate ID	
3.11	ID .	1	11	1/0	00			-		
1	10	11	10	V	214				a transference	
L7	1	Ha		1	YD				The production of	
						March 1	-			
							TC			
			St. A line is	N	OTES/ADDITIO	NAL COMMEN	12			
				Ne	OTES/ADDITIO	NAL COMMEN	15			
				No	OTES/ADDITIO	DNAL COMMEN	12			

		0.041	Well Diamete Well Depth: Depth to Wall Screened Inte 2-inch = 0.16 PURGIN Pump Intake Tubing Mater	er: ter: erval: 2 G DATA Depth:	17.35 4-inch = 0.65	Purge Volume	Product: Thickness:	ters DEDICATED Clarity/Color Other Remarks
Flush-mounty Other: Explosion (See No) The see of the	lier) X (# Casir 1-inch well =	Project: Weather: ng Volumes) 0.041 Purge Rate (L/min)	WELL Well Diamete Well Depth: Depth to War Screened Inte 2-inch = 0.16 PURGIN Pump Intake Tubing Mater	DATA er: der: erval: 2 G DATA Depth: rial & Type: Temp (°C)	17.35 4-inch = 0.65	Sampler: Time In/Out: Depth to Free Free Product T Water Column Purge Volume 3	Product: Thickness: Length: I gal = 3.785 li	ters // DEDICATED Clarity/Color
Flush-mounty Other: Explosion (See No) The see of the	lier) X (# Casir 1-inch well =	Meather: Ing Volumes) 0.041 Purge Rate (L/min)	WELL Well Diamete Well Depth: Depth to War Screened Inte 2-inch = 0.16 PURGIN Pump Intake Tubing Mater	DATA er: der: erval: 2 G DATA Depth: rial & Type: Temp (°C)	17.35 4-inch = 0.65	Depth to Free Free Product T Water Column Purge Volume	Product: Thickness: Length: I gal = 3.785 li	ters // DEDICATED Clarity/Color
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er Height) X (Multipers (gal): Cumulative Volume Purged	1-inch well =	O.041 Purge Rate (L/min)	Screened Intercept 2-inch = 0.16 PURGIN Pump Intake Tubing Mater	2 G DATA Depth: rial & Type: Temp (°C)	4-inch = 0.65	Purge Volume 3 MS PE DO	1 gal = 3.785 li	ters // DEDICATED Clarity/Color
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Cumulative volume Purged	1-inch well =	O.041 Purge Rate (L/min)	PURGIN Pump Intake Tubing Mater	G DATA Depth: rial & Type: Temp (°C)	Cond	NS PE DO	NEW ORP	/ DEDICATED Clarity/Color
ne Cumulative Volume Purged	DTW	Purge Rate (L/min)	PURGIN Pump Intake Tubing Mater	G DATA Depth: rial & Type: Temp (°C)	Cond	NS PE DO	NEW ORP	/ DEDICATED Clarity/Color
ne Cumulative Volume Purged	DTW	Purge Rate (L/min)	Pump Intake Tubing Mater pH	Depth: rial & Type: Temp (°C)	Cond	PE DO	ORP	Clarity/Color
ne Cumulative Volume Purged	DTW	Purge Rate (L/min)	Tubing Mater	Temp	Cond	PE DO	ORP	Clarity/Color
volume Purged	DTW	Purge Rate (L/min)	рН	Temp (°C)	Cond	DO	ORP	Clarity/Color
volume Purged		(L/min)		(°C)				
S) Purged	(btc)	(L/min)		(°C)				
(liters)	17.35	7,2	+/-0.1			-		
	17.35	7.2	+/-0.1	4/05°C		Design Street	14.1	
	17.39	7.2	# / /	T/*U.5 C	+/-5%	+/-0.5 ppm	+/-20 mV	
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		30	6-47	13.60		3.65	206.1	* * * * * * * * * * * * * * * * * * * *
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	pe Prese	410	Sampling Floring Final Depth to Preservative Analysis/Me	PURGIN Sampling Flow Rate: Final Depth to Water: Analysis/Method HCL HCL TPH	PURGING DATA— Sampling Flow Rate: Final Depth to Water: Preservative Analysis/Method Field Filtered FILE FINAL DEPTH FINAL DEP	PURGING DATA Sampling Flow Rate: Final Depth to Water: 74,35	PURGING DATA Sampling Flow Rate: Final Depth to Water: Preservative Analysis/Method Field Filtered Filter Size MS/MSD HCL HCL TPH PURGING DATA Analytical Lab Final Depth to Water: / 7,35 Did Well Dew MS/MSD	PURGING DATA PURGING DATA Sampling Flow Rate: Final Depth to Water: Preservative Analytical Laboratory: Did Well Dewater: MS/MSD Duplicate ID HCL TPH TPH TOTAL SAMPLED DID WELL DID W

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			Well ID:				Job Number:	7		
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sociale	ss, LLC		Weather:	17				930-	-1015	
	Flush-mount/	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	-	
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ent:	Yes			Screened Inte	erval:	Outstanding	Purge Volume	::		
Vater He	ight) X (Multip	lier) X (# Casi	ng Volumes)							
ipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters	
				PURGIN	G DATA			ENVIRON SERVICES		
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				+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
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	cion: sent:	other: sent: Yes No Water Height) X (Multip cipliers (gal): Cumulative Volume Purged (liters) (liters)	Flush-mount/stick-up Other: ion: sent: Yes No Water Height) X (Multiplier) X (# Casi cipliers (gal): Cumulative Volume Purged Purged (btc) (liters) 19 31	Client: Project: Weather: Flush-mount Stick-up Other: Sent: Yes No Water Height) X (Multiplier) X (# Casing Volumes) Clipliers (gal): Cumulative Volume Urged (liters) DTW Purge Rate (L/min) 19-31 25 Sampling Florinal Depth	Client: Project: Weather: Well Diameter Well Depth: Depth to Wassert: Ves No Water Height) X (Multiplier) X (# Casing Volumes) Clipilers (gal): 1-inch well = 0.041 Purggin Cumulative Volume Urged Purged (liters) Purged (liters) Purge Rate (L/min) 19 31 19 35 19 53 19 59 Purgling Flow Rate: Final Depth to Water:	Client: Project: GwM dQ TO Well Darnater: Well Darnater: Well Depth: Depth to Water: Sent: Ves No Screened Interval: Water Height) X (Multiplier) X (# Casing Volumes) Screened Interval: Water Height) X (Multiplier) X (# Casing Volumes) Purging DATA Pump Intake Depth: Tubing Material & Type: Olume Unged (liters) Purged (btc) (L/min) PH Temp (°C) Purged (liters) PH Temp (°C) PH Temp (°C) Purged (liters) PH Temp (°C) PH Te	Client: Project: GLM 4020 Weather: WELL DATA Flush-mount/stick-up Other: Well Depth: Depth to Water: Z Sent: Yes No Screened Interval: 7.3(Water Height) X (Multiplier) X (# Casing Volumes) Sipliers (gal): 1-inch well = 0.041 2-inch = 0.162 4-inch = 0.65 PURGING DATA Cumulative Volume UTW Purge Rate (L/min) PH Temp Cond (µS/cm) (liters) PURGING DATA 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Client: Project: Sampler: Sampler: Weather: WELL DATA Flush-mount/stick-up Well Dameter: Z Depth to Free Product Sent: Yes No Screened Interval: Purge Volume Water Height) X (Multiplier) X (# Casing Volumes) Spliers (gal): 1-inch well = 0.041 Purge Rate Purged (liters) Cumulative Volume Urged (liters) Purge Rate (L/min) Purge Rate (L/mi	Client: Project: Gum Quarter Sampler: Gum Quarter Gum Quarte	

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w.d-				Well ID:		W-4		Job Number:	1		
Cascadia				Client:		Ster Ve	unex	Date:	11.//	T	
7	Associat	es. LLC		Project:	Gusy	M 4Q2	0				
CONTRACTOR OF THE PARTY OF THE				Weather:	Ken			Time In/Out:	1020	-1100	
		5	1		WELL	DATA					
Monument Ty	vpe:	Flush-mount,	Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	-	
		Other:	Λ		Well Depth:		-	Free Product	Thickness:		
Monument Co	ondition:	900	V		Depth to Wa	ter:	30.931	Water Columi	n Length:		
Well Cap Lock	Present:	Yes No			Screened Int	erval:	-	Purge Volume			
Comments:	<							Transc volunie			
Purge Volume	e = (Water He	eight) X (Multip	lier) X (# Casir	ng Volumes)							
Water height			1-inch well =		2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters	
						IG DATA	14 men = 0.03		1 gai - 3.763 i	iters	
Purge Method	d:	4	EVT Blo	udder	Pump Intake			MS		0	
Sampling Met	thod:		1 ///	nJ.	Tubing Mate		4	BB	NEW	/ DEDICATED	
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
1024			30,84	3	7.64	13.20	379	6.10	-104.1	cleur	
1027			1		7,04	13.55	325	4.53	-51.6	cour	
1030					6.90	13.50	310	3.17	-30,5	the second	
1033		ST. T.				3.0			21.5	43	
- 1					6.89	13.47	304	2.65	-24.0		
1036				ME SH	6.86	13.52	304	2.19	-22.7		
1039					16.06	13.52	302	1.95	-22.0		
11342					6.87		302	1.721	-017		
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				Well ID:	1	NG DATA SHE	EEI	le con e			
44	_	1.		Client:	ATV	W-3		Job Number:	111.		
	Casc	adia			Nu	Ster Very	nea	Date:	11/17		
7	Associat	es, LLC		Project:	1 GW	M 402			Zw		
				Weather:		n .		Time In/Out:	1150-	-1145	
		161	10/1		1	DATA	4.5	Asset Market			
Monument T	ype:	Flush-mount/	Stick-up		Well Diamete	er:	20	Depth to Free	Product:		
	-	Other:	1		Well Depth:		E	Free Product 1	Thickness:		
Monument C	ondition:	and			Depth to Wa	ter:	30.03	Water Column	Length:	CONTRACTOR OF STREET	
Well Cap Lock	k Present:	Yes No			Screened Int		0000	Purge Volume			
Comments:		110			ocieened inc	ervar.		raige volume			
	0 = /\Mater He	eight) X (Multip	lion) V /# Coolin	- \ / - l \							
					2: 1 046						
vater neight	multipliers (g	gai):	1-inch well =	0.041	2-inch = 0.16	The second secon	4-inch = 0.65	3	1 gal = 3.785 li	ters	
urge Metho	d.	1 61	adder		-	IG DATA		MS		- Contract of the Contract of	
ampling Me					Pump Intake				1		
ampling ivie	triou:		WROW		Tubing Mate	rial & Type:	5	3	NEW	DEDICATED	
	Volume	Cumulative Volume	DTW	Durgo Poto		T	6.1	200	0.00	Chair /Ch	
Time	Purged	Purged	(btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond	DO (nnm)	ORP (m)()	Clarity/Color Other Remarks	
	(liters)	(liters)	(Dic)	(4/111111)		(°C)	(μS/cm)	(ppm)	(mV)	Other Remarks	
5 9 13 14		and the state of t	(SECTION)		+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	JN 57 JOSEPH SELECTION	
1109			20 07	2				010			
1109			30.03	,3	4.86	13.06	290	8.69	27.6	clair	
1112			30.19		6.91	1332	281	5.62	28.4		
1115			30.24		6.90	13.49	274	3.52			
1113						1			21.7		
1118			30.35		6.90	13.62	222	1.99	20.9		
1121			30.44		6.90	13,59	276	1.78	20.0		
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BEHAVET IN		ger The Mis-	-148-1-2	NO	OTES/ADDITIO	NAL COMMEN	TS				
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				WELL Well ID:	MONITORII	NG DATA SH	EET				
MA	Cascadia				MI	1-6		Job Number:			
3						Sting Va		Date:			
7	Associat	es, LLC		Project:	GW	m 40	Sampler: Time In/Out: 115		40	W	
				Weather:	Ka	in					
		In 1	(Cut 1		VIII	DATA	I in				
Monument T	Monument Type:		/Stick-up		Well Diamete	er:	25	Depth to Free			
14 16		Other:			Well Depth:			Free Product	Thickness:		
	Monument Condition:		<u> </u>		Depth to Wa		19.02	Water Colum	n Length:		
Well Cap Lock	Present:	Yes No			Screened Int	erval:	-	Purge Volume	e:		
Comments:	1)4/-4 1)		ti turing i								
		eight) X (Multip									
Water height	multipliers (g	gai):	1-inch well =	0.041	2-inch = 0.16	IG DATA	4-inch = 0.65	3	1 gal = 3.785 l	iters	
Purge Method	d:		Davi		Pump Intake			MS			
Sampling Met			17	1	Tubing Mate		13	PE	MEM	PEDICATED	
I NEW TO		Cumulative	- Kun	1 Ver	Tabling Wate	That of Type.	6	7,00	NEW	DEDICATED	
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks	
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV		
1202			14.02	"2	6.96	13.38	690	7.27	26.0	chied	
1205			19.99	1.2	701	13.46	817	43.2	-9.9	(
1708			20,10	# 125	7.14	13.85	981	1.01	-974		
1211			20.36	1	714	13.90	991	.92	-103,3	Frank Grand	
1214			20.65		7.14	13.92	992	.90	-1042		
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103.714.13									35.46		
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Sample Time: No. of Contair	total and the same of the same	16	14	Final Depth t		21.	04	Did Well Dew		N	
O COntain	*	Prese	rvative	Analysis/Met	nod	Field Filtered	Filter Size	MS/MSD	Duplicate ID		
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Project: GWM 1Q ZD

Client: Nu Stan Vannes
Sampler:

Date: 2/24
Permit: 9996

Sampler: (10	45			1104	dr by
Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:	
MW-9	705		21.03			
MW-80	709		17.79			
MW-8	7.15		17.38			
MW-50	719		16.62	7		
MW-5	722		17.00		Var and	. 2
MW-10	731	e .	18,57	À		br .
MW-1	743		16.24			
MW-11	751	4.5	4.20			· · · · · · · · · · · · · · · · · · ·
MW-3	756		28.76			
MW-4	801		29.77			
MW-2	804		27.91			
MW-4	812	-9-7C	11,14			
MW-7	Bile		11.49			
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						10.00
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1				Well ID:	Mw.	7		Job Number:		
Cascadia Associates, LLC				Client:	Nu Sto	is Vans	ex	Date:	2/24	
100	Associate	as IIC		Project:	Gum	1920	7 1	Sampler:	1-10	
- victor	7133001411			Weather:	Cloud	y ~ 45	0	Time In/Out:	835 -	920
		1			WELL		104			
Monument T	vpe:	Flush-mount/	Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	/
	,,	Other.	Δ		Well Depth:		_	Free Product 1	Thickness:	Manager of the London
Monument C	Condition:	9,000	y		Depth to Wa	ter:	11.49	Water Column	Length:	Mindelity (Const. of Principles of Principle
Well Cap Loc	k Present:	Yes No			Screened Into	erval:		Purge Volume	:	
Comments:				***************************************						
Purge Volum	e = (Water He	ight) X (Multip	lier) X (# Casir	ng Volumes)			4	5		
Water height	: multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 li	ters
					PURGIN	G DATA				
Purge Metho		1	20,		Pump Intake			MS	-	
Sampling Me	thod:				Tubing Mate	rial & Type:	LD	PE	(NEW)	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
842			11.49	0.2	4.63	12,53	569	14.23	31.4	elevi
2:05			11.49		2 11	12.69	566	11.07	28.0	
20 10			M'acc		6.61	10101	100		1	1
048	-		-		6.57	12-43	530	7.27	23.0	
851	2.7	12			6.54	12.81	547	4.01	22:6	
854					6.49	12.87	541	3.72	25.6	
9-1			4-5	1	1 111.		539	3.67	192	
05+		-	*		6.46	12.98	331	3.607	11.	
		-			1		1			
								3		
					1	1.	1		,	
						S.				1.0
					2	2		i i		
								ļ		
									5.535	
									-	
					PURGIN	IG DATA		-		1 (56)
Sample ID:		MW	7	Sampling Flo	THE RESIDENCE OF THE PARTY OF T	2	/	Analytical Lab	oratory:	Apix
Sample Time	:	85		Final Depth 1		11.5		Did Well Dew		No
No. of Contai		~ ~	rvative	Analysis/Me		Field Filtered		MS/MSD	Duplicate ID	
2-	11-	Lli	R		TA TA					
7.	40	111	0	NO					 	
24	40	11		10				-		
				1						
							-		1	
					OTEC/A DOIT!O	MAL COMMATA	ITC	ot		
				N	OTES/ADDITIC	NAL COMMEN	112			2
							•			-
					200	1.				
					30	1				

. 4				Well ID:	MW-	10		Job Number:	1	
明金	Casc	adia		Client:	Nusta	w Vorme		Date:	2/4	\
110	Associate	adia es, LLC		Project:	GWM	1220		Sample	12/4	9
	Associate	35, LLC		Weather:	Clou			Time In/Out:	930	1015
					WELL	DATA				
Manus		Flush mount/	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	**************************************
Monument T	ype:	Other:	0		Well Depth:		_	Free Pr	hiclmess:	_
Monument C	ondition:	als			Depth to Wa	ter:	18.57	Water		
Well Cap Loci	Present: A	Yes No	<i>r</i>		Screened Into		~ 37	Purge Volume		
Comments:	CT resent.	TC3/O NO			Joer Cerred III	Civai.		I dige volunie	•	
	0 = /\Mater He	ight) X (Multip	lior\ V /# Casis	ar Volumos)		I				
	multipliers (g		1-inch well =		2-inch = 0.16	2	4-inch =		1 44 - 1 705 0	11.0
water neight	muniphers (g	aij.	1-inch wen =	0.041	PURGIN		4-111011 -			
Purge Metho	d:	0	00		Pump Intake			V1 5		
Sampling Me		8	7		Tubing Mate		(_X	PE	1	X
		Cumulative	6		Tabilig Wate	1				
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (pipm)	ORP (mV)	Clarity/Colorly Other Remark
					+/-0.1	+/-0.5 °C	+/-5		-247-20 mV	
939			18,57	,2	7.12	12.95	76	27 6	32 6	cur
947				3 0	6.96	1	134	1	75	(2)3
2 1/2			18,61		1 1.1	12.8-1		17.30		
947	j.		18.61		6.14	12.91	115	10 91	91.	
948			18.62		5.79	12.87	100	9.31	94.9	
951			18,62		6.0)	12.87	99	9.22	959	
			10,60				 			
954			-		5.99	12:39	99	9.19	96	
										April 10 P
					PURGIN	IG DATA				1 1111
Sample ID:		MW	010	Sampling Flo	w Rate:		2	Analytical Lab	oratory:	Spex
Sample Time	:	45	4	Final Depth t	o Water:	18.	65	Did Well Dew	ater:	Ne
No. of Contai	ners/Type	Prese	rvative	Analysis/Me	thod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	1000
2 ×	IL	H	il .	-						
7	1	+								
JX	40	/7 (1							_
				-				-	-	
				NO	OTES/ADDITIO	NAL COMMEN	TS			
										

N. 4-				Well ID:	MW	~5		Job Number:	1	
46	Casc	adia		Client:	Na	Star Va	mes	Date:	2/24	
444	Associate	s IIC		Project:	GW	M 1020) '	Sampler:	10	
	Associate	a, LLC		Weather:	(1	onde		Time In/Out:	1025 -	1105
		7			WELL	DATA				
		Flush-mount/	8tick-up		Well Diamete	er:	2"	Depth to Free	Product:	V
Monument T	ype:	Other:			Well Depth:			Free Product 1		And the state of t
Manue	on diti		-0				17			-
Monument C		gra	1		Depth to Wa		17.00	Water Column		
Well Cap Lock	Present:	Yes) No			Screened Inte	erval:	-	Purge Volume	:	
Comments:										
Purge Volume	e = (Water He	ight) X (Multip	lier) X (# Casin	g Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 li	ters
					PURGIN	G DATA				
Purge Metho	d:		PVO		Pump Intake	Depth:		M	5	
Sampling Me	thod:		LY.		Tubing Mater	rial & Type:		LOPE	(NEW	/ DEDICATED
	- 17.1	Cumulative	U							
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1034			17.00	2	5.89	12.38	81	17.04	139.3	00
-			-	,				1	1	Clear
1037			17.15		5.91	12.40	123	13.29	135.4	1
1040			17.25		6.35	13.49	490	3.04	-20.2	
1043					le.40	13.52	499	2.74	- 26.6	
1			17,33						, ,	
1046			17.38	9	6.43	13,53	26	12/61	-36.	T
	. 6				N. C		506			
									- 22	
									12.2	
									7.1	
									7	
									5 - 5	
					-	 	-		-	
										T.
										_ 87
	<u> </u>			<u> </u>	D. 10.011	C DATA	L	1		
Camel-15		Ι.ΑΛ. \	5	C !: 5'		IG DATA		Ameliate 11 1	arata	1000
Sample ID:		MW	7	Sampling Flo		1	D-3	Analytical Lab		Men
Sample Time		104		Final Depth t			81	Did Well Dew		Ne
No. of Contai	ners/Type	Prese	rvative	Analysis/Met	thod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
ZX	1	1 H		TP	H					V
231	in	ill	0 3	51	201					
NY C	10	1 11		1 0				-		
							1	 		

				NC	TES/ADDITIO	NAL COMMEN	TS			
					711	April 1				
						NE.				
0										

N. A.				Well ID:		-51)		Job Number:	1	
A 2.	Caso	adia		Client:	Nus	ten Vonn	عصو	Date:	2/20	
1	Associat	es. LLC		Project:	GLIN	1 1922		Sampler:	142	3
				Weather:		ndy		Time In/Out:	1110-	1150
			}		WELL	-				
/lonument T	vpe:	lush-mount	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	_
	/ /	Other.	Δ		Well Depth:		-	Free Product	Thickness:	Managarite
Monument C	Condition:	agro (<i>y</i>		Depth to Wa	ter:	16,62	Water Column	Length:	· ·
Vell Cap Loc	k Present:	Yes No			Screened Inte	erval:	_	Purge Volume	: ' '	_
iomments:										
urge Volum	e = (Water He	eight) X (Multip	olier) X (# Casir	ng Volumes)						
/ater height	t multipliers (g	gal):	1-inch well =	0.041	2-inch = 0.16	THE RESERVE THE PERSON NAMED IN COLUMN	4-inch = 0.65	53	1 gal = 3.785 li	ters
					PURGIN			17		
urge Metho		F	9,		Pump Intake		^	17 17		
ampling Me	thod:	1	4)		Tubing Mate	rial & Type:	Li	PE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1114			16,62	.2	6.52	12.95	511	24.47	-58.5	cloudy
1117			16.62		6.62	13.01	4/2	9.78	-48.9	cleer
			14.60		6.77	13.20	309		- 34.3	lieuv
1120	-							3.32		
123					6.81	13.27	287	2.21	-22.5	
1126					6.81	13.78	285	2.19	-20.9	
1129			4	1	6.82	13.29	284	2.14	-2011	4
1						13.0			<u></u> σ- χ ·	
										120
										
	-	 					1			
						G DATA				4
mple ID:			1-57	Sampling Flo		.2		Analytical Lab		Apax
imple Time		1	19	Final Depth t			45	Did Well Dew		'N'
o. of Contai	iners/Type	Prese	rvative	Analysis/Met	hod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
LX		1	Ce	TP	H					~
3	40	1-	til	VO	C	1				
		1								
				 				-		
								-	-	V 3
				NC	TES/ADDITIO	NAL COMMEN	TS			

				Well ID:	MI	1.8		Job Number:	1 1	
43	Case	nihn		Client:		StewVan	no	Date:	2/24	
400	Accoriate	cadia es, LLC		Project:	Gus		0	Sampler:	100	
making village	Associat	es, LLC		Weather:	Cha	ely		Time In/Out:	1155=	1235
		8			WELL	DATA			Twitten in	
4 T	(Flush-mount	Stick-up		Well Diamete	er:	7~	Depth to Free	Product:	4
Monument Ty	/pe:	Other:	A		Well Depth:		-	Free Product	Thickness:	-
/lonument Co	ondition:	aye	rd		Depth to Wa	ter:	17.38	Water Column	Length:	
Well Cap Lock	Present:	Yes No			Screened Int	erval:	-	Purge Volume		~
Comments:										
urge Volume	e = (Water He	eight) X (Multip	olier) X (# Casir	ng Volumes)						
Vater height	multipliers (g	gal):	1-inch well =	0.041	2-inch = 0.16	52	4-inch = 0.65	3	1 gal = 3.785 l	ters
					PURGIN	IG DATA				100
urge Method			PP.		Pump Intake	Depth:		W/S	1	
ampling Met	hod:		W		Tubing Mate	rial & Type:	W	pt	(NEW	Y DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рH	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1201			17.33	. 2	6.82	11.83	243	20.16	54.1	cloudy
204			17.51		6.22	11.94	142	9.78	48.4.	1
				6	1 .			7 40	1	clear
207			17.62		6.03	12.08	92	1	66.4	Clear
210			17.71	- 8	5,99	12,10	87	7,29	68.6	
1213			17.79	+	5.96	12.11	84	7.23	70.2	+
		1111111111								
							. 9			
				,						
					 					
										
و آدر										
						-				
										1
		ļ				ļ	-			1
	21 18									
					PURGIN	IG DATA				THE LEW H
ample ID:		Mu	J- 8	Sampling Flo	w Rate:			Analytical Lab	oratory:	Anex
ample Time:		121	5	Final Depth t	o Water:	18.	05	Did Well Dew		No
o. of Contair	ners/Type	Prese	rvative	Analysis/Met			Filter Size	MS/MSD	Duplicate ID	
-1	.1	11	0 0	10	14					199
L ×		1	2	11	U					
50	40	1	10	VE	2C	17				
										164
		-					-	+		
										186
	ter una			NO	OTES/ADDITIC	NAL COMMEN	TS			Company of the State of the Sta
						To the				
										1 1872
										A GOVERNMENT

			Well ID:	MI	U-81)		Job Number:	1	
Caso	nihn		Client:	Nu	Star Van	nea	Date:	2/2	4
Associate	es, LLC		Project:	GW	0591 N		Sampler:	400	
			Weather:				Time In/Out:	1240	1-1330
		(c): 1		-		L M	I-		
rpe:		/Stick-up			er:	2"			
	/	1				_	Free Product	Thickness:	_
	W 13			Depth to Wa	ter:	17.79	Water Column	Length:	
Present:	Yes No			Screened Int	erval:	_	Purge Volume	:	_
multipliers (g	al):	1-inch well =	0.041		The state of the s	4-inch = 0.65	3	1 gal = 3.785 l	iters
	1	2-0					111 5		
		70				1	PAS	ALEVAN	/ DEDICATED
	Cumulative	70		Tubilig iviate	Паго туре.	L	310	INEVV	/ DEDICATED
Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
				+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
		17.79	,2	3.61	11.43	71	1807	132.9	deed
		1779	1	6.74	1190		1157		
Will in		1		1 59	1	0 /	1		
				,			6.50	127 , 1	
Mary Control				6.71	12.20		2,64	117.2	
				6.75	12,24		2.61	114.0	
				6.76	12.23	98	2.49	112.9	
	T ac	1	1	A	11 25			117 2	
			141	(.14	11.60	10	10,10	110,0	
						-			
					-				
	4	200							4
	Mh	1-812				76			Agex
ars/Tuno									No-
ers/Type					Irieia riitered	Filter Size	IMS/MSD	Duplicate ID	
1,6	(t)	ll							
40	H	il	VE						
			į.	***************					
						-			
		-							
			NO	TES/ADDITIO	NAL COMMEN	TS			
	Associate pre: Indition: Present: = (Water He multipliers (g) It: hod: Volume Purged	ondition: Present: Ves No = (Water Height) X (Multip multipliers (gal): I: hod: Volume Purged (liters) Cumulative Volume Purged (liters) Gres/Type Preser	Associates, LLC The secondition: Present: Purged: (liters) Purged: (l	Cascadia Associates, LLC Flush-mour/Stick-up Other: Ondition: Present: Yes No = (Water Height) X (Multiplier) X (# Casing Volumes) multipliers (gal): I: hod: Volume Purged (liters) Volume Purged (liters) IT.74 IT.74	Associates, LLC Client: Project: Weather: Well Diamet Well Depth: Depth to Wa Screened Int Well Depth: Present: Well Depth: Depth to Wa Screened Int Well Depth: Depth to Wa Screened Int Well Depth: Depth to Wa Screened Int Purged: Undition: Purged (liters) Analysis/Method	Client: Project: GLW 1920 Weather: WELL DATA Flush-mount/Stick-up Well Dameter: well Depth: Depth to Water: = (Water Height) X (Multiplier) X (# Casing Volumes) multipliers (gal): 1-inch well = 0.041 Purged (liters) Cumulative Volume Purged (liters) Tolume Purged (liters) 17.79 17.79 17.79 17.79 17.79 17.79 17.79 17.79 17.79 17.79 17.75 17.	Client: Project: GLM 1970 Weather: Well Data Project: GLM 1970 Weather: Well Data Present: Well Data Present: Well Data Well Data Present: Tana Present:	Client: Nu Ha Vanna Date: Sampler: Client: Project: GL M QL O Sampler: Time In/Out: Weather: Weather: Well Data Well Data Project: Weather: Well Data Project: Well Depth: Free Product Present: Present: Present: Present: Purge Volume Purge	Cascadia Client: Project: GLYM 170 Sampler: 170 Sampler:

4	793	Pol Care		Well ID:	MW-	9	7	Job Number:	- 100	1
AZ	Casc	adia	y 16	Client:	Nust	er Vous	nex	Date:	2/2	7
	Associate	aulu		Project:	GUN	1020		Sampler:	700	1.10
	Associate	S, LLC		Weather:	Rai	VL		Time In/Out:	13404	1430
TREE A	/	1			WELL	DATA				
	(Flush-mount/	Stick-up		Well Diamete	r:	2	Depth to Free I	Product:	
onument Ty	pe:	Other:	Λ		Well Depth:		-	Free Product T	hickness:	
onument Co		90°L	V		Depth to Wat	er:	21.08	Water Column	Length:	
/ell Cap Lock		Yes No	j. 197		Screened Inte	rval:		Purge Volume:		
omments:	rieseiit.	110			La sult de la company				714-430	
	- (Mater Hei	ght) X (Multin	lier) X (# Casin	g Volumes)				ME		
	multipliers (ga		1-inch well =		2-inch = 0.162)	4-inch = 0.65	3	1 gal = 3.785 lit	ers
ater neight i	narcipilers (86				PURGIN		400.0			
urge Method	:		66	4	Pump Intake	Depth:	100	MY		
ampling Met			2h	130 1	Tubing Mater	ial & Type:	(LDPF	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	BEET PLOTE IN
1248			21,08	2	6.95	12.52	99	13.61	90.9	clear
10-1				4	1 51	17 7	95	710	95.9	
1351		A			6.24	10,70	1)	8 00	10117	
1354			21,15		6.03	13.02	91	8.00	104.4	
1357			21.17		5.99	13.07	91	8.09	105.1	
1400	174	7.5	21.16		5.99	13.08	91	8.04	106-1	
0					5.96	13.12	90	8.14	109.8	-17
1403			21.19		17.16	13.16	10	0.19	101.0	
13						W 4		1	V 8 3	
								1.4		and the second
		5 50 AV				1				
	12/62							7-		The state of the s
	330	ļ			N N	-				1 3
	4. 2	F		4						
	18:	100								4 1
	4	1 27								
		-	-	-	1	1		- 4		
					DITIO	NG DATA		1		188
		1 .001	1-9	Sampling Fl			2	Analytical La	boratory:	Apex
Sample ID:		IVIL	102	Final Depth		2	1,24	Did Well Dev		IN
Sample Time No. of Contai		Proc	ervative	Analysis/Me		Field Filtered		MS/MSD	Duplicate ID	
No. of Contai	mers/ rype	111	CIVALIVE		5 C					
JX	40	H		1	011-				-	
2	XIZ	H	l	1	ru		+			
		-								1-3
				4 3		da .			1	-
	- 4		4						1000	30
	. Tĝ			N	NOTES/ADDITI	ONAL COMME	NTS			
							1			3. 集人
					18					111:
										William
										1.1

4				Well ID:	LAIM	Q,		Job Number:		
AS	Case	cadia es, LLC		Client:	Nusta		ex	Date:	2/25	
400	Associat	es IIC		Project:	GWM	1Q20	4.4	Sampler:	1 gw	
control of the	ASSOCIUI	es, LLC		Weather:	Clou	dy 40°		Time In/Out:	730-	925
		/	1		WELL	DATA				
T	TKant	Flush-mount	Stick-up		Well Diamet	er:	2	Depth to Free	Product:	
lonument Ty	ype:	Other:			Well Depth:		Page 1	Free Product	Thickness:	-
lonument Co	ondition:	good			Depth to Wa	iter:	17.14	Water Colum	n Length:	
Vell Cap Lock	Present:	Yes No			Screened Int	erval:		Purge Volume	e:	Canada Anna
omments:	ARCH. I									
urge Volume	e = (Water He	eight) X (Multip	1							
ater height	multipliers (g	gal):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	53	1 gal = 3.785 li	iters
			00	- 1	-	IG DATA	1	-	. 100 100	
urge Metho		40.0	M		Pump Intake		M		1)
ampling Met	thod:	C Lui	LA.		Tubing Mate	rial & Type:	LDP		NEW NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
134			17.14	.2	6.87	111.19	366	27.01	89.5	clear
139			17.14		7.05	10.74	706	9.13	60.3	
742					6.85	12.03	717	4.04	6.1	
2115	1.70414	A - control			111	1	738	3.10	-	
+47		10.10	- 9		6.77	12.50	1		-19.7	
748					le the	12.58	742	2.95	-20.3	72.68
751			1	A	6.76	12.61	744	2.87	-23.9	
		1 1 7 7					1400		77/01	
	1000		James III						A 45.5	
			Briat B		-50			1981		
					7					
						September 1			and Talk	
										70-
			,			IG DATA				2. 38. 33
mple ID:		MW	-6	Sampling Flo		i,	2	Analytical Lab		Apex
mple Time:		43	1	Final Depth t		17	12	Did Well Dew		, No
o. of Contain		Preser	vative	Analysis/Met	hod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	1000
3x2	10	H	1	VO	(
2x	12	2	()	1	#		-123.411			W SERVICE SERVICE
1179		1		1 1 1 1 1		19				
3.	in	1	()	1/0	1				100A+1 2	2
UX	40	1		00	1				MM-6	me
ZX	16	H	ie	T	71			797	mu-6	Dup
						(4)	0			
				NC	TES/ADDITIO	NAL COMMEN	TS			
	jų.									

4				Well ID:	MW	-	-	Job Number:	-	7 305 00
司会	Case	adia		Client:		ter Vany	ue	Date:	2/2	5
400	Associat	aulu		Project:	GWI		0	Sampler:	100	ANTEN
	Associal	es, LLC		Weather:	(10	nidy		Time In/Out:	850	
	Y	5			WELL	. DATA				
Manusant T	(Flush-mount	/Stick-up		Well Diamet	er:	2°	Depth to Free	Product:	-
Monument T	ype:	Other:	Λ		Well Depth:			Free Product		
Monument C	ondition:	400			Depth to Wa	tor:	16.260	Water Column		
Well Cap Lock							16.00	-		
	resent:	Yes No			Screened Int	erval:	-	Purge Volume	:	
Comments:	- /\A/=+==11=	: -L-+\ \/ /\ A	1: 14/116 :		T					13
			olier) X (# Casi		2: 1 046		T			
Water height	multipliers (g	aı):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 li	iters .
Purge Metho	4.		20		_	IG DATA	T	-4/15		
Sampling Met			PP		Pump Intake		ļ	MS		
Jamping We	.nou.	Cumulative	10	T	Tubing Mate	rial & Type:	L	DIE	NEW	/ DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
857			16.24	2	6.59	10.32	664	44.10	-39.1	clecar
900				1	121	11.53	456	11 05	~35.8	Cler
			16.25		(2-7)			10.05		
903			16.26		6.65	12.17	402	4.62	-32.9	- 1 m
906			1		6.60	12.92	367	2.55	-23.2	
909					6.59	13.01	352		40	
24			1		-			2.40	-22.8	
912		No.		•	6.57	13.04	349	2.31	-19.7	V
				1						
									\	
7										74 E-100
				L	PURGIN	G DATA				
ample ID:		MIL	1-1	Sampling Flor		1		Analytical Lab	oratory:	Ano V
ample Time:		91	2	Final Depth to		16.2		Did Well Dewa		100
lo. of Contain	ers/Type	Prese	rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	1100
ZX	11	116	0		11		I III OIL	I I I I I I I I I I I I I I I I I I I	Duplicate 15	
	10	71		1 1	167					
3×	46	H		VC						
		()			7.					_
	1			-						1
							140			
				×						
				NO	TES/ADDITIO	NAL COMMENT	TS .	1		

4				Well ID:	MW~	11		Job Number:		
为金	Caso	adia		Client:	Nus	tor Voin	w	Date:	2/25	137
4	Associate	as IIC		Project:	GWM	1020	Ref.	Sampler:	190	
Continue of the last	Associate	35, LLC		Weather:	6	nols		Time In/Out:	940	-1039
		1	1		WELL	DATA				
	(Flush-mount,	/Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	297
Monument Ty	ype:	Other:			Well Depth:			Free Product	Thickness:	
Monument Co	ondition:	gwod			Depth to Wa	tor:	11. 28	Water Column		
		1 12					16.28			
Well Cap Lock	(Present:	Yes No			Screened Into	erval:		Purge Volume		-
Comments:										
			olier) X (# Casir							
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
		()/	2		PURGIN			,		100
Purge Metho		1	/		Pump Intake		10	5	6	
Sampling Met	thod:	0			Tubing Mate	rial & Type:	LD	PE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
950			16.28	2	(0.35	1180	285	2 8 Call	36.9	2 0 1
170				1	1 10	11.00	レン	1000		elecer
955			16,19		6.42	12.57	270	12.51	30.8	
956			1		6 39	12.81	261	4.49	30.0	
0,00					6	12.0	267	2 22	21.6	
921					6.52	10.60	164	1. 15	27.1	
1007			N. E.	1	4.55	13.49	265	2.46	24.9	
1005			1		6.56	13.52	264	2.64	25.6	1
1003			10.00		0.00	10. 30	4	2.01	00.0	
			142.7							
										0.35
							<u> </u>			200
										100
£										
			ļ		ļ	ļ			ļ	·
16					PLIRGIN	IG DATA				
Sample ID:		Mia	111	Sampling Flo		. 1	7.	Analytical Lab	oraton:	Apex
Sample Time:			50	Final Depth t			.16	Did Well Dew		Ten
No. of Contain				Analysis/Met	The second secon	Field Filtered		MS/MSD	Duplicate ID	No
vo. or Contail	ners/ rype	Prese	rvative	Analysis/iviet	inou	rieid riitered	Tritter Size	INIO/ INION	Toublicate ID	
LX	10	17	U.	T	M					
30	440	M	CIC	1	101					-
	- 1-	19							1	
							-			
			-							
		<u> </u>						1		
				NO	JIES/ADDITIO	NAL COMMEN	15			
								3		
								·		

4				Well ID:	MW-	5		Job Number:	1	
两金	Casc	nihn		Client:	Nu:	Steer Van	nea	Date:	2/25	
400	Associate	adia		Project:	GUST	4 192	0	Sampler:	40	
The state of	ASSOCIUI	es, LLC		Weather:	P+	Sun		Time In/Out:	1100 -	1145
		X			WELL	. DATA				
		Flush-mount	/Stick-up		Well Diamet	er:	72	Depth to Free	Product:	
Monument Ty	/pe:	Other.	Α.		Well Depth:			Free Product	Thickness:	
Nonument Co	andition:	GOOE	0		Depth to Wa	tor	28.68	Water Column		
		11/1	,				10.00	-		1000
Vell Cap Lock	Present:	Yes No			Screened Int	erval:		Purge Volume		- 3.7
omments:										1 1000
			plier) X (# Casi			1				129
Vater height	multipliers (g	al):	1-inch well =	= 0.041	2-inch = 0.16		4-inch = 0.65	3 '	1 gal = 3.785 lit	iers .
A 4 - 11			0.0		The second second second	IG DATA		- 4	2	
urge Method			B1)		Pump Intake			M		
ampling Met	hod:		17	т	Tubing Mate	rial & Type:	6	BPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1106			28.68	2	6.63	13.08	259	36:44	35.2	clar
109			1		1, 41	12 -10	21010	12.76	36.2	1
110					4.11	13.39	196			
111/					6-90	14.21	220	3.07	38.7	4 16
1115					6.87	14.29	215	2.96	39,0	
1118			V		6.87	14.32	213	2.90	40.3	
			3							X
				9				- 4		
			1	1 30						
			1					74.		
				1 1 2 2	-				- 32.1	
					-			JA'.		
								100		
								-		f 1,100 - 18
				1	PLIRGIN	NG DATA	1			
mple ID:		MA1.	3-3	Sampling Flo	- 10 mm	. 2	4	Analytical Lab	oratory:	ACIX
mple Time:			B	Final Depth 1			.77	Did Well Dew		JAL
o. of Contain			ervative	Analysis/Me		Field Filtered		MS/MSD	Duplicate ID	, -0
24	11	1 11	100				1	1	S S S S S S S S S S S S S S S S S S S	
24	11/2	1	CO	1	PH	-	+			
SX	40	1	rul	L V	00					
			34.			4 1				2
			1.97						+	
		-		-			-			182
						1927				
				N/	OTES/ADDITIC	NAL COMMEN	ITS			
		************		147		LE COMMITTEL				
					7 .					
						,				

4				Well ID:	MI	U-1		Job Number:	1	2000
为金	Caso	adia		Client:	1 4 -		cinvex	Date:	2/2	5
1	Associate	es. LLC		Project:	Gh	M 10	20	Sampler:	AL	\supset
The state of the s			_	Weather:		Sun		Time In/Out:	1205-	17.55
			-		WELL					- 16/5
Monument T	vpe: (Flush-mount/	Stigk-up		Well Diamete	er:	9	Depth to Free	Product:	
		Other:	<u> </u>		Well Depth:			Free Product 1	Thickness:	
Monument C	ondition:		00		Depth to Wat	ter:	27.80	Water Column	Length:	
Well Cap Loci	Resent:	Yes No	A STATE OF THE STA		Screened Inte	erval:		Purge Volume	:	- 174
Comments:	,									
Purge Volume	e = (Water He	ight) X (Multip	lier) X (# Casir	ng Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters .
					PURGIN	G DATA		- 10		18785
Purge Metho		(8,		Pump Intake	Depth:		MI		
Sampling Me	thod:		26		Tubing Mater	rial & Type:	4	SPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	· Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1212			27.80	.2	6.22	16.79	211	29.10	90.8	cher
1215			1	0	6.39	14 5B	142	8.08	91.1	1
1212					100	11 = 6	127			
1010					6.00	17.78	137	5.04	11,3	
1261		ple .			6.90	14.63	134	4.35	88.9	
1224					6.93	14.103	133	4.25	87.9	
1227			1		1 1 1	11) 1.1	134	1/21	86.1	
1001					6.94	19.49	1.09	7.6	OQ.I	
								0.		
								11.14		
				l	PURGIN	G DATA				
Sample ID:		ML	1-1	Sampling Flo		GUATA		Analytical Lab	oraton:	Anox
Sample Time:		17	77	Final Depth t			80	Did Well Dew		THE
No. of Contai		Prese	rvative	Analysis/Met		Field Filtered	~ ~	MS/MSD	Duplicate ID	190
Zx	11	117	0	1 7	PH	- Interest	1	1, 11100	I I	
LX	16	140		-11						
5×	40	1-1-1	<u>u</u>	VC)(_				
							-	-		1
				NC	TES/ADDITIO	NAL COMMEN	TS			

4-				Well ID:	Mr			Job Number:	T	
48	Casc	adia		Client:		itar Va		Date:	2/2	7
900	Associate	s. LLC		Project:	GWM			Sampler:	12	1.16
The state of the s	. 103001010	-		Weather:	1 3	Pt. Su	^	Time In/Out:	13/0 -	1405
	8				WELL	DATA				
Monument Typ	ne.	Flush-mount/	stick-up		Well Diamete	er:	2"	Depth to Free	Product:	
ionument ry	pc.	Other.			Well Depth:			Free Product 1	Thickness:	_
onument Co	ndition:	crach	ウ		Depth to Wa	ter:	2915	Water Column	Length:	_
Vell Cap Lock	Present:	Yes No			Screened Inte		- 191	Purge Volume		
omments:						W-10				- 10
urge Volume	= (Water Hei	ght) X (Multip	lier) X (# Casir	g Volumes)						
/ater height n			1-inch well =		2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters .
						G DATA				
urge Method	:	0	l 1		Pump Intake	Depth:	N	5		
ampling Meth	nod:	1	26		Tubing Mate	rial & Type:	LOF	E	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
13211			29.65	.2	6.04	14.82	156	11.24	104.3	elein
301			29.49		1 10	14.13	127	8 25		
100		1 1	01.41		6.16	100	100	1 - 1	107.5	
132+			<u> </u>		6.24	13.96	183	4.04	100,9	
1330					6.35	13.80	186	4.21	104.2	
1333				1	6.46	13.76	186	2.99	1039	1
336					6.50	13.72	188	2.84	103.6	8
			1			1	1			
1339			4	4	6.51	13,71	188	2.79	102-7	V
-	^									
				20.007						
							-			
The second										
										7
					 			-		
					DIDGIN	IG DATA				
ample ID:		Mu	1-4	Sampling Flo		. 2		Analytical Lab	oratory:	1 1 200
ample Time:	-	133		Final Depth t			69	Did Well Dew		Apra
o. of Contain	ers/Type		rvative	Analysis/Met			Filter Size	MS/MSD	Duplicate ID	. 20
_	11	11	r 0		0(1	c.a i incred		1	- Suprior to 10	
2x	16	H.		1	rm					
3x	40	H	U	V	UC					
								× .		
										J
						1			+	
								1	1	
				NC	OTES/ADDITIO	NAL COMMEN	TS			
				NC	DTES/ADDITIO	NAL COMMEN	TS			
				NC	DTES/ADDITIO	NAL COMMEN	TS			

Project: Vanner GWM Client: Nu Star Sampler: JW

Date: 6 / I Permit:

r	(.		,			
	Well ID:	Time:	DTP:	DTW:	Product Thickness:	Notes:
, [MW-44	736	3	26.46		
	MW-2	744		24.51		
	MW-3	749		25,73		
	MW-10	802	· ·	14.63		
	MW-6	808		13.45		
1	MW-1	817		12.97	0	
	MW-11	827	_ :	13.95		1,
	MW-9	839		15.53	, •	
- 1	MW-50	1 - 4	•	12.63		
	-	846		13.21		
	MW-8	853	X.	13.82		
1	MW-32	859		13.80	í	
	MW-7	914	,	8.00	٠	, /
	•			, ,		· · · · · · · · · · · · · · · · · · ·
			1			
9	1.		5			
			- 30-	,		
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Late			1, 1	•		•
0	•	3			1	
	,	,	1. 1	10	,	
	1 0		7.		/	
	19		_			
	- //		•		1	• • • • • • • • • • • • • • • • • • • •
	•				1	1/2

Cascadia				Well ID:	Mu	0-7		Job Number:		
为全	Caso	adia		Client:	Nus	For Va	nnex	Date:	6	
200	Associate	es IIC		Project:	Gust	4 202	0	Sampler:	Aa)
	7133001010	3, LLC		Weather:	Sur	160°		Time In/Out:	905	
					WELL	DATA				
lonument Ty	ma:	Flush-mount/	Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	·
ondinent ty	rpe.	Other:	\wedge		Well Depth:		-	Free Product	Thickness:	
onument Co	ondition:	Ago C			Depth to Wat	ter:	3 60	Water Columi	n Length:	
ell Cap Lock	Present:	Yes No			Screened Interval:		G. VU	Purge Volume		
omments:	Tresent.	163 1710			Screened into	ervai.		I dige volune	••	
	- (Mater He	ight) X (Multip	lior\ V (# Casin	a Volumos)						
	multipliers (g		1-inch well =		2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	itars
ater neight	multipliers (g	aij.	T-IIICII WEII -	0.041	PURGIN		4-111011 - 0.03	3	1 gai - 3.763 i	iters
rge Method	1:	Ω	V)	and Merchanis	Pump Intake		W	5		
mpling Met		12	7)		Tubing Mater		154)=	NEW	/ DEDICATED
		Cumulative	0		ruomg mater	1,4,7,50.	-01			
	Volume	Volume	DTW	Purge Rate	acama 3 d	Temp	Cond	DO	ORP	Clarity/Color
Time	Purged (liters)	Purged	(btc)	(L/min)	рН	(°C)	(µS/cm)	(ppm)	(mV)	Other Remarks
	(111612)	(liters)								
				HE SHARE	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
131			7.10	2	8.00	15.57	734	1.64	62	cleur
934		p.	7.19	1	7.90	14.71	726	1.20	59	
107					7.10	17. +1			==	
13+			7.26		4.63	14.11	718	1.05	5.5	
140		S. Stanford	7.31		7.41	13.86	714	. 29	49	
013		1.8	7.39		7.37	13.82	712	,20	44	
							1			
146			7,43		7.36	13.80	712	.17	43	-
		* *		-	A	100				
					100					
							 			
						37 - 1			*	
				146						
6.										
					PURGIN	G DATA				A
imple ID:		W/2, \	-7	Sampling Flo	The second second second	1		Analytical Lab	oratory:	HOEX
mple Time:	¥ ,	94	(0	Final Depth t	William William Townson	7.4	e8	Did Well Dew		Me
o. of Contair		Presei	vative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	100
7.	1/	Ho	0		4					
04	16	()	-							
5×	40	140	1	VG						
							\\		-	A
	~	1								
				NO	OTES/ADDITIO	NAL COMMEN	TS			
				NC	DTES/ADDITIO	NAL COMMEN	TS			
				NC	DTES/ADDITIO	NAL COMMEN	TS			

			. 7	Well ID:	Nu	1-10		Job Number:	. 7	
为全	Casc	adia		Client:	Nui	tor Va	mae	Date:	le	
100	Associate	s IIC		Project:	GW	M 202	D	Sampler:	a	
Tuesday Allen	7,33001010	,3, LLC		Weather:	7.6	un		Time In/Out:	1000	1050
	-				WELL	DATA				
Monument T	yna:	Flush-mount/	/Stick-up		Well Diamete	er:	77	Depth to Free	Product:	
IVIOIIdillelli I	ype.	Other:	^		Well Depth:		_	Free Product 7	Thickness:	_
Monument C	ondition:	Bros	0		Depth to Wat	er:	14.6	Water Column	Length:	~
Well Cap Loci	k Present: /	Yes No			Screened Inte	erval:	~	Purge Volume	:	
Comments:					1	***************************************				
Purge Volume	e = (Water He	ight) X (Multip	olier) X (# Casir	ng Volumes)			llanumo-aosa kapari			
	multipliers (g		1-inch well =		2-inch = 0.16	2	4-inch = 0.65	i3	1 gal = 3.785 l	iters
			-		PURGIN	G DATA				
Purge Metho		05	eri		Pump Intake	Depth:		MS	_	
Sampling Me	thod:	6	3		Tubing Mater	ial & Type:		DPE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (μS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 .°C	+/-5%	+/-0.5 ppm	+/-20 mV	
1012			14/16/10	.2	7.29	17.44	265	10-06	20	clear
1017			14:76		2.33	14 44	216	9.30	54	1
			1		7.00	12 9 9	121	6 11	103	
1018			14.70		1,00	13.17	121	4.41	100	
1021			1		6.79	13.0	113	2,64	126	
1024					6,75	13.72	113	2.60	131	
1074			-	V	R 20	1320	110	2,52	135	1
1061			•	-	Q. 77	10-10	110	0,70	100	
			,							
								· .		
				_						
					PURGIN	G DATA		1		
Sample ID:		Mi	1-10	Sampling Flor		7	-	Analytical Lab	oratorv:	April
Sample Time		100	17	Final Depth t		id	.11	Did Well Dewa		No
No. of Contai		Prese	rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
101	1	ЦС	0	TO	14	4				
LAI	in	- 11	0	1 (1)	01					
DX	40	1								
					TEC/ADDITION	IAL COLUMN	TC			
				NC	JIES/ADDITIO	NAL COMMEN	15			
			6							
							÷			

A-				Well ID:		N-5		Job Number:	_	1
明全	Caso	adia		Client:	Nu	Hour Va	nnex	Date:	6	
1	Associate	os IIC		Project:	GWS	M 2Q	20	Sampler:	Lin	
	Associate	es, LLC	1	Weather:	5	un		Time In/Out:	1102)
THE THE	Mar Tab	N			WELL	DATA				
THE ALL		Flush-mount	Stick-up		Well Diamete	er:	フベ	Depth to Free	Product:	Spinisterio-
Monument Ty	/pe:	Other:	^		Well Depth:			Free Product Thickness:		
Monument Co	ondition:	950	()		Depth to Wat	er:	13.24	Water Column		
Well Cap Lock		Yes No			Screened Inte		10,-1	Purge Volume		
Comments:	Trescrip.	103 010			Screened Interval: Purge Volume:					
	- (Mater He	ight) Y (Multin	olier) X (# Casir	ar Volumes)	T					
Water height		market and the second second	1-inch well =		2-inch = 0.16	7	4-inch = 0.65	2	1 gal = 3.785 l	tors
water neight	multipliers (g	, a 1) .	1-inch wen =	0.041	PURGING DATA Pump Intake Depth:		4-IIICII - 0.033		I gai = 3.763 i	(C13
Purge Method	d:		Pexi							
Sampling Met			101		Tubing Mater		1	NOF.	NEW	/ DEDICATED
Jamping Mc		Cumulative	1		Tubing Water	ат остуре.	6	1	(INLW	7 DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1104			13.24	.1	6.80	16 07	682	2.17	-59	llear
1102			13.30		4.31	15 37	685	1,40	-60	1
110 7			1	1		11.76	120			
1(10)			13.39		6,85	14.67	678	. 29	-97	
1113			13.57		6.87	14,20	673	.19	-105	
1116			13.72	N	6.89	14 ilo	672	16	-103	V
1114			10.10		9101	11/11/4		-/ -	10	-
		4	<i>d</i> ,		92					
				7,					1	
										<u> </u>
			7							
		-								7 100
										303
			v		PURGIN	G DATA				1
Sample ID:		Mu	1-5	Sampling Flo	THE RESERVE AND PERSONS ASSESSMENT AND PARTY.	1		Analytical Lab	oratory:	Knex
Sample Time:		111	10	Final Depth t		14	49	Did Well Dew		Nh
No. of Contain		Prese	rvative	Analysis/Met			Filter Size	MS/MSD	Duplicate ID	100
-	17	, , ,	10		DIL	, i incorcu	1	1	13-1-11-01-01-11	
	14	+	20	1	rus					
3 x	40	HI	l	VE)C					
					-					
						I NAL COMMEN	TS			
							T.			

				Well ID:	Mu	- 5V		Job Number:		
两条	Casc	adia		Client: No Star				Date:	(0/	
144	Associate	adia es, LLC		Project:	Gus	M1920		Sampler:	10	
- management	Associate	55, LLC		Weather:	5	man		Time In/Out:	1130	1215
					WELL	DATA				
Monument T	1	Flush-mount/	Stick-up		Well Diamete	r:	7	Depth to Free	Product:	
Monument	ype.	Other:			Well Depth:			Free Product	Thickness:	
Monument C	ondition:	0	rad		Depth to Wat	er:	12,67	Water Column Length:		
Well Cap Lock	k Present: /	Yes No	300		Screened Inte		1014	Purge Volume:		
Comments:			<u> </u>		our de l'inte			Tango tolamo		
	e = (Water He	ight) X (Multin	lier) X (# Casir	g Volumes)						
	multipliers (g		1-inch well =		2-inch = 0.16)	4-inch = 0.65	3	1 gal = 3.785 l	iters
Water Height	Triality for the	u1).	I men wen	0.011	PURGIN		14 IIICII 0.03		1 841 3.703 1	1013
Purge Metho	d:	P	evi		Pump Intake			MS		
Sampling Me		0	0/0		Tubing Mater			LOPE	NEW	Y DEDICATED
		Cumulative	V		Ü					
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1137			12.67	. 2	7.07	16.26	216	1.69	159	deer
11117				. 0				192	1 -	Cicer
1190			12,67		6.68	15.04	305		W	
1143					6.55	14.22	336	,59	57	
11410					6.52	14.20	341	.48	42	
1149				1	1 -	1412	340	1 1	36	V
1191			4	V	6.51	17.17	340	, 44	24	*
					-					-
	*	* Y 20								
									-	
	(c)			×2						
	,									
	х									
					PURGIN	G DATA				
Sample ID:		Mrs	1-50	Sampling Flo		v 1		Analytical Lab	oratory:	Moex
Sample Time:		11	19	Final Depth t			47	Did Well Dew		Ma
No. of Contain		Prese	rvative	Analysis/Met		Field Filtered		MS/MSD	Duplicate ID	140
1	IL	J	11	-	14					
UN	.(0		100		()		<u> </u>			
15x	40	H	U	\ \(\text{\(\text{\\ \etitx{\\ \etit}\\ \etitx{\\ \etitx}\\ \\ \etitx{\\ \etitx{\\ \etitx{\\ \etitx{\\ \e						-
						:=				
										
				NC	TES/ADDITIO	NAL COMMEN	TS			
					/					
										
				J. Marie						

201				Well ID:	MW	8		Job Number:		1
为全	Caso	adia		Client:	Nus		me	Date:	6	/1
1	Associate	es IIC		Project:	Gum	1 2020		Sampler:	1/2	2
- Cable Control	7133001010	33, LLC		Weather:	Su	V		Time In/Out:	1200	-1305
		0			WELL	DATA				
		Fush-mount/	/Stick-up		Well Diamete	er:	20	Depth to Free	Product:	-
Monument T	/pe:	Other:	^		Well Depth:			Free Product	hickness:	~
Monument C	ondition:	soud			Depth to Wat	ter:	13.89	Water Column	Length:	
Well Cap Lock	Present:	Yes No			Screened Interval:			Purge Volume	~	
Comments:	`									
Purge Volume	e = (Water He	ight) X (Multip	lier) X (# Casir	g Volumes)						1 - 1016
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	53	1 gal = 3.785 l	iters
					PURGIN	G DATA				
Purge Metho	d:		Devi		Pump Intake	Depth:		MG		
Sampling Met	hod:		TOB		Tubing Mater	ial & Type:		LDPE	NEW	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1227		-645,000	13.87	2	6.36	15.45	123	10.13	~ 33	Veer
1230			14.10	, 1	7.04	15.24	180	5.79	-45	
1233			14.23		739	14,95	142	4.30	1)	
1236			14.35	7	730	14,60	17.0	11/12	21.	142
1000			110		- 11		10	9.17	76	
1751			14.43	- 31	7,22	14.36	107	4,46	41	
1242			14.52	4	7.20	14.30	109	4,47	37	r .
								T		
								 		
				20						
					PURGIN	G DATA				
Sample ID:		Mu	J. B	Sampling Flo				Analytical Lab	oratory:	Anex
Sample Time:		171	17	Final Depth to		- 1 0	1-9D	Did Well Dewa		1300
No. of Contain		Preser	rvative	Analysis/Met		Field Filtered		MS/MSD	Duplicate ID	
O L	(// /	^ /)	, and your liviet	111	, icia i intereu	, 11001 3120	1.415/14150	Supilicate ID	
OX 1	16	17	<u>k</u>	, 1	()					24
5x	10	H(l	V	50					
			-							
									-	
				N/O	TES/ADDITIO	NAL COMMEN	rs	1		
				INU	, LS/AUUITIOI	AUT COIMINIEIA	13		****	
	9									

				weirib:		5-00		Job Number:		7
43	Casc	adia		Client: Nu Stan			Vannus	Date:	Ce	12
	Cust	uulu		Project: GwM 7			20	Sampler:	1	W
	Associate	es, LLC		Weather:	16			Time In/Out:	130	5-1350
		~	7	weather.	WELL	DATA		Time my Out.	100	/ /330
		I	1				1 2 4	T		
Monument T	vne.	Flush-mount	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Other:	\wedge		Well Depth:			Free Product T	hickness:	
Monument C	ondition:	2000	()		Depth to Wat	ter	13.86	Water Column	Length:	-
		V/ A1					10.00			
Well Cap Locl	Present:	Yes No			Screened Inte	erval:		Purge Volume	:	
Comments:										
Purge Volume	e = (Water He	ight) X (Multip	lier) X (# Casir	ng Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 li	iters
	10			<u> </u>	PURGIN				0	
Purge Metho	d·		Der 1	A.Winest Phys. V.	Pump Intake			MS		
Sampling Me			OR		Tubing Mater			LDPE/	NEW	DEDICATED
Jamping Me	inou.	6 1	J.	r	Tubing Mater	Tar & Type:		2009	INEVV	DEDICATED
	Volume	Cumulative				_			0.00	Clarity /Calan
Time	Purged	Volume	DTW	Purge Rate	рН	Temp	Cond	DO	ORP	Clarity/Color
	(liters)	Purged	(btc)	(L/min)		(°C)	(μS/cm)	(ppm)	(mV)	Other Remarks
		(liters)								
		EZEE			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1315			13.86	,2	4.31	15.68	113	11.69	140	cleen
1210								40.01	7	
1210			13.86		6.38	14.33	135	10,94	134	
1371	371				6 77	13.80	129	9.95	123	
1301	2011				100					
1324	324				6.95	13.60	126	9.24	123	
1397					7.00	13.57	121	9.25	123	
010				4	4		100	1 _	4	
1350				4	6.97	13.57	126	9.26	124	*
A.										
					1			-		
							-			
	* ×									
										
					PURGIN	G DATA	<u> </u>	-		1 1360
Sample ID:	***************************************	MW-	80	Sampling Flo		.2		Analytical Lab	oratory:	Lock
Sample Time:		133	30	Final Depth to			86	Did Well Dewa		1
										N'0
No. of Contain	ners/Type	Presei	rvative	Analysis/Met	nod	Field Filtered	I Filter Size	MS/MSD	Duplicate ID	
Zxi	6	1- 7-10		TP	H					
2	10	11/	7 (110	0	-				
5x	10	H	1	VO						
								h		
				NC	TES/ADDITIO	NAL COMMEN	TS			

				Well ID:	Mu	1-6		Job Number:		
36	Caso	adia		Client:	Nu	Star Vo	20	Date:	Carl	
200	Associate	es IIC		Project:	Gu	M 20	20	Sampler:	Z/c	<u> </u>
	713330141	03, 220		Weather:	5	in		Time In/Out:	1400	,~
						DATA				
Monument Ty	/pe:	Flush-mount	/Stick-up/		Well Diamete	er:	2	Depth to Free	Product:	
		Other:			Well Depth:			Free Product	Thickness:	
Monument Co	ondition:	Gos	D		Depth to Wa	ter:	13.50	Water Columi	n Length:	-
Well Cap Lock	Present:	Yes No			Screened Inte	erval:		Purge Volume	2:	
Comments:										
urge Volume	e = (Water He	eight) X (Multip	olier) X (# Casir	g Volumes)						
Vater height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16		4-inch = 0.65	3	1 gal = 3.785 l	iters
					PURGIN	IG DATA				
Purge Method		(Derv		Pump Intake			115		
Sampling Met	thod:	`	ef		Tubing Mate	rial & Type:	1	DIFE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1410			13.50	.2	6.81	17.47	730	6.79	-35	clear
1412			13.75	1	6.73	16.82	854	2.81	~57	1
1/1/					111	10			1 -	
19119			13.91		4.6 F	16.15	890	1.35	-67	
1419			14.05		644	16,11	902	1.30	-77	22 24 24
1422			14.16	*	6,64	16.07		1.24	-85	
7.5			1114		-					
		w								
			,							
37 . 37				W.		<u> </u>				
Part of the last							-			
			L		PLIRGIN	G DATA				
ample ID:		h/1-	1-6	Sampling Flo	The second secon	, 2	_	Analytical Lab	oratory:	Apek
ample Time:		114	21	Final Depth to			or	Did Well Dew		No
lo. of Contain		Prese	rvative	Analysis/Met			Filter Size	MS/MSD	Duplicate ID	. 40
7.4	11_	1. 4	00	-	24					
UX.	100	11	0.0	. 1			-			
34	10	H	l	V	DC					
-										1.50
									-	
-		-		NC	TES/ADDITIO	NAL COMMEN	TS			
					9		18			

				Well ID:	MW-			Job Number:	-	
明全	Case	adia		Client:	Nu St	ar Vary	Nex	Date:	6/2	
444	Associate	uulu		Project:		2920		Sampler:	An	
	Associati	es, LLC		Weather:	77 SL	un 50°		Time In/Out:	745	-830
		2			WELL					
	7	Flush-mount	/Stick-up		Well Diamete	er:	2	Depth to Free	Product:	
Monument T	ype:	Other:	1		Well Depth:		-	Free Product	Thickness:	
/lonument C	ondition:	9000	J		Depth to Wat	ter:	12.79	Water Columi	n Length:	
Vell Cap Locl	k Present:	Yes No			Screened Inte	erval:		Purge Volume	::	
omments:				***						
urge Volum	e = (Water He	ight) X (Multi	plier) X (# Casir	ng Volumes)						
Vater height	multipliers (g	;al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	53	1 gal = 3.785 l	iters
					PURGIN	G DATA		1		
urge Metho	d:	Q	2ri		Pump Intake	Depth:		MS		
Sampling Me	thod:	1	16	1	Tubing Mater		2	PE	NEW	/ DEDICATED
		Cumulative	TU					1		
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
			Fig. of Fig. 8		+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
752			12.79	,2	7.14	15.53	315	13.06	140	clear
755			12.75	1	7.06	15.36	319	11.31	146	1
758			12.79		676	1521	326	9.92	157	
801					612	15.18	326	9 21	160	
- 1					1 50	15.10	325	710	110	
804					6.50	15.14		t.69	163	
50 t		-			6,5+	15.13	324	1.61	164	
810			4	1	6.56	15.13	324	7.39	164	Y
									`	
			-					_		
					PURGIN	G DATA				
ample ID:		NA 1		Sampling Flo		,2		Analytical Lab	oraton:	Dex
iample Time		MW.		Final Depth t		16		Did Well Dew		Files
lo. of Contai		810	ervative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
O. OI COIILAI	/	Fiese	r ()	Alialysis/ivie	1/_	l leid i litered	Titler Size	1013/10130	Duplicate 1D	
LX	16	H		77	H C					
3×4	(0	H	<u>u</u>	VO						
									NI STORES	
				NO	OTES/ADDITIO	NAL COMMEN	ITS	1		
						1000-100-100-100-100-100-100-100-100-10				

. 4				Well ID:	M	WhI		Job Number:	17	
为金	Caso	adia		Client:	Nu	Star Vac	neo	Date:	6/2	
1	Associate	e IIC		Project:	Gwh	1202		Sampler:	110	كا ا
	7133001010	33, 220		Weather:	. 5	un		Time In/Out:	830 -	920
				and the second	WELL					
Monument T	ype:	Flush-mount/	Stick-up		Well Diamete	er:	7	Depth to Free		
		Other:	Λ		Well Depth:		-	Free Product	Thickness:	
Monument C	Condition:	9000	<u> </u>		Depth to Wat	ter:	13.82	Water Column	Length:	
Well Cap Loc	k Present:	Yes No			Screened Inte	erval:	- 0	Purge Volume	:	
Comments:										
Purge Volum	e = (Water He	ight) X (Multip	lier) X (# Casin	g Volumes)						
Water height	t multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters
			•		PURGIN	11/2				
Purge Metho		P	eri		Pump Intake			MID		
Sampling Me	thod:		lh		Tubing Mate	rial & Type:	1	PE	NEW	DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
1911					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
836			13.22	12	6.54	14.50	343	12.45	135	clear
220			13.82		1.10-		383	10.56	3	1
027			1		6.40	15.93				
842			1384		6.84	15.64	393	8.37	-43	
845			13.85		6.98	15.54	394	7.34	-104	
BUR			13.85	-	7 00	15.56	394	6.36	-108	
0.1					7.00			1	111	
051			13.87		7.00	15.58	394	6.10	-111	
854			13.89	*	7,0	15.59	394	6,04	-112	V
`								`		
										7 9 189
						<u> </u>				
										342
										438
					Bi in a	CDATA				
Sample ID:		I M/IA	-11	Sampling Flo	The state of the s	G DATA		Analytical Lab	orator	1 1 2 2 2
Sample Time		MW 85	- 11	Final Depth t			08	Did Well Dew		Agex
No. of Conta				Analysis/Met			Filter Size	MS/MSD	Duplicate ID	NO
	I /	riesei	1 0	- Inaiysis/iviet	77:1	ricia riiterea	I litter Size	טכועו (כועו	Dublicate ID	
-Cx	14	1	110		YT					
3x	2/0	L -	tU	NO	C					
70	11	1 4	0		PD				MW-11	Devia
- CX	110	1	70		-/					
SX	40	H		\vee	06				mw-n	hip
									y	
	N				OTES/ADDITIO	NAL COMMEN	TS			
								7.		-
L										

4				Well ID:	MW-3			Job Number:		1
为全	Casc	adia		Client:	Nu	Star Vo M Zaz	mex	Date:	4/	2
1	Associate	e IIC		Project:	GW	M 202	0	Sampler:	14	1w
many with	7133001010	3, LLC		Weather:		11.1		Time In/Out:	930	- 1015
		2			WELL	DATA				
Monument T	vne.	Flush-mount/	/Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	
IVIOIIdilicit	урс.	Other:			Well Depth:		-	Free Product 7	Thickness:	Description
Monument C	ondition:	CARG	9		Depth to Wat	er:	25.55	Water Column	Length:	
Well Cap Lock	Present: /	Ves No	<u> </u>		Screened Inte		-	Purge Volume		
Comments:	/	110			Joi Celled III.			Targe volune		
	e = (Water Hei	ight) X (Multin	olier) X (# Casin	g Volumes)	I					
	multipliers (g		1-inch well =		2-inch = 0.16	2-inch = 0.162 4		3	1 gal = 3.785 l	iters
Water Height	marcipiicis (8	21/.	I men wen	0.011	PURGIN	The second secon	4-inch = 0.653		1 gui - 5.705 i	iters
Purge Metho	d:		Onvi		Pump Intake			M5		
Sampling Me			151		Tubing Mater		/7	OPE /	NEW	DEDICATED
	\ /= l	Cumulative			-					
Time	Volume Purged	Volume	DTW	Purge Rate	pН	Temp	Cond	DO	ORP	Clarity/Color
Time	(liters)	Purged	(btc)	(L/min)	Pii	(°C)	(µS/cm)	(ppm)	(mV)	Other Remarks
	(liters)									
0.01					+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
936			25.53	,2	7.03	17.41	320	10.72	-113	deco
935			25,55		7.00	1673	270	9.49	-102	(
941			1		6.85	16.35	243	8,37	-70	
945							_ 1 .			
9-15					6.82	16.20	246	7.16	-59	es a la
949				1	6.82	16.15	244	7.01	-49	4
951			•	4	6.82	16.12	744	6.96	-43	-
						14,1-		u, j u		
					<u> </u>					
	122-10-		,							
										Y = 3
					PURGIN	G DATA				
Sample ID:		MW	-3	Sampling Flo	w Rate:	.1	_	Analytical Lab	oratory:	Lex
Sample Time:		90	5	Final Depth to	o Water:	25	5,59	Did Well Dewa	ater:	No
No. of Contai	ners/Type	Prese	rvative	Analysis/Met	hod ,	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
2 x	IL	1 L	12	7	DH					
3.	110		760	1/	OC					
UX	40	-	100							
										7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
				N/C	TES/ADDITIO	NAL COMMEN	I			
						AUT COMMINITIA	13			
								Table 1		
							J. 1		A	1
							17			

				Well ID:	MW-	. 4		Job Number:	1 -	
1) 2	Caso	adia		Client:	Nus	Hay Va	Mex	Date:	6/2	7
200	Associate	es. LLC		Project:	GWI	N 202	0	Sampler:	Au	
	7.0000.01	00, 220		Weather:		un 65		Time In/Out:	1026	-1105
)		WELL					
Monument T	ype:	Elush-mount	/Stick-up		Well Diamete	er:	2	Depth to Free		-
		Other:	0		Well Depth:			Free Product	Thickness:	_
Monument C	ondition:	NO CO	Y		Depth to Wa	ter:	26.19	Water Column	Length:	
Well Cap Loc	k Present:	Yes No			Screened Inte	erval:		Purge Volume	:	
Comments:										
Purge Volum	e = (Water He	ight) X (Multip	olier) X (# Casir	ng Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785 l	iters
		_	(PURGIN					
Purge Metho		(F	rery		Pump Intake			Mg	1	
Sampling Me	thod:		lh.		Tubing Mate	rial & Type:	L	OPE/	NEW	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
				MANAGES ST	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1026			26,19	2	6.65	18.33	269	11.70	2	cleer
1029			~ 4/1		1 .1.	16.37	291	1	27	
					1			9.74		
1032					4.40	16,13	295	7.97	34	
1035					6.37	16.10	291	7.29	42	
1038					6.37	16.09	291	7.11	45	
11			1	W.	4.36	16.04	792	6.90	,//	4 30
1041	0				4.00	14,09	610	4.10	96	Y
										144 12
* * **										
										- 1 A
7										34
		L			PURGIN	G DATA		L		
Sample ID:		MU	1-4	Sampling Flo		.2	_	Analytical Lab	oratory.	Agek
Sample Time:		104		Final Depth to		76	.70	Did Well Dewa		No
No. of Contain			rvative	Analysis/Met		00	Filter Size	MS/MSD	Duplicate ID	
10	11	1. 1/	0		DA					
2 ×	116		11	N/-		17 - 121				
5×	90	H	CL	, Ac						
		3								
										v 3
										7/2
		-						-	-	
					1111 001 11 151					
	N			NC	DIES/ADDITIO	NAL COMMEN	IS			

4				Well ID:	M	N-2		Job Number:		1
为全	Caso	adia		Client:	Ni	Stor V	onnex	Date:	Ce	12
440	Associate	aulu		Project:	GIN	W707		Sampler:	1	2
	Associate	55, LLC		Weather:	50	un 70	P	Time In/Out:	1320	-1410
					WELL	DATA				
Monument T	(100)	Flush-mount	Stick-up		Well Diamete	er:	2	Depth to Free	Product:	
violiument i	ype.	Other:	^		Well Depth:			Free Product 1	hickness:	
Monument Co	ondition:	CA	200		Depth to Wat	ter:	24,46	Water Column	Length:	
Well Cap Lock	Present:	Yes No	30 (V		Screened Inte		- 11014	Purge Volume		
Comments:	Trescite.	103			1 Screened inte	ci vai.		ruige volume		
	- (\A/ator Ho	iab+\ V / \ A I+in	olier) X (# Casir	- 1/alumaa)						
			1-inch well =		2-inch = 0.16	1	14 inch = 0.05	2	1 ==1 = 2 705	itana
vater neight	multipliers (g	ai):	1-inch well =	0.041	PURGIN	Annual Control of the	4-inch = 0.65	3	1 gal = 3.785 l	iters
urge Metho	4.	.0	e les		Pump Intake			115		
ampling Met		¥	0/		Tubing Mater			LOPE	NEW	/ PEDICATED
amping we	.nou.	Cumulative	M	I	Tubing Mater	lai & Type:		COTE	INEVV	7 DEDICATED
Time	Volume Purged (liters)	Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
				1212232	+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	THE ALTERNATION OF
320			24,46	.2	1 00	1	132	939	132	eleen
201				1	6.38	18.26		0 70		eleen
331			24.50	9	6.47	17.50	304	8.70	130	1
1334			24.51		6.54	16.34	307	7.64	124	
1227			011.53		651	11. 07	799		121	
1204			24:53		6,56	16.0	1			A
340	W.,		24.54	0	6.56	15.94	294	6.69	123	
1343			24.57	+ +	6.56	1591	743	4.51	171	
						7.7.1			(- (
All Action										
		Alman at								
					1.00					
179-									2	1
									Page 1	
										7
		· · · · · · · · · · · · · · · · · · ·								
			<u> </u>							
							T (
			100		PURGIN					1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
ample ID:		100	Wit	Sampling Flo		,72		Analytical Lab		Apex
ample Time:		15	49	Final Depth t			.70	Did Well Dewa		ND
o. of Contain	ners/Type	Prese	rvative	Analysis/Met		Field Filtered	Filter Size	MS/MSD	Duplicate ID	
2	14	1-	tce	T	pa					
200	40	13	200	(10 C					
	10	10								- 1
						Tau y				
										113
						· · · · · · · · · · · · · · · · · · ·				
							110			2.32.30
				NC	TES/ADDITIO	NAL COMMEN	TS			
_					4 1		3 4		10	
										A 24 May
									900	

				Well ID:	Mu	1-9		Job Number:		/
为金	Caso	adia		Client:	Nu ?	Jar Va	nnex	Date:	6	12,
1	Associate	adia es, LLC		Project:	Gus	m rar	O	Sampler:	1	fc
A STATE OF THE PARTY OF THE PAR	7 1550 CTUTE	3,110		Weather:		Sur		Time In/Out:	1415	
					WELL		I (/)			
Monument T	ype:	Flush-mount/	Stick-up		Well Diamete	er:	2"	Depth to Free	Product:	
		Other:	Λ		Well Depth:	~		Free Product 1	hickness:	
Monument C	ondition:	cyc	bor V		Depth to Wa	ter:	15 42 Water Column Length:			
Well Cap Loc	Present:	Yes No			Screened Inte	erval:		Purge Volume	:	1 18
Comments:										
Purge Volum	e = (Water He	ight) X (Multip	lier) X (# Casir	ng Volumes)						
Water height	multipliers (g	al):	1-inch well =	0.041	2-inch = 0.16	2	4-inch = 0.65	3	1 gal = 3.785	liters
					PURGIN	G DATA				
Purge Metho			pers		Pump Intake			MS		
Sampling Me	thod:		· Up		Tubing Mater	rial & Type:	1	DPE	NEW	/ DEDICATED
Time	Volume Purged (liters)	Cumulative Volume Purged (liters)	DTW (btc)	Purge Rate (L/min)	рН	Temp (°C)	Cond (µS/cm)	DO (ppm)	ORP (mV)	Clarity/Color Other Remarks
		1.70.1005			+/-0.1	+/-0.5 °C	+/-5%	+/-0.5 ppm	+/-20 mV	
1423			15.44	. 2	6.62	19.39	192	8,74	117	cleer
1426			15.50	1	6.61	15.81	135	212	126	1
1111 0					1 -	115 60	122	1.1	120	
1767			15.54		6.50	19.70	0	6.51	100	
1432			15.57		6,49	14.80	124	6,49	14+	
1435			15.62	V	6.42	14.75	121	6.44	152	V
1438								10/4		. 419
1100										
							200			
		4	,							30
374									(4)	
									4	
							1		B. Leger	
					PURGIN	G DATA				
Sample ID:	MW-9	Mh	7-9	Sampling Flo		,1	_	Analytical Lab	oratory:	Apox
Sample Time		140	35	Final Depth to	o Water:	15	,88	Did Well Dewa	ater:	Wx x
No. of Contai	ners/Type	Presei	rvative	Analysis/Met	hod	Field Filtered	Filter Size	MS/MSD	Duplicate ID	
7,	< 11	4	()	1	714	-				
2	, 1m	14	0	1,16	20					
	X	M	~			T- T-				
					9					in a
				NO	TES/ADDITIO	I NAL COMMEN	TS .			
		v		.10	0,1.0011101	Z GOITHITEIT	-		-	
							11			
			1							
				STOLE IS MICOL						

APPENDIX D

HISTORICAL GROUNDWATER ANALYTICAL DATA

Appendix D Summary of Analytical Results - Monitoring Wells NuStar Terminals Operations Partnership, L.P. – Annex Terminal Vancouver, Washington

	T			1					1	
Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	05/14/02	<0.080	0.455 ^{5.}	<0.500	<0.0005	<0.0005	<0.0005	<0.001		
	05/19/03				<0.001	<0.001	<0.001	<0.002		
	05/25/07	<0.080	<0.238	<0.476	<0.0002	<0.0005	<0.0005	<0.001		
	08/24/07	<0.1	<0.238	< 0.476	<0.001	<0.002	<0.002	<0.006		
	11/26/07	<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006		
	02/27/08	<0.080	<0.294	<0.588	<0.0005	<0.0005	<0.0005	<0.001		
	03/31/10	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015		
	09/01/10	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015		
	12/16/14	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005		
	03/25/15	<0.250	<0.046	<0.093	<0.0005	<0.0005	<0.0005	< 0.001		
MW-1	06/24/15	<0.250	<0.100	<0.250	<0.0005	<0.0005	<0.0005	< 0.001		
	09/15/15	<0.250	<0.130	< 0.340	<0.0005	<0.0005	0.0015	0.0022		
	02/19/19	<0.100	<0.0762	<0.152	<0.0002	<0.001	<0.0005	<0.00015	<0.001	
	05/20/19	<0.05	< 0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/29/19	<0.05	< 0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
	11/19/19	<0.100	<0.0755	<0.151	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	2/25/2020	<0.100	0.201 ^A	<0.154	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	< 0.002
	6/2/2020	<0.100	0.212 ^A	<0.151	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	< 0.002
	8/19/2020	<0.100	<0.189	< 0.377	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	< 0.002
	11/17/2020	<0.100	0.0998 ^A	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	05/14/02	41.4	<0.250	<0.500	4.35	2.68	1.84	8.72		
	05/19/03				0.534	0.00975	0.194	0.876		
	05/25/07	0.439	<0.238	<0.476	0.071	0.00114	0.0361	0.0453		
	08/24/07	0.102	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006		
	11/26/07	<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006		
	02/27/08	0.0817	<0.294	<0.588	0.005	<0.002	<0.002	<0.001		
	03/31/10	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.001		
	09/01/10	<0.250	<0.250	<0.500	0.0016	<0.0005	<0.0005	<0.0015		
	12/16/14	<0.250	<0.250	<0.500	<0.0015	<0.0005	<0.0005	<0.0015		
	03/25/15	<0.250	<0.236	<0.091	<0.0005	<0.0005	<0.0005	<0.0003		
MW-2	06/24/15	<0.250	<0.100	<0.250	<0.0005	<0.0005	<0.0005	<0.001		
	09/15/15	<0.250	0.100	0.230	<0.0005	<0.0005	<0.0005			
	02/19/19	<0.100	<0.17 <0.0755		<0.0003	<0.0003		<0.001	0.00121	
				<0.151			<0.0005	<0.00015		
	05/20/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	0.0031	 -0.002
	08/29/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	0.00069	<0.00075	0.00125	<0.002
	11/19/19	<0.100	<0.0762	<0.152	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	2/25/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	0.00774	<0.002
	8/18/2020	<0.100	<0.189	<0.377	<0.0002	<0.001	<0.0005	<0.0015	0.00521	<0.002
	11/17/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	0.00243	<0.004
	05/14/02	4.5	<0.250	<0.500	0.0419	0.0096	0.293	0.521		
	05/19/03				0.0908	0.0097	0.338	0.5382		
	05/25/07	0.361	<0.238	<0.476	<0.0005	<0.0005	0.0132	0.0145		
	08/24/07	<0.1	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006		
MW-3	11/26/07	<0.080	<0.236	<0.472	0.0011	<0.002	0.0066	<0.006		
C-AAIAI	02/27/08	2.14	0.387 ^{6.}	<0.500	<0.0005	<0.0005	0.17	0.17		
	2/27/2008 DUP	1.85	0.342	<0.485	0.0011	<0.0005	0.19	0.2		
	03/31/10	2.10	<0.250	< 0.500	<0.0005	<0.0005	0.018	0.021		
	03/31/10	0	10.230	.0.500						
	3/31/2010 DUP	1.90	<0.250	<0.500	<0.0015	<0.0015	0.018	0.020		



Appendix D
Summary of Analytical Results - Monitoring Wells
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	9/1/2010 DUP	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015		
	12/16/14	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005		
	03/25/15	< 0.418	<0.046	<0.092	<0.0005	<0.0005	<0.0005	<0.001		
	06/24/15	<0.250	0.120	<0.026	<0.0005	<0.0005	<0.0005	<0.001		
	09/15/15	<0.250	0.140	<0.250	<0.0008	<0.0008	<0.0008	<0.001		
	02/18/19	<0.100	<0.0755	<0.151	<0.0002	< 0.001	<0.0005	<0.00015	<0.001	
MW-3	05/20/19 08/29/19	<0.05	<0.0377 	<0.0755 	<0.0001	<0.0005	<0.00025	<0.00075 	<0.0005 	
	11/19/19	0.114	<0.0769	<0.154	<0.0002	< 0.001	0.00661	0.0113	<0.001	<0.002
	2/25/2020	<0.100	0.0955 ^A	<0.154	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	<0.0762	<0.152	<0.0002	< 0.001	<0.0005	<0.0015	< 0.001	<0.002
	8/18/2020	<0.100	<0.189	<0.377	<0.0002	< 0.001	<0.0005	<0.0015	< 0.001	<0.002
	11/17/2020	<0.100	<0.0748	<0.15	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.004
	05/14/02	<0.080	0.358	<0.500	<0.0005	<0.0005	<0.0005	<0.001		
	05/19/03				<0.001	<0.001	<0.001	<0.002		
	05/25/07	<0.080	<0.238	<0.476	<0.0002	<0.0005	<0.0005	<0.001		
	08/24/07	<0.1	<0.238	<0.476	<0.001	<0.002	<0.002	<0.006		
	11/26/07	<0.080	<0.236	<0.472	<0.001	<0.002	<0.002	<0.006		
	02/27/08	<0.080	<0.248	<0.495	<0.0005	<0.0005	<0.0005	<0.001		
	03/31/10	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015		
	09/01/10	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0015		
	12/16/14	<0.250	<0.250	<0.500	<0.0005	<0.0005	<0.0005	<0.0005		
	03/25/15	<0.250	0.074	<0.091	<0.0005	<0.0005	<0.0005	<0.001		
MW-4	06/24/15	<0.250	<0.099	<0.250	<0.0005	<0.0005	<0.0005	<0.001		
	09/15/15	<0.250	<0.130	<0.340	<0.0005	<0.0005	<0.0005	<0.001		
	02/18/19	<0.100	<0.0755	<0.151	<0.0002	< 0.001	<0.0005	<0.00150	<0.001	
	05/20/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/29/19									
	11/19/19	<0.100	<0.0784	<0.157	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	2/25/2020	<0.100	<0.0769	<0.154	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	0.0914	<0.152	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	8/18/2020	<0.100	<0.189	<0.377	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	11/17/2020	<0.100	0.0783 ^A	<0.151	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.004
	12/16/14	15	0.350	<0.500	0.00070	0.00066	0.12	1.2		
	12/16/2014 DUP	15	<0.250	<0.500	0.00088	0.00081	0.18	1.3		
	03/25/15	18.1	<0.045	<0.091	<0.00050	0.00061	0.218	1.45		
	3/25/2015 DUP	17.2	<0.046	<0.092	0.0005	0.00065	0.236	1.22		
	06/24/15	15	0.33 ^D	<0.250	<0.0012	<0.0012	0.228	1.51		
	6/24/2015 DUP	16.8	0.560 ^D	<0.250	<0.0012	<0.0012	0.232	1.49		
	09/15/15	17.3	0.82 ^D	<0.34	<0.00050	0.00060	0.289	1.92		
	07/11/16	19.4	0.310	<0.29	<0.00084	0.00100	0.215	1.17		
MW-5	10/23/17	7.93 ^{J-}	1.26	<0.25	<0.0010	0.00117	0.174	0.99		
	11/30/17	11.3	1.63	<0.25	<0.0250	<0.0250	0.187	1.21		
	11/30/17 DUP	10.9	1.75	<0.25	<0.0010	0.00112	0.187	1.48		
	02/28/18	9.86	1.77	<0.25	<0.0010	0.00115	0.145	0.877		
	05/29/18	13.2	2.20	<0.25	<0.0010	0.00130	0.271	1.15		
	08/30/18	18.6	0.819 ^E	<0.151	<0.00200	<0.0100	0.190	0.936		
	8/30/2018 DUP	20.8	0.631 ^E	<0.151	<0.00200	<0.0100	0.212	1.06		
	02/18/19	29.2	1.06 ^E	<0.151	<0.00200	<0.0100	0.187	1.06	<0.010	



Appendix D
Summary of Analytical Results - Monitoring Wells
NuStar Terminals Operations Partnership, L.P. – Annex Terminal
Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalend (mg/L)
	05/21/19	22	0.722	<0.0784	<0.002	<0.01	0.252	1.04	<0.010	
	08/28/19	24.8	0.963	<0.0769	<0.002	<0.01	0.239	1.1	<0.01	2.07
	8/28/2019 DUP	21.7	0.879	<0.0769	<0.002	<0.01	0.179	0.836	<0.01	1.44
	11/18/19	23.5	0.771	<0.152	<0.004	<0.02	0.257	1.19	<0.02	1.62
	11/18/2019 DUP	20.0	0.696	<0.152	<0.01	<0.05	0.284	1.46	<0.05	1.51
MW-5	2/24/2020	23.4	2.4 ^G	<0.154	<0.004	<0.02	0.176	0.809	<0.02	1.52
	6/1/2020	12.7	2.04 BF	0.193 ^c	<0.004	< 0.02	0.244	0.844	<0.02	1.29
	8/17/2020	18.8	2.17 ^E	<0.377	<0.002	<0.01	0.154	0.704	<0.01	1.4
	8/17/2020 DUP	22.6	2.1 ^E	<0.377	<0.002	<0.01	0.21	0.94	<0.01	1.74
	11/16/2020	18.5	1.92 ^E	<0.151	<0.004	<0.02	0.206	1.05	<0.02	1.42
	10/24/17	0.42	0.147 ^J	<0.25	<0.0010	<0.0010	0.00138	0.00296 J		
	11/30/17	0.41	0.49	<0.25	<0.0010	<0.0010	<0.0010	<0.0030		
	02/28/18	0.589	0.249	<0.25	<0.0010	<0.0010	0.00508	0.00204		
	05/29/18	0.68	<0.38	<0.38	<0.0010	<0.0010	0.00220	<0.0030		
	08/30/18	0.673	<0.0755	<0.151	<0.000200	<0.00100	<0.00050	<0.00150		
	02/18/19	0.165	<0.0748	<0.150	<0.000200	<0.00100	<0.00050	<0.00150	<0.001	
MW-5D	05/21/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/28/19	0.309	< 0.0374	<0.0748	<0.0001	<0.0005	0.00078	<0.00075	<0.0005	<0.002
	11/18/19	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	2/24/2020	<0.100	0.109 ^A	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/1/2020	<0.100	0.0974 ^A	<0.152	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	8/17/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	0.200	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	12/16/14	15	<0.250	<0.500	0.47	0.065	1.3	2.6		
	03/25/15	13.7	0.047	<0.092	0.516	0.0756	1.40	2.26		
	06/24/15	17.7	1.2 D	<0.250	0.423	0.0582	1.58	1.92		
	09/15/15	15.1	0.54 D	<0.34	0.306	0.0672	1.23	1.92		
	9/15/2015 DUP	14	0.44 D	<0.35	0.328	0.0684	1.32	2.07		
	07/11/16	15.5	0.23	<0.28	0.358	0.0616	1.63	1.82		
	10/24/17	7.73	5.07	0.111	0.194	0.051	1.51	1.29		
	10/24/17 DUP	4.19 ^J	8.96 ^{QJ}	1.19 ^{QJ}	0.153	0.046	1.18	1.04		
	11/30/17	9.42	7.44	0.69	2.223	0.053	1.71	1.12		
	02/28/18	7.72	3.57	0.152	0.256	0.0423	1.44	0.735		
	05/29/18	1.5	9.30	0.570	0.23	0.0444	1.38	0.891		
MW-6	08/30/18	20.1	1.24 ^E	<0.151	0.212	0.0452	1.59	1.15		
	02/18/19	18.2	2.15 ^G	<0.151	0.249	0.0408	1.74	0.577	<0.010	
	05/20/19	20	1.23	<0.0755	0.218	0.0426	1.86	0.937	<0.010	
	08/29/19	16.8	1.64	<0.0755	0.177	0.0394	1.69	0.585	<0.01	0.561
	11/19/19	6.30	1.95	<0.150	0.0712	<0.02	0.709	0.127	<0.02	0.163
	2/25/2020	15.6	4.02 ^G	<0.769	0.19	0.0308	1.74	0.420	<0.02	0.340
	2/25/2020 DUP	14.8	4.35 ^G	<0.769	0.186	0.0288	1.68	0.405	<0.02	0.329
	6/1/2020	11.3	6.92 ^{BG}	<0.15	0.163	0.0286	1.74	0.363	<0.01	0.433
	8/17/2020	14.9	2.66 ^G	<0.377	0.166	0.0345	1.79	0.370	<0.01	0.316
	11/17/2020	12.5	4.62 ^{BG}	<0.154	0.149	0.0248	1.85	0.207	<0.02	0.279
	11/17/2020 DUP	13.7	6.93 ^{BG}	<0.157	0.163	0.032	2.08	0.398	<0.02	0.315



Appendix D Summary of Analytical Results - Monitoring Wells NuStar Terminals Operations Partnership, L.P. – Annex Terminal Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	07/11/16	<0.250	<0.19	<0.29	<0.00050	<0.00050	<0.00050	<0.00015		
	02/19/19	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.00015	<0.001	
	05/20/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/28/19	<0.05	<0.0388	<0.0777	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
MW-7	11/18/19	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	8/17/2020	<0.100	<0.187	<0.374	<0.0002	< 0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	07/11/16	<0.250	<0.19	<0.29	<0.00050	<0.00050	<0.00050	<0.00015		-
	7/11/16 DUP	<0.250	<0.19	<0.29	<0.00050	<0.00050	<0.00050	<0.00015		
	02/18/19	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.00015	<0.001	
	05/21/19	<0.05	<0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
MW-8	08/28/19	<0.05	<0.0412	<0.0825	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
	11/18/19	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	8/17/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	02/18/19	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.00015	<0.001	
	05/21/19	<0.05	< 0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/28/19	<0.05	< 0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
MW-8D	11/18/19	<0.100	<0.0762	<0.152	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
IVIVV-8D	2/24/2020	<0.100	< 0.0769	<0.154	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
	6/1/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
	8/17/2020	<0.100	<0.189	<0.374	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.004
	07/11/16	<0.250	<0.19	<0.29	<0.00050	<0.00050	<0.00050	<0.00015		
	02/18/19	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	< 0.0015	<0.001	
	05/21/19	<0.05	< 0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
	08/28/19	<0.05	< 0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
MW-9	11/18/19	<0.100	<0.0762	<0.152	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	2/24/2020	<0.100	<0.0769	<0.154	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	6/2/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	8/17/2020 11/16/2020	<0.100 <0.100	<0.189 <0.0755	<0.377	<0.0002 <0.0002	<0.001	<0.0005 <0.0005	<0.0015 <0.0015	<0.001 <0.001	<0.002 <0.004
				<0.151		<0.001				<0.004
	07/11/16	<0.250	<0.19	<0.29	<0.00050	<0.00050	<0.00050	<0.00015		
	02/19/19	<0.100	<0.0748	<0.150	<0.0002	<0.001	<0.0005	<0.00015	<0.001	
	05/21/19	<0.05	<0.0377	<0.0755	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	
NAVA / 40	08/29/19	<0.05	<0.0374	<0.0748	<0.0001	<0.0005	<0.00025	<0.00075	<0.0005	<0.002
MW-10	11/19/19	<0.100	<0.0762	<0.152	<0.0002	<0.001	<0.0005 <0.0005	<0.0015 <0.0015	<0.001	<0.002
	2/24/2020 6/1/2020	<0.100 <0.100	<0.0769 <0.0755	<0.154 <0.151	<0.0002 <0.0002	<0.001 <0.001	<0.0005	<0.0015	<0.001 <0.001	<0.002 <0.002
	8/19/2020	<0.100	<0.0755	<0.151	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
	11/16/2020	<0.100	<0.187	<0.374	<0.0002	<0.001	<0.0005	<0.0015	<0.001	<0.002
										\U.UU4
MW-11	02/19/19 05/21/19	0.727 3.05	<0.0748 <0.0374	<0.150 <0.0748	0.00162 0.0643	0.00176 0.00843	0.083 0.359	0.0652 0.0355	<0.001	
	U2//1/19	< 05	<u>1/4</u>	<1111/4X	11 116/43	U UUX/13	1 11 359	ロロイケケ	< 0.0005	



Appendix D Summary of Analytical Results - Monitoring Wells NuStar Terminals Operations Partnership, L.P. – Annex Terminal Vancouver, Washington

Well Number	Sample Date	TPHg Gasoline (mg/L)	TPHd Diesel (mg/L)	TPHo Heavy Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
	11/19/19	45.0	0.239	<0.151	0.0526	0.159	4.33	7.73	<0.02	0.414
	2/25/2020	2.65	0.341 ^{AG}	<0.154	0.00397	<0.01	0.292	0.257	<0.01	0.0257
	6/2/2020	1.59	0.129 AG	<0.15	0.0232	<0.0025	0.352	0.0812	<0.0025	0.0225
MW-11	6/2/2020 DUP	1.62	<0.0755	<0.151	0.022	<0.0025	0.353	0.083	<0.0025	0.022
	8/19/2020	13.9 R	<0.187	< 0.374	0.00337	0.175 R	0.817 R	2.93 ^R	<0.001	0.0906 R
	8/19/2020 DUP	22.9 ^R	0.23 ^E	<0.377	0.00541	0.268 R	1.36 ^R	4.81 R	<0.001	0.145 ^R
	11/17/2020	23.3	0.298 AG	<0.151	0.0359	0.0705	2.18	3.31	<0.001	0.207
Washington DO A Cleanup Leve	DE MTCA Method	0.8	0.5	0.5	0.005	1	0.7	1	0.02	0.16

Notes:

- 1. TPHg = Total petroleum hydrocarbons in gasoline carbon range by NW-TPHgx method.
- 2. TPHd = Total petroleum hydrocarbons in diesel carbon range by NW-TPHdx method.
- 3. TPHho = Total petroleum hydrocarbons ion heavy oil carbon range NW-TPHdx method.
- 4. **Bold** values represent concentration that exceeds MTCA Method A cleanup level.
- 5. Analysis completed without silicagel cleanup. Lab detected hydrocarbons with non-petroleum peaks or elution pattern that suggests the presence of biogenic interference.
- 6. Hydrocarbon pattern most closely resembles a blend of heavy gas-/light diesel-range components.
- 7. mg/L (ppm) = Milligrams per liter (parts per million).
- 8. TPHg cleanup level dependent on presence of benzene in groundwater. Cleanup level = 0.800 mg/L if benzene is present and 1.00 mg/L if benzene is not present.
- 9. Washington DOE MTCA Method A cleanup level = Washington Department of Ecology Model Toxics Control Act Method A cleanup level.
- 10. < = Not detected at or above the specified laboratory method reporting limit (MRL).
- 11. bgs = below ground surface
- 12. -- = Sample not analyzed for constituent.

Quality Assurance/Quality Control Data Qualifiers

- A: Data flagged F-11 = The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
- B: Data flagged F-13 = The chromatographic pattern does not resembel the fuel standard used for quantitation.
- C: Data flagged F-16 = Results for oil are estimated due to overlap from the reported diesel result.
- D: Data flagged D = Laboratory report noted discrete peaks that are not indicative of diesel. The laboratory chemist confirmed the peaks were from non-petroleum organic material.
- E: Data flagged F-18 = Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
- F: Data flagged F-19 = Results are estimated due to the presence of multiple duel products.
- G: Data flagged F-20 = Result for Diesel is estimated due to overlap from Gasoline Range Organics or other VOCs.
- J: Data flagged J = Reported result is an estimated value.
- J-: Data flagged J- = Reported result is estimated and biased low.
- Q: Data flagged Q = Sample prepared and/or analyzed outside of recommended holding time. Result is considered biased low.
- R: Data flagged R = The relative percent difference between the sample and duplicate sample is above 30%.



APPENDIX E

DATA QUALITY REVIEW



1.0 INTRODUCTION

This attachment documents the results of a quality assurance/quality control (QA/QC) review of the analytical data for the groundwater samples collected as part of the 2020 quarterly groundwater monitoring events at the NuStar Terminals Operations Partnership (NuStar) Annex Terminal in Vancouver, Washington (the Facility). Soil and groundwater sample analyses were performed by accredited environmental laboratories; laboratories used during the investigation are listed in the table below. Copies of the laboratory reports are included in this attachment.

Report	Sampling Date	Event	Laboratory
A9B0728	2/24/20-2/25/20	Groundwater monitoring	Apex Labs -
A9DU726	2/24/20-2/25/20	event	Portland, OR.
A0F0070	6/1/20 6/2/20	Groundwater monitoring	Apex Labs -
AUFUU/U	6/1/20-6/2/20	event	Portland, OR.
A0H0521	8/17/20-8/18/20	Groundwater monitoring	Apex Labs -
A0110321	0/17/20-0/10/20	event	Portland, OR.
A0K0700	11/16/20-11/17/20	Groundwater monitoring	Apex Labs -
71010700	11/10/20-11/17/20	event	Portland, OR.

2.0 DATA VALIDATION

The QA review included examination and validation of the laboratory data packages for the following:

- Analytical preparation and quantitation methods;
- Analytical method holding times;
- Sample handling;
- Chain-of-custody protocols handling;
- Detection and reporting limits;
- Method blank detections;
- Laboratory control samples, matrix spikes and surrogates to assess laboratory accuracy;
- Laboratory control sample duplicates and matrix spike duplicates to assess laboratory precision; and
- Field duplicates to assess sampling and laboratory precision

The QA/QC review did not include a review of raw data.

2.1 DATA QUALIFIERS

Any data that are found to have possible bias or error were qualified and flagged. The flags used in the data table are below.



F-11	The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
F-13, F-18 - F-20	Various laboratory notes regarding the hydrocarbon pattern on the NWTPH-Gx and NWTPH-Dx analysis; in general, the chromatograph patterns don't exactly match the standard and/or there is an overlap in hydrocarbon ranges in the samples. Note: while the hydrocarbon overlap was noted on the report tables, the data flags were not carried through to the tables as they don't indicate a quality issue for sample results.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-17	Relative percent difference (RPD) between original and duplicate is outside control limits.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
Q-30	Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
Q-41	Estimated results. Recovery of continuing calibration verification sample above upper control limits for this analyte. Results are likely biased high.
Q-42	Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample and percent recovery or RPD was outside control limits.
R	The relative percent difference between the sample and duplicate sample is above 30%.
T-02	The Batch QC sample was analyzed outside of the method specified 12-hour tine window. Results are estimated.

3.0 ANALYTICAL METHODS

Groundwater analyses included the following:

- Gasoline-range petroleum hydrocarbons (TPHg) by Method NWTPH-Gx;
- Diesel-range petroleum hydrocarbons (TPHd) and oil-range petroleum hydrocarbons (TPHo) by Method NWTPH-Dx; and



• Benzene, toluene, ethylbenzene, and xylenes (collectively BTEX) and Naphthalene by U.S. Environmental Protection Agency (EPA) Method 8260C.

4.0 QUALITY ASSURANCE OBJECTIVES AND REVIEW

The general QA objectives for this project were to develop and implement procedures for obtaining, evaluating, and confirming the usability of data of a specified quality for soil and groundwater concentration monitoring at the Facility. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody procedures.

Reporting limits and analytical results for the samples were compared to Washington Department of Ecology MTCA Method A Cleanup Levels for each parameter. Precision, accuracy, representativeness, completeness, and comparability parameters used to indicate data quality are defined below.

4.1 HOLDING TIMES AND SAMPLE RECEIPT

The holding time is the minimum amount of time the sample can be stored before analytes start to degrade and are not representative of initial sampling concentrations. Holding times are defined by analytical methods. The groundwater samples included in this QA/QC review were analyzed within the method recommended holding time.

Method	Matrix	Analyte	Preservative	Hold Time	
EPA 8260C	Water	BTEX, MTBE and	Hydrochloric Acid (HCl) to pH<2;	14 days	
EPA 6200C	water	naphthalene	No headspace; Glass VOA	14 uays	
NIA/TDIL C	Matan	Gasoline Range	Hydrochloric Acid (HCl) to pH<2;	1.4 daysa	
NWTPH-Gx	Water	Organics	No headspace; Glass	14 days	
NWTPH-Dx	Water	Diesel Range Organics	Hydrochloric Acid (HCl) to pH<2;	14 days	
NWIFH-DX	water	Diesei Kalige Organics	Amber glass container	14 uays	

Samples were received on ice below 4°C by the analytical laboratory. Sampling containers arrived intact and unbroken to the laboratories. Groundwater samples to be analyzed for volatile organic compounds (VOCs) were received without headspace in VOA (volatile organic analysis) sampling containers. All chain-of-custody procedures were appropriately relinquished by the Cascadia Associates sampler and received by the analytical laboratory. There were no major discrepancies found between the bottles and the chain-of-custody procedures received.

4.2 REPORTING LIMITS

Reporting limits are the lowest concentration an instrument is capable of accurately detecting an analyte. They are determined by the laboratory and are based on instrumentation capabilities, the matrix of field samples, sample preparation procedures and suggested reporting limits by the EPA



or the Washington Department of Ecology. In some cases, the reporting limits may be raised due to high concentrations of analytes or matrix interferences. Detection limits were generally consistent with industry standards and regulatory standards. Reporting limits for individual samples varied based on the magnitude of the chemical impact.

4.3 METHOD BLANKS

A method—or laboratory—blank is a QC sample prepared by the laboratory from an analyte-free matrix that is analyzed in an analytical batch along with environmental and other QC samples. It is used to assess laboratory contamination or background interferences. Analytes were not detected in the method blanks during the above-referenced analyses, with one exception:

From report A0H0521, diesel range hydrocarbons were detected above the reporting limit in a laboratory control blank. The associated data is flagged "B-02" if the detected concentration was less than five times the blank detection, indicating the result may be biased high. In the above-referenced analyses, no data were flagged B-02.

4.4 ACCURACY

Accuracy compares the accepted reference concentration of an analyte to the concentration determined analytically. Accuracy is measured as a percent recovery. This recovery must be within a certain range or control limit for the data in an analytical batch to be considered acceptable. The analytical laboratory provides QC samples and surrogates to help determine the accuracy and acceptability of the data reported. These QC samples and surrogates are discussed below.

4.4.1 Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control duplicate samples (LCSD) were analyzed by the laboratory to assess the accuracy of the analytical methods. A minimum of one set of LCS and LCSD was analyzed per analytical batch. The LCS and LCSD are prepared from an analyte-free matrix that is spiked with known levels of compounds of concern. The concentrations are measured and compared to the known spiked levels. This comparison is expressed as percent recovery. The percent recoveries for LCS and LCSD quality control samples were within method control limits with one exception:

From report A0F0070, an LCS analysis was performed on a blank (batch 0060128) and percent recovery for NWTPH-Dx was outside of control limits. Because a duplicate LCS analysis had percent recovery within method control limits for the same batch, no data were flagged.

4.4.2 Matrix Spikes

A matrix spike QC sample is used to assess the performance of the analytical method by determining potential matrix interferences. MS and MSD analyses are performed on one environmental sample per analytical batch. An MS sample uses an environmental sample that is spiked with known concentrations of analytes of interest. The MS is then prepared and analyzed



with the same analytical procedures as environmental samples in the analytical batch. The resulting concentration of the MS is then compared to the known or true values plus the non-spiked environmental sample concentration. This comparison is expressed as a percent recovery. The percent recoveries for MS and MSD QC samples were within method control limits.

4.4.3 Surrogates

Surrogates are organic compounds that are similar in chemical composition to the analytes of interest but are not likely to be found in the environment. They are spiked at a known concentration into environmental and batch QC samples prior to sample preparation and analysis. Surrogate recoveries for environmental samples are used to evaluate matrix interference, sample preparation efficiency and analysis performance on a sample-specific basis. In some cases, the surrogate recovery was either estimated or not available due to sample dilution required for high analyte concentration and/or matrix interference. Surrogate recoveries were within control limits with the following exception:

From report A0B0728, recovery of a diesel-range surrogate for samples from wells MW-5 and MW-6 was outside laboratory control limits. The data were flagged F-18 and F-20 respectively.

4.5 PRECISION

Precision is measured by how close values of duplicate analyses are to each other. These duplicate analyses are prepared from separate aliquots of the same sample and are analyzed at the same (or similar) time. Precision in the field ensures that samples taken are representative of field concentrations; this is demonstrated by field duplicates. Analytical precision is the ability of the laboratory to reproduce results that are similar to each other; this is measured through duplicate analysis of environmental and batch QC samples. Precision is estimated by the RPD between the original analysis and the duplicate analysis.

4.5.1 Laboratory Control Sample Duplicates

The analytical batch LCS concentration of an analyte is compared to the LCSD concentration of the same analyte. The RPD is calculated from these two concentrations, which must be below a certain percentage to be considered acceptable. The RPD values for the laboratory control samples of the same batch were within the method control limits.

4.5.2 Matrix Spikes

Like the LCS/LCSD, the MS/MSD analyte concentrations are also compared to each other and expressed as an RPD. The RPD values for analytical batch MS/MSD were within the control limit.

4.5.3 Field Duplicate

A field duplicate is a second field sample collected from a selected sample location. Field duplicate samples serve as a check on laboratory precision, sampling quality, as well as potential variability of the sample matrix. The field duplicate is analyzed and compared to the original sample to assess

Appendix E – Data Quality Review 2020 Groundwater Monitoring Report NuStar Vancouver Annex Facility - Vancouver, Washington



precision. This comparison can be expressed by the RPD between the original and duplicate samples. Application of RPD values is appropriate when the analyte result is five times greater than the reporting limit. Laboratory precision decreases as the analytical result approaches the reporting limit. One field duplicate was analyzed during each quarterly monitoring event. RPD values for the field duplicates were within control limits with the following exception:

From report A0H0521, the RPD between the sample and the duplicate from well MW-11 was greater than 30% for TPH-g, toluene, ethylbenzene, xylenes, and naphthalene. The associated data were flagged R.

5.0 CONCLUSION

The overall QA objectives have been met and the data are of adequate quality for use in this project.





Wednesday, March 4, 2020 Stephanie Salisbury Cascadia Associates 5820 SW Kelly Ave Unit B Portland, OR 97239

RE: A0B0728 - Nustar Vannex - GWM 1Q 20

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A0B0728, which was received by the laboratory on 2/26/2020 at 12:19:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample reciept, unless prior arrangements have been made.

	Cooler Rece	ipt Information		
	(See Cooler Rece	eipt Form for details)		
Cooler #1 Cooler #3	0.8 degC 0.8 degC	Cooler #2	1.4 degC	

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

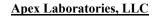




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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL REPORT FOR SAMPLES

	SAMPLE INFORM	ATION		
Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-7	A0B0728-01	Water	02/24/20 08:57	02/26/20 12:19
MW-10	A0B0728-02	Water	02/24/20 09:54	02/26/20 12:19
MW-5	A0B0728-03	Water	02/24/20 10:46	02/26/20 12:19
MW-5D	A0B0728-04	Water	02/24/20 11:29	02/26/20 12:19
MW-8	A0B0728-05	Water	02/24/20 12:13	02/26/20 12:19
MW-8D	A0B0728-06	Water	02/24/20 13:06	02/26/20 12:19
MW-9	A0B0728-07	Water	02/24/20 14:03	02/26/20 12:19
MW-6	A0B0728-08	Water	02/25/20 07:51	02/26/20 12:19
MW-6 Dup	A0B0728-09	Water	02/25/20 07:51	02/26/20 12:19
MW-1	A0B0728-10	Water	02/25/20 09:12	02/26/20 12:19
MW-11	A0B0728-11	Water	02/25/20 10:05	02/26/20 12:19
MW-3	A0B0728-12	Water	02/25/20 11:18	02/26/20 12:19
MW-2	A0B0728-13	Water	02/25/20 12:27	02/26/20 12:19
MW-4	A0B0728-14	Water	02/25/20 13:39	02/26/20 12:19
Trip Blank	A0B0728-15	Water	02/24/20 00:00	02/26/20 12:19

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Ava & Somerighini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Mustar Vannex

Project Number: GWM 1Q 20

Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	Die	sel and/or Oi	l Hydrocar	bons by NWTP	H-Dx			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-7 (A0B0728-01)				Matrix: Wat	er	Batch	: 0020856	
Diesel	ND		0.0769	mg/L	1	02/28/20 01:35	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/28/20 01:35	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 61 %	Limits: 50-150 %	6 1	02/28/20 01:35	NWTPH-Dx LL	
MW-10 (A0B0728-02)				Matrix: Wat	er	Batch	: 0020856	
Diesel	ND		0.0769	mg/L	1	02/28/20 01:55	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/28/20 01:55	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 70 %	Limits: 50-150 %	6 I	02/28/20 01:55	NWTPH-Dx LL	
MW-5 (A0B0728-03)				Matrix: Wat	er	Batch	: 0020856	
Diesel	2.40		0.0769	mg/L	1	02/27/20 21:29	NWTPH-Dx LL	F-20
Oil	ND		0.154	mg/L	1	02/27/20 21:29	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 65 %	Limits: 50-150 %	6 1	02/27/20 21:29	NWTPH-Dx LL	
MW-5D (A0B0728-04)				Matrix: Wat	er	Batch	: 0020856	
Diesel	0.109		0.0769	mg/L	1	02/27/20 21:49	NWTPH-Dx LL	F-11
Oil	ND		0.154	mg/L	1	02/27/20 21:49	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 70 %	Limits: 50-150 %	% I	02/27/20 21:49	NWTPH-Dx LL	
MW-8 (A0B0728-05)				Matrix: Wat	er	Batch	: 0020856	
Diesel	ND		0.0769	mg/L	1	02/27/20 22:10	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/27/20 22:10	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 73 %	Limits: 50-150 %	6 I	02/27/20 22:10	NWTPH-Dx LL	
MW-8D (A0B0728-06)				Matrix: Wat	er	Batch	: 0020856	
Diesel	ND		0.0769	mg/L	1	02/27/20 22:30	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/27/20 22:30	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 73 %	Limits: 50-150 %	6 I	02/27/20 22:30	NWTPH-Dx LL	
MW-9 (A0B0728-07)		Matrix: Water		er	Batch	: 0020856		
Diesel	ND		0.0769	mg/L	1	02/27/20 22:51	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/27/20 22:51	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 72 %	Limits: 50-150 %	6 1	02/27/20 22:51	NWTPH-Dx LL	
MW-6 (A0B0728-08RE1)				Matrix: Wat	er	Batch	: 0020856	
Diesel	4.02		0.385	mg/L	5	02/28/20 08:42	NWTPH-Dx LL	F-20

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or Oil F	lydrocar	bons by NWTP	H-Dx			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-6 (A0B0728-08RE1)				Matrix: Wat	er	Batch	0020856	
Oil	ND		0.769	mg/L	5	02/28/20 08:42	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	y: 56 %	Limits: 50-150 %	% 5	02/28/20 08:42	NWTPH-Dx LL	S-05
MW-6 Dup (A0B0728-09RE1)				Matrix: Wat	er	Batch	0020856	
Diesel	4.35		0.385	mg/L	5	02/28/20 09:03	NWTPH-Dx LL	F-20
Oil	ND		0.769	mg/L	5	02/28/20 09:03	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	·: 58 %	Limits: 50-150 %	% 5	02/28/20 09:03	NWTPH-Dx LL	S-05
MW-1 (A0B0728-10)				Matrix: Wat	er	Batch	0020856	
Diesel	0.201		0.0769	mg/L	1	02/27/20 23:11	NWTPH-Dx LL	F-11
Oil	ND		0.154	mg/L	1	02/27/20 23:11	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	v: 67 %	Limits: 50-150 %	% 1	02/27/20 23:11	NWTPH-Dx LL	
MW-11 (A0B0728-11)				Matrix: Wat	er	Batch	0020856	
Diesel	0.341		0.0769	mg/L	1	02/27/20 23:32	NWTPH-Dx LL	F-11, F-20
Oil	ND		0.154	mg/L	1	02/27/20 23:32	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	v: 65 %	Limits: 50-150 9	% 1	02/27/20 23:32	NWTPH-Dx LL	
MW-3 (A0B0728-12)				Matrix: Wat	er	Batch	0020856	
Diesel	0.0955		0.0769	mg/L	1	02/27/20 23:52	NWTPH-Dx LL	F-11
Oil	ND		0.154	mg/L	1	02/27/20 23:52	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	v: 67 %	Limits: 50-150 %	% 1	02/27/20 23:52	NWTPH-Dx LL	
MW-2 (A0B0728-13)				Matrix: Wat	er	Batch	0020856	
Diesel	ND		0.0769	mg/L	1	02/28/20 00:13	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/28/20 00:13	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	v: 65 %	Limits: 50-150 %	% 1	02/28/20 00:13	NWTPH-Dx LL	
MW-4 (A0B0728-14)				Matrix: Wat	er	Batch	0020856	
Diesel	ND		0.0769	mg/L	1	02/28/20 00:33	NWTPH-Dx LL	
Oil	ND		0.154	mg/L	1	02/28/20 00:33	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recovery	·: 76 %	Limits: 50-150 %	% 1	02/28/20 00:33	NWTPH-Dx LL	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

Die	esel and/or Oil H	ydrocarbons b	y NWTPH	-Dx with Silica	Gel Colu	mn Cleanup		
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-5 (A0B0728-03)				Matrix: Wate	er e	Batch	n: 0030047	
Diesel	1.02		0.0769	mg/L	1	03/02/20 23:03	NWTPH-Dx/SGC	F-18
Oil	ND		0.154	mg/L	1	03/02/20 23:03	NWTPH-Dx/SGC	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 45 %	Limits: 50-150 %	5 1	03/02/20 23:03	NWTPH-Dx/SGC	S-06
MW-6 (A0B0728-08)				Matrix: Wate	er	Batch	ı: 0030047	
Diesel	1.45		0.0769	mg/L	1	03/02/20 23:23	NWTPH-Dx/SGC	F-20
Oil	ND		0.154	mg/L	1	03/02/20 23:23	NWTPH-Dx/SGC	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 46 %	Limits: 50-150 %	1	03/02/20 23:23	NWTPH-Dx/SGC	S-06
MW-6 Dup (A0B0728-09)				Matrix: Wate	er .	Batch	n: 0030047	
Diesel	1.56		0.0769	mg/L	1	03/02/20 23:42	NWTPH-Dx/SGC	F-20
Oil	ND		0.154	mg/L	1	03/02/20 23:42	NWTPH-Dx/SGC	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 50 %	Limits: 50-150 %	<u> </u>	03/02/20 23:42	NWTPH-Dx/SGC	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons	Benzene th	rough Naphth	alene) by	NWTPH-Gx		
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-7 (A0B0728-01)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 13:53	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 97 %	Limits: 50-150 %	6 I	02/27/20 13:53	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	6 1	02/27/20 13:53	NWTPH-Gx (MS)	
MW-10 (A0B0728-02)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 14:20	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 97%	Limits: 50-150 %	6 I	02/27/20 14:20	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	6 1	02/27/20 14:20	NWTPH-Gx (MS)	
MW-5 (A0B0728-03)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	23.4		2.00	mg/L	20	02/27/20 18:22	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 99 %	Limits: 50-150 %	6 I	02/27/20 18:22	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			99 %	50-150 %	6 1	02/27/20 18:22	NWTPH-Gx (MS)	
MW-5D (A0B0728-04)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 14:47	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 98 %	Limits: 50-150 %	6 I	02/27/20 14:47	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			100 %	50-150 %	6 1	02/27/20 14:47	NWTPH-Gx (MS)	
MW-8 (A0B0728-05)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 15:14	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 97 %	Limits: 50-150 %	6 I	02/27/20 15:14	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			100 %	50-150 %	6 I	02/27/20 15:14	NWTPH-Gx (MS)	
MW-8D (A0B0728-06)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 15:40	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 97 %	Limits: 50-150 %	6 1	02/27/20 15:40	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	ó 1	02/27/20 15:40	NWTPH-Gx (MS)	
MW-9 (A0B0728-07)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 16:07	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 97 %	Limits: 50-150 %	6 I	02/27/20 16:07	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	6 1	02/27/20 16:07	NWTPH-Gx (MS)	
MW-6 (A0B0728-08)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	15.6		2.00	mg/L	20	02/27/20 19:43	NWTPH-Gx (MS)	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons (B	enzene tl	hrough Naphtha	alene) by	NWTPH-Gx		
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-6 (A0B0728-08)				Matrix: Wate	er	Batch	: 0020845	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	v: 99 %	Limits: 50-150 %	1	02/27/20 19:43	NWTPH-Gx (MS)	
I,4-Difluorobenzene (Sur)			100 %	50-150 %	1	02/27/20 19:43	NWTPH-Gx (MS)	
MW-6 Dup (A0B0728-09)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	14.8		2.00	mg/L	20	02/27/20 20:36	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 99 %	Limits: 50-150 %	1	02/27/20 20:36	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			99 %	50-150 %	1	02/27/20 20:36	NWTPH-Gx (MS)	
MW-1 (A0B0728-10)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 16:34	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 98 %	Limits: 50-150 %	1	02/27/20 16:34	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	1	02/27/20 16:34	NWTPH-Gx (MS)	
MW-11 (A0B0728-11)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	2.65		1.00	mg/L	10	02/27/20 21:03	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 98 %	Limits: 50-150 %	1	02/27/20 21:03	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			98 %	50-150 %	1	02/27/20 21:03	NWTPH-Gx (MS)	
MW-3 (A0B0728-12)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 17:01	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	v: 98 %	Limits: 50-150 %	1	02/27/20 17:01	NWTPH-Gx (MS)	
I,4-Difluorobenzene (Sur)			100 %	50-150 %	1	02/27/20 17:01	NWTPH-Gx (MS)	
MW-2 (A0B0728-13)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 17:28	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	v: 96 %	Limits: 50-150 %	1	02/27/20 17:28	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	1	02/27/20 17:28	NWTPH-Gx (MS)	
MW-4 (A0B0728-14)				Matrix: Wate	er	Batch	: 0020845	
Gasoline Range Organics	ND		0.100	mg/L	1	02/27/20 17:55	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 96 %	Limits: 50-150 %	1	02/27/20 17:55	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	1	02/27/20 17:55	NWTPH-Gx (MS)	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	Selec	ted volatile Org	ganic Con	pounds by EPA	8260C			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-7 (A0B0728-01)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 13:53	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 13:53	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 13:53	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 13:53	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 13:53	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 13:53	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	v: 105 %	Limits: 80-120 %	1	02/27/20 13:53	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120 %	1	02/27/20 13:53	EPA 8260C	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	02/27/20 13:53	EPA 8260C	
MW-10 (A0B0728-02)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 14:20	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 14:20	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 14:20	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 14:20	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 14:20	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 14:20	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	v: 104 %	Limits: 80-120 %	1	02/27/20 14:20	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120 %	1	02/27/20 14:20	EPA 8260C	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	02/27/20 14:20	EPA 8260C	
MW-5 (A0B0728-03)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		4.00	ug/L	20	02/27/20 18:22	EPA 8260C	
Ethylbenzene	176		10.0	ug/L	20	02/27/20 18:22	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20	02/27/20 18:22	EPA 8260C	
Naphthalene	1520		40.0	ug/L	20	02/27/20 18:22	EPA 8260C	
Toluene	ND		20.0	ug/L	20	02/27/20 18:22	EPA 8260C	
Xylenes, total	809		30.0	ug/L	20	02/27/20 18:22	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	v: 103 %	Limits: 80-120 %	1	02/27/20 18:22	EPA 8260C	
Toluene-d8 (Surr)			98 %	80-120 %	1	02/27/20 18:22	EPA 8260C	
4-Bromofluorobenzene (Surr)			98 %	80-120 %	1	02/27/20 18:22	EPA 8260C	
MW-5D (A0B0728-04)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 14:47	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 14:47	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 14:47	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 14:47	EPA 8260C	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	Selec	ted Volatile Or	ganic Con	pounds by EPA	8260C			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5D (A0B0728-04)				Matrix: Wate	r	Batch:	0020845	
Toluene	ND		1.00	ug/L	1	02/27/20 14:47	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 14:47	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 103 %	Limits: 80-120 %	1	02/27/20 14:47	EPA 8260C	
Toluene-d8 (Surr)			98 %	80-120 %	1	02/27/20 14:47	EPA 8260C	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	02/27/20 14:47	EPA 8260C	
MW-8 (A0B0728-05)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 15:14	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 15:14	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 15:14	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 15:14	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 15:14	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 15:14	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 104 %	Limits: 80-120 %	1	02/27/20 15:14	EPA 8260C	
Toluene-d8 (Surr)			100 %	80-120 %	1	02/27/20 15:14	EPA 8260C	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	02/27/20 15:14	EPA 8260C	
MW-8D (A0B0728-06)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 15:40	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 15:40	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 15:40	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 15:40	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 15:40	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 15:40	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 105 %	Limits: 80-120 %	1	02/27/20 15:40	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120 %	1	02/27/20 15:40	EPA 8260C	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	02/27/20 15:40	EPA 8260C	
MW-9 (A0B0728-07)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 16:07	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 16:07	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 16:07	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 16:07	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 16:07	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 16:07	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 104 %	Limits: 80-120 %	1	02/27/20 16:07	EPA 8260C	
Toluene-d8 (Surr)			98 %	80-120 %	1	02/27/20 16:07	EPA 8260C	

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	190 1740 ND 340 30.8 420		Reporting Limit ery: 100 % 4.00 10.0 20.0 40.0 20.0 30.0	Units Matrix: Water Limits: 80-120 % Matrix: Water ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/	1	02/27/20 16:07	Method Ref. 0020845 EPA 8260C 0020845 EPA 8260C EPA 8260C EPA 8260C	Notes
MW-9 (A0B0728-07) Surrogate: 4-Bromofluorobenzene (Surr) MW-6 (A0B0728-08) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	190 1740 ND 340 30.8	Recov	4.00 % 4.00 10.0 20.0 40.0 20.0 30.0	Matrix: Water Limits: 80-120 % Matrix: Water ug/L ug/L ug/L ug/L ug/L ug/L ug/L	r 1 r 20 20 20 20 20	Batch: (02/27/20 16:07 Batch: (02/27/20 19:43 02/27/20 19:43 02/27/20 19:43	0020845 EPA 8260C 0020845 EPA 8260C EPA 8260C EPA 8260C	Note:
Surrogate: 4-Bromofluorobenzene (Surr) MW-6 (A0B0728-08) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	1740 ND 340 30.8		4.00 10.0 20.0 40.0 20.0 30.0	Limits: 80-120 % Matrix: Water ug/L ug/L ug/L ug/L ug/L ug/L ug/L	20 20 20 20 20	02/27/20 16:07 Batch: (02/27/20 19:43 02/27/20 19:43 02/27/20 19:43	EPA 8260C D020845 EPA 8260C EPA 8260C EPA 8260C	
MW-6 (A0B0728-08) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr)	1740 ND 340 30.8		4.00 10.0 20.0 40.0 20.0 30.0	Matrix: Water ug/L ug/L ug/L ug/L ug/L ug/L ug/L	20 20 20 20 20	Batch: 02/27/20 19:43 02/27/20 19:43 02/27/20 19:43	0020845 EPA 8260C EPA 8260C EPA 8260C	
Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr)	1740 ND 340 30.8	 	10.0 20.0 40.0 20.0 30.0	ug/L ug/L ug/L ug/L ug/L	20 20 20 20 20	02/27/20 19:43 02/27/20 19:43 02/27/20 19:43	EPA 8260C EPA 8260C EPA 8260C	
Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr)	1740 ND 340 30.8	 	10.0 20.0 40.0 20.0 30.0	ug/L ug/L ug/L ug/L	20 20 20	02/27/20 19:43 02/27/20 19:43	EPA 8260C EPA 8260C	
Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene-d8 (Surr)	ND 340 30.8	 	20.0 40.0 20.0 30.0	ug/L ug/L ug/L	20 20	02/27/20 19:43	EPA 8260C	
Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	340 30.8		40.0 20.0 30.0	ug/L ug/L	20			
Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	30.8		20.0 30.0	ug/L		02/27/20 19:43	ED4 0260G	
Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			30.0	•	20		EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	420	 Recov		ng/I		02/27/20 19:43	EPA 8260C	
Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene		Recov	10101	ug/L	20	02/27/20 19:43	EPA 8260C	
4-Bromofluorobenzene (Surr) MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			ery: 101 %	Limits: 80-120 %	1	02/27/20 19:43	EPA 8260C	
MW-6 Dup (A0B0728-09) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			97 %	80-120 %	1	02/27/20 19:43	EPA 8260C	
Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			99 %	80-120 %	1	02/27/20 19:43	EPA 8260C	
Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene				Matrix: Water	r	Batch:	0020845	
Methyl tert-butyl ether (MTBE) Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	186		4.00	ug/L	20	02/27/20 20:36	EPA 8260C	
Naphthalene Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	1680		10.0	ug/L	20	02/27/20 20:36	EPA 8260C	
Toluene Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	ND		20.0	ug/L	20	02/27/20 20:36	EPA 8260C	
Xylenes, total Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	329		40.0	ug/L	20	02/27/20 20:36	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr) Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	28.8		20.0	ug/L	20	02/27/20 20:36	EPA 8260C	
Toluene-d8 (Surr) 4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene	405		30.0	ug/L	20	02/27/20 20:36	EPA 8260C	
4-Bromofluorobenzene (Surr) MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene		Recov	ery: 102 %	Limits: 80-120 %	1	02/27/20 20:36	EPA 8260C	
MW-1 (A0B0728-10) Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			98 %	80-120 %	1	02/27/20 20:36	EPA 8260C	
Benzene Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene			99 %	80-120 %	1	02/27/20 20:36	EPA 8260C	
Ethylbenzene Methyl tert-butyl ether (MTBE) Naphthalene Toluene				Matrix: Water	r	Batch:	0020845	
Methyl tert-butyl ether (MTBE) Naphthalene Toluene	ND		0.200	ug/L	1	02/27/20 16:34	EPA 8260C	
Naphthalene Toluene	ND		0.500	ug/L	1	02/27/20 16:34	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 16:34	EPA 8260C	
	ND		2.00	ug/L	1	02/27/20 16:34	EPA 8260C	
Xylenes, total	ND		1.00	ug/L	1	02/27/20 16:34	EPA 8260C	
	ND		1.50	ug/L	1	02/27/20 16:34	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recov	ery: 105 %	Limits: 80-120 %	1	02/27/20 16:34	EPA 8260C	
Toluene-d8 (Surr)			100 %	80-120 %	1	02/27/20 16:34	EPA 8260C	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	02/27/20 16:34	EPA 8260C	
- MW-11 (A0B0728-11)				Matrix: Water	r	Batch:	0020845	
Benzene			2.00	ug/L	10	02/27/20 21:03	EPA 8260C	

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Gwa & Zomenighini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Mustar Vannex
Project Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

ANALYTICAL SAMPLE RESULTS

	Sample	Detection	Reporting			Date		
Analyte	Sample Result	Limit	Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-11 (A0B0728-11)		-	•	Matrix: Wate			0020845	
Ethylbenzene	292		5.00	ug/L	10	02/27/20 21:03	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	02/27/20 21:03	EPA 8260C	
Naphthalene	25.7		20.0	ug/L	10	02/27/20 21:03	EPA 8260C	
Toluene	ND		10.0	ug/L	10	02/27/20 21:03	EPA 8260C	
Xylenes, total	257		15.0	ug/L	10	02/27/20 21:03	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:		Limits: 80-120 %	1	02/27/20 21:03	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120 %	1	02/27/20 21:03	EPA 8260C	
4-Bromofluorobenzene (Surr)			99 %	80-120 %	1	02/27/20 21:03	EPA 8260C	
MW-3 (A0B0728-12)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 17:01	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 17:01	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 17:01	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 17:01	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 17:01	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 17:01	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	104 %	Limits: 80-120 %	1	02/27/20 17:01	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120 %	1	02/27/20 17:01	EPA 8260C	
4-Bromofluorobenzene (Surr)			99 %	80-120 %	1	02/27/20 17:01	EPA 8260C	
MW-2 (A0B0728-13)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 17:28	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 17:28	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 17:28	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 17:28	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 17:28	EPA 8260C	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 17:28	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	104 %	Limits: 80-120 %	1	02/27/20 17:28	EPA 8260C	
Toluene-d8 (Surr)		•	101 %	80-120 %	1	02/27/20 17:28	EPA 8260C	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	02/27/20 17:28	EPA 8260C	
MW-4 (A0B0728-14)				Matrix: Wate	r	Batch:	0020845	
Benzene	ND		0.200	ug/L	1	02/27/20 17:55	EPA 8260C	
Ethylbenzene	ND		0.500	ug/L	1	02/27/20 17:55	EPA 8260C	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	02/27/20 17:55	EPA 8260C	
Naphthalene	ND		2.00	ug/L	1	02/27/20 17:55	EPA 8260C	
Toluene	ND		1.00	ug/L	1	02/27/20 17:55	EPA 8260C	

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Assa & Jamenyhini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

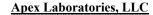
ANALYTICAL SAMPLE RESULTS

	Select	ed Volatile Org	ganic Com	pounds by El	PA 8260C			
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-4 (A0B0728-14)				Matrix: Wa	ter	Batch:	0020845	
Xylenes, total	ND		1.50	ug/L	1	02/27/20 17:55	EPA 8260C	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 104 %	Limits: 80-120	% 1	02/27/20 17:55	EPA 8260C	
Toluene-d8 (Surr)			99 %	80-120	% 1	02/27/20 17:55	EPA 8260C	
4-Bromofluorobenzene (Surr)			100 %	80-120	% 1	02/27/20 17:55	EPA 8260C	

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Awa & Somenighini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbor	s by NW7	PH-Dx					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0020856 - EPA 3510C ((Fuels/Acid	Ext.)					Wate	er				
Blank (0020856-BLK1)		Prepared	: 02/27/20 11:1	15 Analyz	ed: 02/27/2	0 21:29						
NWTPH-Dx LL												
Diesel	ND		0.0727	mg/L	1							
Oil	ND		0.145	mg/L	1							
Surr: o-Terphenyl (Surr)		Rece	overy: 83 %	Limits: 50)-150 %	Dilı	ution: 1x					
LCS (0020856-BS1)		Prepared	: 02/27/20 11:1	15 Analyz	ed: 02/27/2	0 21:49						
NWTPH-Dx LL												
Diesel	0.407		0.0800	mg/L	1	0.500		81	58 - 115%			
Surr: o-Terphenyl (Surr)		Rece	overy: 87 %	Limits: 50)-150 %	Dilı	ution: 1x					
LCS Dup (0020856-BSD1)		Prepared	: 02/27/20 11:1	15 Analyz	ed: 02/27/2	0 22:10						Q-19
NWTPH-Dx LL												
Diesel	0.361		0.0800	mg/L	1	0.500		72	58 - 115%	12	20%	
Surr: o-Terphenyl (Surr)		Rece	overy: 88 %	Limits: 50	0-150 %	Dilı	ution: 1x					

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALITY CONTROL (QC) SAMPLE RESULTS

	Diesel and/or Oil Hydrocarbons by NWTPH-Dx with Silica Gel Column Cleanup											
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits		RPD Limit	Notes
Batch 0030047 - EPA 3510C	(Fuels/Acid	Ext.) w/Silio	a Gel				Wat	er				
Blank (0030047-BLK1)		Prepared	: 02/27/20 11:1	15 Analyz	ed: 03/02/20	0 22:03						
NWTPH-Dx/SGC												
Diesel	ND		0.0727	mg/L	1							
Oil	ND		0.145	mg/L	1							
Surr: o-Terphenyl (Surr)		Reco	overy: 74 %	Limits: 50	1-150 %	Dilu	ution: 1x					
LCS (0030047-BS1)		Prepared	: 02/27/20 11:1	5 Analyz	ed: 03/02/20) 22:23						
NWTPH-Dx/SGC												
Diesel	0.380		0.0800	mg/L	1	0.500		76	58 - 115%			
Surr: o-Terphenyl (Surr)		Reco	overy: 79 %	Limits: 50	1-150 %	Dilu	ution: 1x					
LCS Dup (0030047-BSD1)		Prepared	: 02/27/20 11:1	5 Analyz	ed: 03/02/20) 22:43						Q-1
NWTPH-Dx/SGC		- F										
Diesel	0.312		0.0800	mg/L	1	0.500		62	58 - 115%	20	20%	
Surr: o-Terphenyl (Surr)		Reco	overy: 74 %	Limits: 50	-150 %	 Dilu	ution: 1x					

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Mustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolir	ne Range H	lydrocarbo	ons (Benz	ene thro	ugh Naph	thalene)	by NWTF	PH-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0020845 - EPA 5030B							Wat	er				
Blank (0020845-BLK1)		Prepared	: 02/27/20 10:	:00 Analyz	ed: 02/27/2	0 12:32						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Reco	overy: 95 %	Limits: 50	-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			100 %	50	-150 %		"					
LCS (0020845-BS2)		Prepared	: 02/27/20 10:	:00 Analyz	ed: 02/27/2	0 12:05						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.455		0.100	mg/L	1	0.500		91	80 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Reco	very: 100 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
1,4-Difluorobenzene (Sur)			99 %	50	-150 %		"					
Duplicate (0020845-DUP1)		Prepared	: 02/27/20 12:	:11 Analyz	ed: 02/27/2	0 18:49						
QC Source Sample: MW-5 (A0B0	728-03)											
NWTPH-Gx (MS)												
Gasoline Range Organics	24.1		2.00	mg/L	20		23.4			3	30%	
Surr: 4-Bromofluorobenzene (Sur)		Reco	overy: 99 %	Limits: 50	-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			104 %	50	-150 %		"					
Duplicate (0020845-DUP2)		Prepared	: 02/27/20 12:	:11 Analyz	ed: 02/27/2	0 20:10						
QC Source Sample: MW-6 (A0B0 NWTPH-Gx (MS)	728-08)											
Gasoline Range Organics	16.0		2.00	mg/L	20		15.6			3	30%	
Surr: 4-Bromofluorobenzene (Sur)	10.0	D	very: 101 %	Limits: 50		D:1.	tion: lx			3	30 / 0	
		кесо	-			Dili	ition: 1x					
1,4-Difluorobenzene (Sur)			101 %	50	-150 %		"					

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239

F

Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

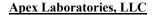
QUALITY CONTROL (QC) SAMPLE RESULTS

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0020845 - EPA 5030B							Wat	er				
Blank (0020845-BLK1)		Prepared	: 02/27/20 10:0	00 Analyz	ed: 02/27/20	0 12:32						
EPA 8260C												
Benzene	ND		0.200	ug/L	1							
1,2-Dibromoethane (EDB)	ND		0.500	ug/L	1							
1,2-Dichloroethane (EDC)	ND		0.500	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Isopropylbenzene	ND		1.00	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
Toluene	ND		1.00	ug/L	1							
1,2,4-Trimethylbenzene	ND		1.00	ug/L	1							
1,3,5-Trimethylbenzene	ND		1.00	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Recon	very: 103 %	Limits: 80	-120 %	Dilu	ution: 1x					
Toluene-d8 (Surr)			100 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			102 %	80	-120 %		"					
LCS (0020845-BS1)		Prepared	: 02/27/20 10:0	00 Analyz	ed: 02/27/20	0 11:29						
EPA 8260C												
Benzene	20.1		0.200	ug/L	1	20.0		101	80 - 120%			
1,2-Dibromoethane (EDB)	20.8		0.500	ug/L	1	20.0		104	80 - 120%			
1,2-Dichloroethane (EDC)	21.6		0.500	ug/L	1	20.0		108	80 - 120%			
Ethylbenzene	19.4		0.500	ug/L	1	20.0		97	80 - 120%			
Isopropylbenzene	19.7		1.00	ug/L	1	20.0		98	80 - 120%			
Methyl tert-butyl ether (MTBE)	19.8		1.00	ug/L	1	20.0		99	80 - 120%			
Naphthalene	18.7		2.00	ug/L	1	20.0		93	80 - 120%			
Гoluene	19.1		1.00	ug/L	1	20.0		96	80 - 120%			
1,2,4-Trimethylbenzene	19.7		1.00	ug/L	1	20.0		98	80 - 120%			
1,3,5-Trimethylbenzene	20.0		1.00	ug/L	1	20.0		100	80 - 120%			
Kylenes, total	57.8		1.50	ug/L	1	60.0		96	80 - 120%			
urr: 1,4-Difluorobenzene (Surr)		Reco		Limits: 80			ıtion: 1x					
Toluene-d8 (Surr)		neco	97 %		-120 %	Ditti						
4-Bromofluorobenzene (Surr)			97 % 97 %		-120 %		"					

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239

F

Project Number: Nustar Vannex

Project Number: GWM 1Q 20

Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 82600	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0020845 - EPA 5030B							Wat	er				
Duplicate (0020845-DUP1)		Prepared	: 02/27/20 12:	11 Analyz	ed: 02/27/20	0 18:49						
QC Source Sample: MW-5 (A0B0	728-03)											
EPA 8260C												
Benzene	ND		4.00	ug/L	20		ND				30%	
1,2-Dibromoethane (EDB)	ND		10.0	ug/L	20		ND				30%	
1,2-Dichloroethane (EDC)	ND		10.0	ug/L	20		ND				30%	
Ethylbenzene	176		10.0	ug/L	20		176			0.3	30%	
Isopropylbenzene	110		20.0	ug/L	20		113			3	30%	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20		ND				30%	
Naphthalene	1580		40.0	ug/L	20		1520			4	30%	
Toluene	ND		20.0	ug/L	20		ND				30%	
1,2,4-Trimethylbenzene	1070		20.0	ug/L	20		1050			2	30%	
1,3,5-Trimethylbenzene	958		20.0	ug/L	20		950			0.8	30%	
Xylenes, total	799		30.0	ug/L	20		809			1	30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 102 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			101 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			98 %	80	-120 %		"					
Duplicate (0020845-DUP2)		Prepared	: 02/27/20 12:	11 Analyz	ed: 02/27/20	0 20:10						
QC Source Sample: MW-6 (A0B0	728-08)											
EPA 8260C												
Benzene	192		4.00	ug/L	20		190			0.8	30%	
1,2-Dibromoethane (EDB)	ND		10.0	ug/L	20		ND				30%	
1,2-Dichloroethane (EDC)	ND		10.0	ug/L	20		ND				30%	
Ethylbenzene	1770		10.0	ug/L	20		1740			2	30%	
Sopropylbenzene	60.9		20.0	ug/L	20		58.6			4	30%	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20		ND				30%	
Naphthalene	352		40.0	ug/L	20		340			4	30%	
Гoluene	30.5		20.0	ug/L	20		30.8			1	30%	
1,2,4-Trimethylbenzene	166		20.0	ug/L	20		160			3	30%	
1,3,5-Trimethylbenzene	39.1		20.0	ug/L	20		38.5			2	30%	
Xylenes, total	426		30.0	ug/L	20		420			2	30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 103 %	Limits: 80	0-120 %	Dilı	ution: 1x					
			98 %									

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex
GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALITY CONTROL (QC) SAMPLE RESULTS

	Selected Volatile Organic Compounds by EPA 8260C											
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0020845 - EPA 5030B							Wat	er				
Duplicate (0020845-DUP2)		Prepared	: 02/27/20 12:	11 Analyz	ed: 02/27/2	0 20:10						
QC Source Sample: MW-6 (A0B0	728-08)											
Surr: 4-Bromofluorobenzene (Surr)		Rece	overy: 98 %	Limits: 80	0-120 %	Dilı	ıtion: 1x					
Matrix Spike (0020845-MS1)		Prepared	: 02/27/20 12:	11 Analyz	ed: 02/27/2	0 21:30						
QC Source Sample: MW-11 (A0B EPA 8260C	0728-11)											
Benzene	202		2.00	ug/L	10	200	3.97	99	79 - 120%			
1,2-Dibromoethane (EDB)	203		5.00	ug/L	10	200	ND	102	77 - 121%			
1,2-Dichloroethane (EDC)	209		5.00	ug/L	10	200	ND	104	73 - 128%			
Ethylbenzene	483		5.00	ug/L	10	200	292	96	79 - 121%			
Isopropylbenzene	211		10.0	ug/L	10	200	9.01	101	72 - 131%			
Methyl tert-butyl ether (MTBE)	191		10.0	ug/L	10	200	ND	96	71 - 124%			
Naphthalene	210		20.0	ug/L	10	200	25.7	92	61 - 128%			
Гoluene	191		10.0	ug/L	10	200	ND	95	80 - 121%			
1,2,4-Trimethylbenzene	313		10.0	ug/L	10	200	95.3	109	76 - 124%			
1,3,5-Trimethylbenzene	199		10.0	ug/L	10	200	ND	100	75 - 124%			
Xylenes, total	851		15.0	ug/L	10	600	257	99	79 - 121%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 101 %	Limits: 80	0-120 %	Dilı	ıtion: 1x					
Toluene-d8 (Surr)			97 %	80	0-120 %		"					
4-Bromofluorobenzene (Surr)			97 %	80	-120 %		"					

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx							
Prep: EPA 3510C (Fuels/Acid Ext.)				Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0020856							
A0B0728-01	Water	NWTPH-Dx LL	02/24/20 08:57	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-02	Water	NWTPH-Dx LL	02/24/20 09:54	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-03	Water	NWTPH-Dx LL	02/24/20 10:46	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-04	Water	NWTPH-Dx LL	02/24/20 11:29	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-05	Water	NWTPH-Dx LL	02/24/20 12:13	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-06	Water	NWTPH-Dx LL	02/24/20 13:06	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-07	Water	NWTPH-Dx LL	02/24/20 14:03	02/27/20 12:46	1040mL/2mL	1000mL/2mL	0.96
A0B0728-08RE1	Water	NWTPH-Dx LL	02/25/20 07:51	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-09RE1	Water	NWTPH-Dx LL	02/25/20 07:51	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-10	Water	NWTPH-Dx LL	02/25/20 09:12	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-11	Water	NWTPH-Dx LL	02/25/20 10:05	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-12	Water	NWTPH-Dx LL	02/25/20 11:18	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-13	Water	NWTPH-Dx LL	02/25/20 12:27	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96
A0B0728-14	Water	NWTPH-Dx LL	02/25/20 13:39	02/27/20 11:15	1040mL/2mL	1000mL/2mL	0.96

	Die	sel and/or Oil Hydrocar	bons by NWTPH-D	x with Silica Gel Col	umn Cleanup		
Prep: EPA 3510C (Fuels/Acid Ext.) w/Silica Gel			Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0030047							
A0B0728-03	Water	NWTPH-Dx/SGC	02/24/20 10:46	02/27/20 12:46			0.96
A0B0728-08	Water	NWTPH-Dx/SGC	02/25/20 07:51	02/27/20 11:15			0.96
A0B0728-09	Water	NWTPH-Dx/SGC	02/25/20 07:51	02/27/20 11:15			0.96

	Gas	soline Range Hydrocart	oons (Benzene thro	ugh Naphthalene) b	y NWTPH-Gx		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0020845							
A0B0728-01	Water	NWTPH-Gx (MS)	02/24/20 08:57	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-02	Water	NWTPH-Gx (MS)	02/24/20 09:54	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-03	Water	NWTPH-Gx (MS)	02/24/20 10:46	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-04	Water	NWTPH-Gx (MS)	02/24/20 11:29	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-05	Water	NWTPH-Gx (MS)	02/24/20 12:13	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-06	Water	NWTPH-Gx (MS)	02/24/20 13:06	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-07	Water	NWTPH-Gx (MS)	02/24/20 14:03	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00

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Gwa A Zmenyhini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

SAMPLE PREPARATION INFORMATION

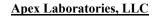
	Gas	soline Range Hydrocart	oons (Benzene thro	ugh Naphthalene) b	y NWTPH-Gx		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A0B0728-08	Water	NWTPH-Gx (MS)	02/25/20 07:51	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-09	Water	NWTPH-Gx (MS)	02/25/20 07:51	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-10	Water	NWTPH-Gx (MS)	02/25/20 09:12	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-11	Water	NWTPH-Gx (MS)	02/25/20 10:05	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-12	Water	NWTPH-Gx (MS)	02/25/20 11:18	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-13	Water	NWTPH-Gx (MS)	02/25/20 12:27	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-14	Water	NWTPH-Gx (MS)	02/25/20 13:39	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00

		Selected Vo	latile Organic Compo	ounds by EPA 82600)		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0020845							
A0B0728-01	Water	EPA 8260C	02/24/20 08:57	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-02	Water	EPA 8260C	02/24/20 09:54	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-03	Water	EPA 8260C	02/24/20 10:46	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-04	Water	EPA 8260C	02/24/20 11:29	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-05	Water	EPA 8260C	02/24/20 12:13	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-06	Water	EPA 8260C	02/24/20 13:06	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-07	Water	EPA 8260C	02/24/20 14:03	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-08	Water	EPA 8260C	02/25/20 07:51	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-09	Water	EPA 8260C	02/25/20 07:51	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-10	Water	EPA 8260C	02/25/20 09:12	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-11	Water	EPA 8260C	02/25/20 10:05	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-12	Water	EPA 8260C	02/25/20 11:18	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-13	Water	EPA 8260C	02/25/20 12:27	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00
A0B0728-14	Water	EPA 8260C	02/25/20 13:39	02/27/20 12:11	5mL/5mL	5mL/5mL	1.00

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Goas Smerighini





Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:GWM 1Q 20Portland, OR 97239Project Manager:Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

F-11	the hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
F-18	Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
F-20	Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
S-05	Surrogate recovery is estimated due to sample dilution required for high analyte concentration and/or matrix interference.
S-06	Surrogate recovery is outside of established control limits.

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Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:GWM 1Q 20Report ID:Portland, OR 97239Project Manager:Stephanie SalisburyA0B0728 - 03 04 20 1341

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")

See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

"---" QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

- -For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
- -For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

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Apex Laboratories, LLC

6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 EPA ID: OR01039

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:GWM 1Q 20Portland, OR 97239Project Manager:Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

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Apex Laboratories, LLC

6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 EPA ID: OR01039

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:GWM 1Q 20Portland, OR 97239Project Manager:Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the <u>exception</u> of any analyte(s) listed below:

Apex Laboratories

Matrix Analysis TNI_ID Analyte TNI_ID Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

APEX LABS	CHAIN OF CUSTODY	100 X Lab # ADDO728 COC 1 of 1
12232 S.W. Garden Place, Tigard, 1	12232 S.W. Garden Place, Tigard, OR 97223 Ph.: 503-718-2323 Fax: 503-718-0333	#O Che
Company: Cascalla Associates	otes Project Nigr. Stephanie Salisbury Project Name: Nu Stay Vannex GUM (Chall)	Name: Nu Stay Vennex Gh/M 10000 #
Address 5800 SW Jully He B, Portland	1 Ste B, Parthaud OK Phone (505) 906-6577	Brya
Sampled by: J. Weather they	34	ANALYSIS REQUEST & STOCKOCKS. CC
Site Location: OR (WA)	D OCS	(8)
Other:	3	COFS DISS LE NATUR VARIENT VARIENT LO LO SIM BATE
SAMPLEID	1 0978 1 0978 1 0978 1 0978 1 MN 1 MN	1700-C 17
MW-7	1/2/ 857(W) 5 /V	
2 MW-10	45.4	
my-5	2/0/10	
MW-5D	5711	
MW-8	123	
MM-8D	130k	
p-61/mg /	500-1	
% MW-€	2/15 751	
MM-GDW	1 451	
, 1-MW	716 3	2
Normal Turn Around Time (TAT) = 10 Business Days	VES NO	SPECIAL INSTRUCTIONS:
a area	1 Day 2 Day 3 Day * 2 Tr	* Jan (Let as 12/4) 14 report
A.A.J. Kequested (circle)	4 DAY 5 DAY Other: Note.	Note: To Mul-5, MW-6, MW-6 DWD analyte and
	The state of the s	Provide results without and with Silice 1, (leaning
KELINOUISHED BY:	2/11	ED BY: RECEIVED BY:
Signature: 1970	Date: C. W. Signature: & Signature:	Date: Signature: Date:
Printed Name. John Livia John	Princed Name John Wilcolf As Arther (2) Princed Name EK JOHN Time 1219 Princed Name.	Tanc. Printed Name: Time
Company ascalla Assoc	Company: APEX LABS Company	Сирину
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	* manager (Control of Control of	

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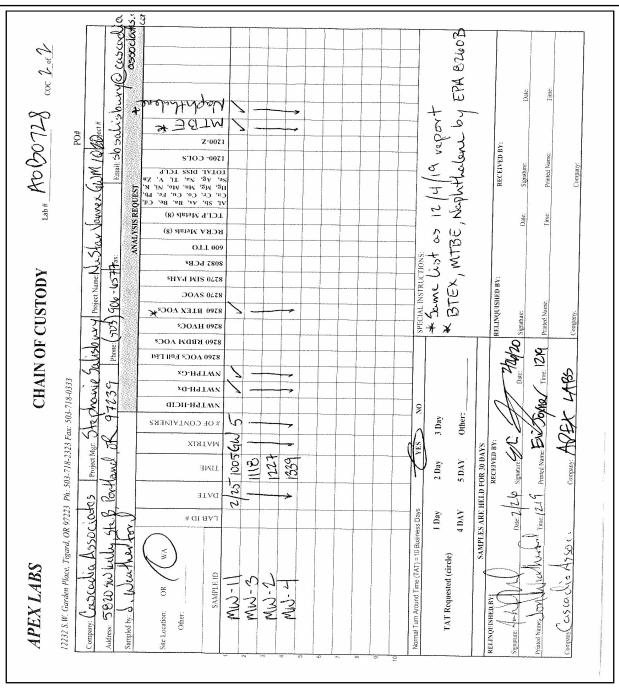
Goas Smerighini





<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: GWM 1Q 20
Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341



Apex Laboratories

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Apex Laboratories, LLC



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 <u>EPA ID: OR01039</u>

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Mustar Vannex

Project Number: GWM 1Q 20

Project Manager: Stephanie Salisbury

Report ID: A0B0728 - 03 04 20 1341

	Cascadia			Element V	VO#: A0 P	50728
		ar Vannex				
Delivery Date/time Delivered Cooler Ir Chain of 6 Signed/da Signed/da Temperat Received Temp. bla	Info: e received: 2/24 by: Apex X Cli enspection Date Custody included? ated by client? ated by Apex?	entESSFe c/time inspected: 2/ Yes _No Yes _No Yes _No Cooler #1 Cooler 0.8 1.4	By: EJ dExUPS_ 24/20	SwiftSer 1 30 0 By stody seals?	Yes	No_*
If some co Out of ten Samples	at of temp? (YN) colers are in temp inperature samples Inspection: Date	Possible reason why and some out, were form initiated? Yee/time inspected:	green dots appl s/No/NA <u> //////</u> @ /		-	_
>=>	•	No Commer				
Bottle lab	els/COCs agree?	Yes No X C	Comments:	1/2 HU ,		D rends 1/29
Bottle lab Re COC/cont	els/COCs agree?		Comments:	1/2 HU.	bullers tel o	D rends 1/29
Bottle lab Pe COC/cont Container Do VOA Comment Water san	tainer discrepancies/volumes receive	Yes No X C 3 trip 61 es form initiated? Y d appropriate for and headspace? Yes 3/3 Voas e : Yes No NA	Comments:	NA KONO CON	tel of	D vends yra
Bottle lab Pe COC/cont Container Do VOA Comment Water san Comment	tainer discrepancies/volumes receive vials have visible seedin	Yes No X C 3 trip 61 es form initiated? Y d appropriate for and headspace? Yes 3/3 Voas e : Yes No NA	Comments:	NA KONDONA A MW 8D iate? Yes Y No	milws tel or ments: NA	D vends 429

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Apex Laboratories, LLC



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Monday, June 8, 2020 Stephanie Salisbury Cascadia Associates 5820 SW Kelly Ave Unit B Portland, OR 97239

RE: A0F0070 - Nustar Vannex - 0060-001-001

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A0F0070, which was received by the laboratory on 6/2/2020 at 5:16:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample reciept, unless prior arrangements have been made.

Cooler	Receipt	Information

(See Cooler Receipt Form for details)

Cooler#1 4.9 degC Cooler#2 4.7 degC Cooler#3 5.1 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.





Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

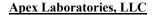
ANALYTICAL REPORT FOR SAMPLES

	SAMPLE INFORMA	ATION		
Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-7	A0F0070-01	Water	06/01/20 09:46	06/02/20 17:16
MW-10	A0F0070-02	Water	06/01/20 10:27	06/02/20 17:16
MW-5	A0F0070-03	Water	06/01/20 11:16	06/02/20 17:16
MW-5D	A0F0070-04	Water	06/01/20 11:49	06/02/20 17:16
MW-8	A0F0070-05	Water	06/01/20 12:42	06/02/20 17:16
MW-8D	A0F0070-06	Water	06/01/20 13:30	06/02/20 17:16
MW-6	A0F0070-07	Water	06/01/20 14:22	06/02/20 17:16
MW-1	A0F0070-08	Water	06/02/20 08:10	06/02/20 17:16
MW-11	A0F0070-09	Water	06/02/20 08:54	06/02/20 17:16
MW-11 DUP	A0F0070-10	Water	06/02/20 08:54	06/02/20 17:16
MW-3	A0F0070-11	Water	06/02/20 09:51	06/02/20 17:16
MW-4	A0F0070-12	Water	06/02/20 10:41	06/02/20 17:16
MW-2	A0F0070-13	Water	06/02/20 13:43	06/02/20 17:16
MW-9	A0F0070-14	Water	06/02/20 14:35	06/02/20 17:16
Trip Blank	A0F0070-15	Water	06/02/20 00:00	06/02/20 17:16

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or Oil	Hydrocar	bons by NWTP	H-Dx			
Accelera	Sample	Detection	Reporting	11	Dilti	Date	M-4b-dD C	N-4
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-7 (A0F0070-01RE1)		!		Matrix: Water		Batch: 0060181		
Diesel	ND		0.0755	mg/L	1	06/05/20 05:11	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 05:11	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 78 %	Limits: 50-150 %	6 1	06/05/20 05:11	NWTPH-Dx LL	
MW-10 (A0F0070-02RE1)				Matrix: Wat	er	Batch	: 0060181	
Diesel	ND		0.0755	mg/L	1	06/05/20 05:33	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 05:33	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 84 %	Limits: 50-150 %	6 1	06/05/20 05:33	NWTPH-Dx LL	
MW-5 (A0F0070-03RE1)				Matrix: Wat	er	Batch	: 0060181	
Diesel	2.04		0.0762	mg/L	1	06/05/20 05:55	NWTPH-Dx LL	F-13, F-19
Oil	0.193		0.152	mg/L	1	06/05/20 05:55	NWTPH-Dx LL	F-16
Surrogate: o-Terphenyl (Surr)		Recover	y: 94 %	Limits: 50-150 %	6 1	06/05/20 05:55	NWTPH-Dx LL	
MW-5D (A0F0070-04RE1)				Matrix: Water		Batch: 0060181		
Diesel	0.0974		0.0762	mg/L	1	06/05/20 06:18	NWTPH-Dx LL	F-11
Oil	ND		0.152	mg/L	1	06/05/20 06:18	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 74 %	Limits: 50-150 %	6 I	06/05/20 06:18	NWTPH-Dx LL	
MW-8 (A0F0070-05RE1)				Matrix: Water		Batch: 0060181		
Diesel	ND		0.0755	mg/L	1	06/05/20 06:40	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 06:40	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 92 %	Limits: 50-150 %	6 1	06/05/20 06:40	NWTPH-Dx LL	
MW-8D (A0F0070-06RE1)				Matrix: Wat	er Batch		: 0060181	
Diesel	ND		0.0755	mg/L	1	06/05/20 07:03	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 07:03	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 80 %	Limits: 50-150 %	6 1	06/05/20 07:03	NWTPH-Dx LL	
MW-6 (A0F0070-07RE1)				Matrix: Water		Batch: 0060181		
Diesel	6.92		0.0748	mg/L	1	06/05/20 07:25	NWTPH-Dx LL	F-13, F-20
Oil	ND		0.150	mg/L	1	06/05/20 07:25	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recover	y: 91 %	Limits: 50-150 %	6 1	06/05/20 07:25	NWTPH-Dx LL	
MW-1 (A0F0070-08RE1)				Matrix: Wat	er	Batch	: 0060181	
Diesel	0.212		0.0755	mg/L	1	06/05/20 07:47	NWTPH-Dx LL	F-11

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

OKELAF ID. OKI

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or Oi	l Hydrocar	bons by NWTP	H-Dx			
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-1 (A0F0070-08RE1)				Matrix: Water		Batch: 0060181		
Oil	ND		0.151	mg/L	1	06/05/20 07:47	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 95%	Limits: 50-150 %	6 1	06/05/20 07:47	NWTPH-Dx LL	
MW-11 (A0F0070-09)				Matrix: Wat	er	Batch	: 0060181	
Diesel	0.129		0.0748	mg/L	1	06/05/20 08:10	NWTPH-Dx LL	F-11, F-20
Oil	ND		0.150	mg/L	1	06/05/20 08:10	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 65 %	Limits: 50-150 %	6 I	06/05/20 08:10	NWTPH-Dx LL	
MW-11 DUP (A0F0070-10)			Matrix		er	Batch	: 0060181	
Diesel	ND		0.0755	mg/L	1	06/05/20 01:50	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 01:50	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 72 %	Limits: 50-150 %	6 1	06/05/20 01:50	NWTPH-Dx LL	
MW-3 (A0F0070-11RE1)				Matrix: Water		Batch: 0060181		
Diesel	ND		0.0762	mg/L	1	06/05/20 02:12	NWTPH-Dx LL	
Oil	ND		0.152	mg/L	1	06/05/20 02:12	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 79 %	Limits: 50-150 %	6 I	06/05/20 02:12	NWTPH-Dx LL	
MW-4 (A0F0070-12RE1)				Matrix: Water		Batch: 0060181		
Diesel	0.0914		0.0762	mg/L	1	06/05/20 02:35	NWTPH-Dx LL	F-11
Oil	ND		0.152	mg/L	1	06/05/20 02:35	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 88 %	Limits: 50-150 %	6 I	06/05/20 02:35	NWTPH-Dx LL	
MW-2 (A0F0070-13RE1)				Matrix: Water		Batch: 0060181		
Diesel	ND		0.0755	mg/L	1	06/05/20 02:57	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 02:57	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 76 %	Limits: 50-150 %	6 1	06/05/20 02:57	NWTPH-Dx LL	
MW-9 (A0F0070-14RE1)				Matrix: Wat	er	Batch	: 0060181	
Diesel	ND		0.0755	mg/L	1	06/05/20 03:19	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	06/05/20 03:19	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 81 %	Limits: 50-150 %	6 I	06/05/20 03:19	NWTPH-Dx LL	

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons (B	enzene tl	rough Naphtha	alene) by	NWTPH-Gx		
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-7 (A0F0070-01)				Matrix: Wate	Matrix: Water		Batch: 0060103	
Gasoline Range Organics	ND		0.100	mg/L	1	06/03/20 19:11	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 101 %	Limits: 50-150 %	5 1	06/03/20 19:11	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	5 1	06/03/20 19:11	NWTPH-Gx (MS)	
MW-10 (A0F0070-02)		M		Matrix: Water		Batch: 0060103		
Gasoline Range Organics	ND		0.100	mg/L	1	06/03/20 19:38	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 99 %	Limits: 50-150 %	5 1	06/03/20 19:38	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	5 1	06/03/20 19:38	NWTPH-Gx (MS)	
MW-5 (A0F0070-03)		Matrix: Water Batch: 006015		: 0060159				
Gasoline Range Organics	12.7		2.00	mg/L	20	06/04/20 12:20	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 101 %	Limits: 50-150 %	5 1	06/04/20 12:20	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			98 %	50-150 %	5 1	06/04/20 12:20	NWTPH-Gx (MS)	
MW-5D (A0F0070-04)		Matrix: Water Batch: 0060103		: 0060103				
Gasoline Range Organics	ND		0.100	mg/L	1	06/03/20 20:05	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 103 %	Limits: 50-150 %	5 1	06/03/20 20:05	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			103 %	50-150 %	5 1	06/03/20 20:05	NWTPH-Gx (MS)	
MW-8 (A0F0070-05)				Matrix: Wate	er	Batch	: 0060159	
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 15:30	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 103 %	Limits: 50-150 %	5 1	06/04/20 15:30	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	5 1	06/04/20 15:30	NWTPH-Gx (MS)	
MW-8D (A0F0070-06)				Matrix: Wate	er	Batch	: 0060159	
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 16:52	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 104 %	Limits: 50-150 %	5 1	06/04/20 16:52	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			104 %	50-150 %	5 1	06/04/20 16:52	NWTPH-Gx (MS)	
MW-6 (A0F0070-07)				Matrix: Water		Batch: 0060159		
Gasoline Range Organics	11.3		1.00	mg/L	10	06/04/20 13:14	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 104 %	Limits: 50-150 %	5 1	06/04/20 13:14	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			96 %	50-150 %	5 1	06/04/20 13:14	NWTPH-Gx (MS)	
MW-1 (A0F0070-08)				Matrix: Wate	er	Batch	: 0060159	
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 17:19	NWTPH-Gx (MS)	

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

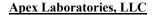
ANALYTICAL SAMPLE RESULTS

Gasol	Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx									
	Sample	Detection	Reporting			Date				
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes		
MW-1 (A0F0070-08)				Matrix: Water		Batch: 0060159				
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 102 %	Limits: 50-150 %	1	06/04/20 17:19	NWTPH-Gx (MS)			
I,4-Difluorobenzene (Sur)			103 %	50-150 %	1	06/04/20 17:19	NWTPH-Gx (MS)			
MW-11 (A0F0070-09)			Matrix: Water		er	Batch: 0060159				
Gasoline Range Organics	1.59		0.250	mg/L	2.5	06/04/20 13:41	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 102 %	Limits: 50-150 %	1	06/04/20 13:41	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			94 %	50-150 %	1	06/04/20 13:41	NWTPH-Gx (MS)			
MW-11 DUP (A0F0070-10)				Matrix: Wate	er	Batch	: 0060159			
Gasoline Range Organics	1.62		0.250	mg/L	2.5	06/04/20 14:09	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 103 %	Limits: 50-150 %	1	06/04/20 14:09	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			93 %	50-150 %	1	06/04/20 14:09	NWTPH-Gx (MS)			
MW-3 (A0F0070-11)				Matrix: Water		Batch: 0060159				
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 17:46	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 104 %	Limits: 50-150 %	1	06/04/20 17:46	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			104 %	50-150 %	1	06/04/20 17:46	NWTPH-Gx (MS)			
MW-4 (A0F0070-12)				Matrix: Wate	er	Batch	: 0060159			
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 18:13	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 105 %	Limits: 50-150 %	1	06/04/20 18:13	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			106 %	50-150 %	1	06/04/20 18:13	NWTPH-Gx (MS)			
MW-2 (A0F0070-13)				Matrix: Wate	er	Batch	: 0060159			
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 18:40	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 104 %	Limits: 50-150 %	1	06/04/20 18:40	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			103 %	50-150 %	1	06/04/20 18:40	NWTPH-Gx (MS)			
MW-9 (A0F0070-14)				Matrix: Wate	er	Batch	: 0060159			
Gasoline Range Organics	ND		0.100	mg/L	1	06/04/20 19:07	NWTPH-Gx (MS)			
Surrogate: 4-Bromofluorobenzene (Sur)		Recovery	: 107 %	Limits: 50-150 %	1	06/04/20 19:07	NWTPH-Gx (MS)			
1,4-Difluorobenzene (Sur)			108 %	50-150 %	1	06/04/20 19:07	NWTPH-Gx (MS)			

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	Sample	Detection	Reporting			Date		
Analyte	Sample Result	Detection Limit	Limit Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
	100011	Ziiiit	2.11111			<u> </u>		110103
MW-7 (A0F0070-01)				Matrix: Wate	Г		0060103	
Benzene	ND		0.200	ug/L	1	06/03/20 19:11	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/03/20 19:11	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/03/20 19:11	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/03/20 19:11	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/03/20 19:11	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/03/20 19:11	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 108 %	Limits: 80-120 %	1	06/03/20 19:11	EPA 8260D	
Toluene-d8 (Surr)			99 %	80-120 %	1	06/03/20 19:11	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	06/03/20 19:11	EPA 8260D	
MW-10 (A0F0070-02)				Matrix: Wate	r	Batch:	0060103	
Benzene	ND		0.200	ug/L	1	06/03/20 19:38	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/03/20 19:38	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/03/20 19:38	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/03/20 19:38	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/03/20 19:38	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/03/20 19:38	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	ry: 110 %	Limits: 80-120 %	1	06/03/20 19:38	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/03/20 19:38	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	06/03/20 19:38	EPA 8260D	
MW-5 (A0F0070-03)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		4.00	ug/L	20	06/04/20 12:20	EPA 8260D	
Ethylbenzene	244		10.0	ug/L	20	06/04/20 12:20	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20	06/04/20 12:20	EPA 8260D	
Naphthalene	1290		40.0	ug/L	20	06/04/20 12:20	EPA 8260D	
Toluene	ND		20.0	ug/L	20	06/04/20 12:20	EPA 8260D	
Xylenes, total	844		30.0	ug/L	20	06/04/20 12:20	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 104 %	Limits: 80-120 %	1	06/04/20 12:20	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/04/20 12:20	EPA 8260D	
4-Bromofluorobenzene (Surr)			98 %	80-120 %	1	06/04/20 12:20	EPA 8260D	
MW-5D (A0F0070-04)				Matrix: Wate	r	Batch:	0060103	
Benzene	ND		0.200	ug/L	1	06/03/20 20:05	EPA 8260D	<u> </u>
Ethylbenzene	ND		0.500	ug/L	1	06/03/20 20:05	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/03/20 20:05	EPA 8260D	
- ` ` ` ` ` ` ` ` ` /	ND		2.00	ug/L		06/03/20 20:05	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	Selec	ted voiatile Org	ariic COII	pounds by EPA	1 020UD			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5D (A0F0070-04)				Matrix: Wate	r	Batch:	0060103	
Toluene	ND		1.00	ug/L	1	06/03/20 20:05	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/03/20 20:05	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery.	108 %	Limits: 80-120 %	1	06/03/20 20:05	EPA 8260D	
Toluene-d8 (Surr)			99 %	80-120 %	1	06/03/20 20:05	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	06/03/20 20:05	EPA 8260D	
MW-8 (A0F0070-05)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 15:30	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 15:30	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 15:30	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 15:30	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 15:30	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 15:30	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery.	109 %	Limits: 80-120 %	1	06/04/20 15:30	EPA 8260D	
Toluene-d8 (Surr)			97 %	80-120 %	1	06/04/20 15:30	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	06/04/20 15:30	EPA 8260D	
MW-8D (A0F0070-06)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 16:52	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 16:52	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 16:52	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 16:52	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 16:52	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 16:52	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery.	109 %	Limits: 80-120 %	1	06/04/20 16:52	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/04/20 16:52	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	06/04/20 16:52	EPA 8260D	
MW-6 (A0F0070-07)				Matrix: Wate	r	Batch:	0060159	
Benzene	163		2.00	ug/L	10	06/04/20 13:14	EPA 8260D	
Ethylbenzene	1740		5.00	ug/L	10	06/04/20 13:14	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	06/04/20 13:14	EPA 8260D	
Naphthalene	433		20.0	ug/L	10	06/04/20 13:14	EPA 8260D	
Toluene	28.6		10.0	ug/L	10	06/04/20 13:14	EPA 8260D	
Xylenes, total	363		15.0	ug/L	10	06/04/20 13:14	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery.	103 %	Limits: 80-120 %	1	06/04/20 13:14	EPA 8260D	
Toluene-d8 (Surr)			97 %	80-120 %	1	06/04/20 13:14	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

<u> </u>				npounds by EPA				
Amaluta	Sample	Detection	Reporting	I I:4-	Dibution	Date	Mother J.Df	NT_4
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-6 (A0F0070-07)				Matrix: Water	r	Batch:	0060159	
Surrogate: 4-Bromofluorobenzene (Surr)		Recovery	: 100 %	Limits: 80-120 %	1	06/04/20 13:14	EPA 8260D	
MW-1 (A0F0070-08)				Matrix: Water	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 17:19	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 17:19	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 17:19	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 17:19	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 17:19	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 17:19	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 110 %	Limits: 80-120 %	1	06/04/20 17:19	EPA 8260D	
Toluene-d8 (Surr)			97 %	80-120 %	1	06/04/20 17:19	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	06/04/20 17:19	EPA 8260D	
MW-11 (A0F0070-09)				Matrix: Water	r	Batch:	0060159	
Benzene	23.2		0.500	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Ethylbenzene	352		1.25	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		2.50	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Naphthalene	22.5		5.00	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Toluene	ND		2.50	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Xylenes, total	81.2		3.75	ug/L	2.5	06/04/20 13:41	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 99 %	Limits: 80-120 %	1	06/04/20 13:41	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/04/20 13:41	EPA 8260D	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	06/04/20 13:41	EPA 8260D	
MW-11 DUP (A0F0070-10)				Matrix: Water	r	Batch:	0060159	
Benzene	22.0		0.500	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Ethylbenzene	353		1.25	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		2.50	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Naphthalene	22.0		5.00	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Toluene	ND		2.50	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Xylenes, total	83.0		3.75	ug/L	2.5	06/04/20 14:09	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 100 %	Limits: 80-120 %	1	06/04/20 14:09	EPA 8260D	
Toluene-d8 (Surr)			97 %	80-120 %	1	06/04/20 14:09	EPA 8260D	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	1	06/04/20 14:09	EPA 8260D	
MW-3 (A0F0070-11)				Matrix: Water	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 17:46	EPA 8260D	
				2				

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	36160	ted voiatile Org	ariic Coll	pounds by EPA	0200D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-3 (A0F0070-11)				Matrix: Wate	r	Batch:	0060159	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 17:46	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 17:46	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 17:46	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 17:46	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 17:46	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 110 %	Limits: 80-120 %	1	06/04/20 17:46	EPA 8260D	
Toluene-d8 (Surr)			99 %	80-120 %	1	06/04/20 17:46	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	06/04/20 17:46	EPA 8260D	
MW-4 (A0F0070-12)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 18:13	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 18:13	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 18:13	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 18:13	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 18:13	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 18:13	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 110 %	Limits: 80-120 %	1	06/04/20 18:13	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/04/20 18:13	EPA 8260D	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	06/04/20 18:13	EPA 8260D	
MW-2 (A0F0070-13)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 18:40	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 18:40	EPA 8260D	
Methyl tert-butyl ether (MTBE)	7.74		1.00	ug/L	1	06/04/20 18:40	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 18:40	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 18:40	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 18:40	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 110 %	Limits: 80-120 %	1	06/04/20 18:40	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	06/04/20 18:40	EPA 8260D	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	06/04/20 18:40	EPA 8260D	
MW-9 (A0F0070-14)				Matrix: Wate	r	Batch:	0060159	
Benzene	ND		0.200	ug/L	1	06/04/20 19:07	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	06/04/20 19:07	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	06/04/20 19:07	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	06/04/20 19:07	EPA 8260D	
Toluene	ND		1.00	ug/L	1	06/04/20 19:07	EPA 8260D	

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Avad Jomenyhini



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u>
5820 SW Kelly Ave Unit B
Portland, OR 97239

Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

ANALYTICAL SAMPLE RESULTS

	Select	ed Volatile Or	ganic Com	pounds by EP	A 8260D			
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-9 (A0F0070-14)				Matrix: Wate	er	Batch:	0060159	
Xylenes, total	ND		1.50	ug/L	1	06/04/20 19:07	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	y: 111 %	Limits: 80-120 %	6 I	06/04/20 19:07	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	6 I	06/04/20 19:07	EPA 8260D	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	6 1	06/04/20 19:07	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbon	s by NW1	ΓPH-Dx						
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Note	es
Batch 0060128 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0060128-BLK1)		Prepared	: 06/03/20 11:	21 Analyz	ed: 06/03/20	22:30							
NWTPH-Dx LL													
Diesel	ND		0.0727	mg/L	1							Q-30	
Oil	ND		0.145	mg/L	1							Q-30	
Surr: o-Terphenyl (Surr)		Rec	overy: 90 %	Limits: 50	-150 %	Dilı	ution: 1x						
LCS (0060128-BS1)		Prepared	: 06/03/20 11:	21 Analyz	ed: 06/03/20	22:53							
NWTPH-Dx LL													
Diesel	0.182		0.0800	mg/L	1	0.500		36 5	59 - 115%			Q-30	
Surr: o-Terphenyl (Surr)		Rec	overy: 45 %	Limits: 50	-150 %	Dilı	ution: 1x					S-06	
LCS Dup (0060128-BSD1)		Prepared	: 06/03/20 11:	21 Analyz	ed: 06/03/20	23:15							Q-1
NWTPH-Dx LL													
Diesel	0.418		0.0800	mg/L	1	0.500		84	59 - 115%	78	30%	Q-01	
Surr: o-Terphenyl (Surr)		Rec	overy: 96 %	Limits: 50	-150 %	Dilı	ution: 1x						
Batch 0060181 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0060181-BLK1)		Prepared	: 06/04/20 11::	59 Analyz	ed: 06/04/20	23:13							
NWTPH-Dx LL													
Diesel	ND		0.0727	mg/L	1								
Oil	ND		0.145	mg/L	1								
Surr: o-Terphenyl (Surr)		Rec	overy: 85 %	Limits: 50	-150 %	Dilt	ution: 1x						
LCS (0060181-BS1)		Prepared	: 06/04/20 11::	59 Analyz	ed: 06/04/20	23:35							
NWTPH-Dx LL				mg/L	1	0.500		80	59 - 115%				
	0.399		0.0800	mg/L	_								
NWTPH-Dx LL	0.399	Reco	0.0800 overy: 87 %	Limits: 50		Dilı	ution: 1x						_
NWTPH-Dx LL Diesel	0.399			Limits: 50	-150 %		ution: 1x						 Q-1
NWTPH-Dx LL Diesel Surr: o-Terphenyl (Surr)	0.399		overy: 87 %	Limits: 50	-150 %		ution: Ix						
NWTPH-Dx LL Diesel Surr: o-Terphenyl (Surr) LCS Dup (0060181-BSD1)	0.399		overy: 87 %	Limits: 50	-150 %		ution: 1x	78	59 - 115%	2	30%		Q-19

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolii	ne Range H	lydrocarbo	ons (Ben	zene thro	ugh Naph	thalene)	by NWTP	H-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060103 - EPA 5030B							Wat	er				
Blank (0060103-BLK1)		Prepared	06/03/20 07:	30 Analyz	zed: 06/03/2	0 09:13						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 105 %	Limits: 5	0-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			109 %	50	0-150 %		"					
LCS (0060103-BS2)		Prepared	: 06/03/20 07:	:30 Analyz	zed: 06/03/2	0 08:46						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.449		0.100	mg/L	1	0.500		90	80 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 102 %	Limits: 5	0-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			99 %	50	0-150 %		"					
Duplicate (0060103-DUP2)		Prepared	: 06/03/20 15:	:00 Analyz	zed: 06/03/2	0 20:32						T-02
QC Source Sample: MW-5D (A0I	F0070-04)											
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1		ND				30%	
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 103 %	Limits: 5	0-150 %	Dilı	ution: 1x				<u> </u>	
1,4-Difluorobenzene (Sur)			104 %	50	0-150 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolir	ne Range I	lydrocarbo	ns (Benz	ene thro	ugh Naph	thalene) l	by NWTP	H-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060159 - EPA 5030B							Wat	er				
Blank (0060159-BLK1)		Prepared	: 06/04/20 07:	30 Analyz	ed: 06/04/2	0 09:37						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Reco	very: 103 %	Limits: 50	0-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			104 %	50	-150 %		"					
LCS (0060159-BS2)		Prepared	: 06/04/20 07:	30 Analyz	ed: 06/04/2	0 09:10						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.445		0.100	mg/L	1	0.500		89 8	30 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Rec	overy: 99 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
1,4-Difluorobenzene (Sur)			97 %	50	-150 %		"					
Duplicate (0060159-DUP1)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/2	0 12:47						
QC Source Sample: MW-5 (A0F0	0070-03)											
NWTPH-Gx (MS)												
Gasoline Range Organics	12.8		2.00	mg/L	20		12.7			0.5	30%	
Surr: 4-Bromofluorobenzene (Sur)		Reco	very: 101 %	Limits: 50	0-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			99 %	50	-150 %		"					
Duplicate (0060159-DUP2)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/2	0 19:34						
QC Source Sample: MW-9 (A0F0	0070-14)											
NWTPH-Gx (MS)			0.100	_								
Gasoline Range Organics	ND		0.100	mg/L			ND				30%	
Surr: 4-Bromofluorobenzene (Sur)		Reco	very: 106 %	Limits: 50		Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			106 %	50	-150 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

		3616	cted Volatil	e Organi	Compo	unus by E	_i-A 02001					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060103 - EPA 5030B							Wat	er				
Blank (0060103-BLK1)		Prepared	: 06/03/20 07:	30 Analyz	zed: 06/03/2	0 09:13						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
Toluene	ND		1.00	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 113 %	Limits: 80	0-120 %	Dilt	ution: 1x					
Toluene-d8 (Surr)			99 %	80)-120 %		"					
4-Bromofluorobenzene (Surr)			103 %	80	0-120 %		"					
LCS (0060103-BS1)		Prepared	: 06/03/20 07:	30 Analyz	zed: 06/03/2	0 08:19						
EPA 8260D				<u>·</u>								
Benzene	20.3		0.200	ug/L	1	20.0		102	80 - 120%			
Ethylbenzene	20.1		0.500	ug/L	1	20.0		101	80 - 120%			
Methyl tert-butyl ether (MTBE)	21.6		1.00	ug/L	1	20.0		108	80 - 120%			
Naphthalene	17.1		2.00	ug/L	1	20.0		86	80 - 120%			
Toluene	18.9		1.00	ug/L	1	20.0		94	80 - 120%			
Xylenes, total	57.0		1.50	ug/L	1	60.0		95	80 - 120%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 102 %	Limits: 80	0-120 %	Dilt	ution: 1x					
Toluene-d8 (Surr)			96 %	80	0-120 %		"					
4-Bromofluorobenzene (Surr)			95 %	80	0-120 %		"					
Duplicate (0060103-DUP2)		Prepared	: 06/03/20 15:	00 Analyz	ed: 06/03/2	0 20:32						Т
QC Source Sample: MW-5D (A01	<u> 70070-04)</u>											
EPA 8260D	3.775		0.200	r=							2027	
Benzene	ND		0.200	ug/L	1		ND				30%	
Ethylbenzene	ND		0.500	ug/L	1		ND				30%	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1		ND				30%	
Naphthalene	ND		2.00	ug/L	1		ND				30%	
Toluene	ND		1.00	ug/L	1		ND				30%	
Xylenes, total	ND		1.50	ug/L	1		ND				30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco	•	Limits: 80		Dili	ution: 1x					
Toluene-d8 (Surr)			99 %	80)-120 %		"					

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Asa & Jomenyhini



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia Associates
5820 SW Kelly Ave Unit B
Portland, OR 97239

Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organ	ic Compo	unds by E	PA 8260	D				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060103 - EPA 5030B							Wat	er				
Duplicate (0060103-DUP2)		Prepared	: 06/03/20 15:	00 Analy	zed: 06/03/2	0 20:32						T-02
QC Source Sample: MW-5D (A01	F0070-04)											
Surr: 4-Bromofluorobenzene (Surr)		Reco	very: 102 %	Limits: 8	80-120 %	Dil	ution: 1x					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239

F

Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 8260I	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060159 - EPA 5030B							Wat	er				
Blank (0060159-BLK1)		Prepared	: 06/04/20 07:	30 Analyz	ed: 06/04/20	0 09:37						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
Toluene	ND		1.00	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 110 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			98 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			102 %	80	-120 %		"					
LCS (0060159-BS1)		Prepared	: 06/04/20 07:	30 Analyz	ed: 06/04/20	0 08:43				_		
EPA 8260D												
Benzene	20.7		0.200	ug/L	1	20.0		103	80 - 120%			
Ethylbenzene	20.4		0.500	ug/L	1	20.0		102	80 - 120%			
Methyl tert-butyl ether (MTBE)	22.8		1.00	ug/L	1	20.0		114	80 - 120%			
Naphthalene	18.5		2.00	ug/L	1	20.0		93	80 - 120%			
Toluene	19.2		1.00	ug/L	1	20.0		96	80 - 120%			
Xylenes, total	58.0		1.50	ug/L	1	60.0		97	80 - 120%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 102 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			95 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			95 %	80	-120 %		"					
Duplicate (0060159-DUP1)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/20	0 12:47						
OC Source Sample: MW-5 (A0F0) EPA 8260D	070-03)											
Benzene	ND		4.00	ug/L	20		ND				30%	
Ethylbenzene	246		10.0	ug/L	20		244			0.9	30%	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20		ND				30%	
Naphthalene	1250		40.0	ug/L	20		1290			3	30%	
Toluene	ND		20.0	ug/L	20		ND				30%	
Xylenes, total	851		30.0	ug/L	20		844			0.8	30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco			0-120 %	Dilı	ıtion: 1x					
Toluene-d8 (Surr)		7,000	97 %		-120 %	Dill	uton. 1x					

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Assa & Jamenyhini





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<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 8260	D				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0060159 - EPA 5030B							Wat	er				
Duplicate (0060159-DUP1)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/2	0 12:47						
QC Source Sample: MW-5 (A0F0	070-03)											
Surr: 4-Bromofluorobenzene (Surr)		Rec	overy: 98 %	Limits: 80	1-120 %	Dilı	ution: 1x					
Duplicate (0060159-DUP2)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/2	0 19:34						
OC Source Sample: MW-9 (A0F0 EPA 8260D	<u>070-14)</u>											
Benzene	ND		0.200	ug/L	1		ND				30%	
Ethylbenzene	ND		0.500	ug/L	1		ND				30%	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1		ND				30%	
Naphthalene	ND		2.00	ug/L	1		ND				30%	
Toluene	ND		1.00	ug/L	1		ND				30%	
Xylenes, total	ND		1.50	ug/L	1		ND				30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 113 %	Limits: 80	-120 %	Dilı	ıtion: 1x					
Toluene-d8 (Surr)			98 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			103 %	80	-120 %		"					
Matrix Spike (0060159-MS1)		Prepared	: 06/04/20 09:	37 Analyz	ed: 06/04/2	0 15:57						
QC Source Sample: MW-8 (A0F0	070-05)											
EPA 8260D												
Benzene	22.5		0.200	ug/L	1	20.0	ND		79 - 120%			
Ethylbenzene	22.6		0.500	ug/L	1	20.0	ND		79 - 121%			
Methyl tert-butyl ether (MTBE)	24.2		1.00	ug/L	1	20.0	ND		1 - 124%			
Naphthalene	20.2		2.00	ug/L	1	20.0	ND		61 - 128%			
Toluene	20.9		1.00	ug/L	1	20.0	ND		80 - 121%			
Xylenes, total	64.3		1.50	ug/L	1	60.0	ND	107	79 - 121%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 100 %	Limits: 80		Dilı	ution: 1x					
Toluene-d8 (Surr)			95 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			94 %	80	-120 %		"					

Apex Laboratories

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

SAMPLE PREPARATION INFORMATION

-		Diesel and	Diesel and/or Oil Hydrocarbons by NWTPH-Dx													
Prep: EPA 3510C (Fuels/Acid Ext.)				Sample	Default	RL Prep									
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor									
Batch: 0060181																
A0F0070-01RE1	Water	NWTPH-Dx LL	06/01/20 09:46	06/04/20 13:00	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-02RE1	Water	NWTPH-Dx LL	06/01/20 10:27	06/04/20 13:00	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-03RE1	Water	NWTPH-Dx LL	06/01/20 11:16	06/04/20 13:00	1050mL/2mL	1000mL/2mL	0.95									
A0F0070-04RE1	Water	NWTPH-Dx LL	06/01/20 11:49	06/04/20 13:00	1050mL/2mL	1000mL/2mL	0.95									
A0F0070-05RE1	Water	NWTPH-Dx LL	06/01/20 12:42	06/04/20 13:00	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-06RE1	Water	NWTPH-Dx LL	06/01/20 13:30	06/04/20 13:00	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-07RE1	Water	NWTPH-Dx LL	06/01/20 14:22	06/04/20 13:00	1070mL/2mL	1000mL/2mL	0.94									
A0F0070-08RE1	Water	NWTPH-Dx LL	06/02/20 08:10	06/04/20 13:00	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-09	Water	NWTPH-Dx LL	06/02/20 08:54	06/04/20 13:00	1070mL/2mL	1000mL/2mL	0.94									
A0F0070-10	Water	NWTPH-Dx LL	06/02/20 08:54	06/04/20 11:59	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-11RE1	Water	NWTPH-Dx LL	06/02/20 09:51	06/04/20 11:59	1050mL/2mL	1000mL/2mL	0.95									
A0F0070-12RE1	Water	NWTPH-Dx LL	06/02/20 10:41	06/04/20 11:59	1050mL/2mL	1000mL/2mL	0.95									
A0F0070-13RE1	Water	NWTPH-Dx LL	06/02/20 13:43	06/04/20 11:59	1060mL/2mL	1000mL/2mL	0.94									
A0F0070-14RE1	Water	NWTPH-Dx LL	06/02/20 14:35	06/04/20 11:59	1060mL/2mL	1000mL/2mL	0.94									

	Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx														
Prep: EPA 5030B					Sample	Default	RL Prep								
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor								
Batch: 0060103															
A0F0070-01	Water	NWTPH-Gx (MS)	06/01/20 09:46	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
A0F0070-02	Water	NWTPH-Gx (MS)	06/01/20 10:27	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
A0F0070-04	Water	NWTPH-Gx (MS)	06/01/20 11:49	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
Batch: 0060159															
A0F0070-03	Water	NWTPH-Gx (MS)	06/01/20 11:16	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-05	Water	NWTPH-Gx (MS)	06/01/20 12:42	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-06	Water	NWTPH-Gx (MS)	06/01/20 13:30	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-07	Water	NWTPH-Gx (MS)	06/01/20 14:22	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-08	Water	NWTPH-Gx (MS)	06/02/20 08:10	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-09	Water	NWTPH-Gx (MS)	06/02/20 08:54	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-10	Water	NWTPH-Gx (MS)	06/02/20 08:54	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-11	Water	NWTPH-Gx (MS)	06/02/20 09:51	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-12	Water	NWTPH-Gx (MS)	06/02/20 10:41	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-13	Water	NWTPH-Gx (MS)	06/02/20 13:43	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-14	Water	NWTPH-Gx (MS)	06/02/20 14:35	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

SAMPLE PREPARATION INFORMATION

	Selected Volatile Organic Compounds by EPA 8260D														
Prep: EPA 5030B					Sample	Default	RL Prep								
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor								
Batch: 0060103															
A0F0070-01	Water	EPA 8260D	06/01/20 09:46	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
A0F0070-02	Water	EPA 8260D	06/01/20 10:27	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
A0F0070-04	Water	EPA 8260D	06/01/20 11:49	06/03/20 15:00	5mL/5mL	5mL/5mL	1.00								
Batch: 0060159															
A0F0070-03	Water	EPA 8260D	06/01/20 11:16	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-05	Water	EPA 8260D	06/01/20 12:42	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-06	Water	EPA 8260D	06/01/20 13:30	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-07	Water	EPA 8260D	06/01/20 14:22	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-08	Water	EPA 8260D	06/02/20 08:10	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-09	Water	EPA 8260D	06/02/20 08:54	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-10	Water	EPA 8260D	06/02/20 08:54	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-11	Water	EPA 8260D	06/02/20 09:51	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-12	Water	EPA 8260D	06/02/20 10:41	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-13	Water	EPA 8260D	06/02/20 13:43	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								
A0F0070-14	Water	EPA 8260D	06/02/20 14:35	06/04/20 09:37	5mL/5mL	5mL/5mL	1.00								

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Report ID:Portland, OR 97239Project Manager:Stephanie SalisburyA0F0070 - 06 08 20 1024

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

F-11	The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
F-13	The chromatographic pattern does not resemble the fuel standard used for quantitation
F-16	Results for oil are estimated due to overlap from the reported diesel result.
F-19	Results are Estimated due to the presence of multiple fuel products.
F-20	Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
Q-30	Recovery for Lab Control Spike (LCS) is below the lower control limit. Data may be biased low.
S-06	Surrogate recovery is outside of established control limits.
T-02	This Batch QC sample was analyzed outside of the method specified 12 hour tune window. Results are estimated.

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ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Report ID:Portland, OR 97239Project Manager:Stephanie SalisburyA0F0070 - 06 08 20 1024

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")

See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

"___" Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

"---" QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

- -For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
- -For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Report ID:Portland, OR 97239Project Manager:Stephanie SalisburyA0F0070 - 06 08 20 1024

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Report ID:

Cascadia Associates Project: **Nustar Vannex** 5820 SW Kelly Ave Unit B Project Number: 0060-001-001 Portland, OR 97239 Project Manager: Stephanie Salisbury A0F0070 - 06 08 20 1024

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) **EPA ID: OR01039**

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix TNI_ID TNI_ID Accreditation Analysis Analyte

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

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Lab # PDF0070	Project #:	Phone (502) 706-65 TATEMIN 3050 LINUTY C CONCOUNTS SECIETES, con	4	+		TCLP MA	-									*	1 1	+ Some list as Januar 3/4/20 report	The property of CIA OLEO		RECEIVED BY: Signature:	Printed Name:	Сотрану:	
Lab # B	JM 2920 P	aproportal	OUEST	5, Cd, Ca, b, Hg, Mg, Ag, Na, Tl, TCLP	188, Bd Fe, P K, Se K, Se	Al, Sb, As, Cr, Co, Cu, Mn, Mo, Mi, V, Zn FOTAL D												ANNEX 3	6 , 1	econol		. Time: P		
	Project Name: Nu Story Varmer GLVM 2920	<u> जै</u> र्गरामा	ANALYSIS REQUEST		etals (8081 Pest RCRA M Priority N											CTIONS:	D so to	No separate	No Silica Gal electry	e e			
700	e NaStan	19050t		s	HVd	8770 Sem 8270 Sem											SPECIAL INSTRUCTIONS:	Soume !	2	No Silic	RELINQUISHED BY: Signature:	Printed Name:	Company:	
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ırd, OR 97223	Sseciate	Lelly P	TAKE TO SERVICE TO SER		***************************************	# CVB ID #											dormal Turn Aro.	1 Day	cle) 4 DAY	SAMPLES A	Date:			222.
APEX LABS 6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323	Company: Castalia Associa fet Project Mgr Styp house	Address: DOWC :Standard	Sampled by: 7, Clerk	Site Location: OR WA CA	AK ID	SAMPLE ID	4-MM	MW- (0	MW-5	MW-SD	MW-8	MW- BD	9-M	MLJ- 1	MW-11	Dul	Z		I A i Kequested (circle)		RELINQUISHED BY: Signature: (A A)	Printed Manne:	Company	

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0F0070 - 06 08 20 1024

coc 1 of 1	2		Агсійче						port	;		Date:	Time:		
Lab# 40F0070 coc	12 Sell Straig Project Name: Na Stew VerMax GLW 180 Project #:		TCLP Metals (8)	Ž Ž	-		<u> </u>		SPECIAL INSTRUCTIONS:	+ MTBE, Nophhalen by EPA 8260		RECEIVED BY: Signature:	Printed Name:	Company:	
Lab # Aft	Jennex GUMICAL	ANALYSIS REQUEST	MCRA Metals (8) Priority Metals (13) Al, Sb, As, Ba, Be, Cd, Ca, Cr, Ce, Ce, Fe, Pr, Hg, Mg, Nh, Mo, Se, Ag, Na, Ti, Tollor (13) Tollor (1						SNONS:	Sophhalens b	No Silica Gel cleanup	Date:	, Time:		
USTODY	Project Name: N. S. Lew VENNEX GLWAREPROJECT #.	AN	8081 best 8087 bCBs 8230 Scmi-Nois Buil Tist 8230 SIM bYHs 8260 AOCs Buil Tist 8260 Haio AOCs						SPECIAL INSTRUCTION	+ PATOR, ~	IN Silica	0	Printed Name:	Company:	
CHAIN OF CUSTODY	Phone: (473) 1800-6		8700 BBDW AGC? 8700 BLEX; AMALBH-CX AMALBH-HC.ID	11/1					ays			Date: 7/2/2	Time: 17 /6		
	1/8 Portion		# OF COUTAINERS MATRIX TIME	1 951 GW 5	, Ind.	13-13	1 4 5671		10 B	2 Day 3 Day	- 1	Signature:	Printed Name	Company:	,
APEX LABS 6700 SW Sandburg St. Tigard, OR 97223 Ph. 503-718-2323	Clostopp.	2	EVB ID#	(0)			*		Normal Turn Around T	l Day (circle)	SAMPLES ARE HELD FOR 30 DAYS	Z Date: P	OF Profes)clates	
APEX LABS 6700 SW Sandburg St. Tig	Company: Coscochia Asso	Stanfed by: J. We	Site Location: OR (WA) CA AK ID SAMPLE ID	MW-3	MM-4	MW-2	MW - 9			TAT Requested (circle)		RELINQUISHED BY	Printed Name: Sealhwyfry	Company: Castadia Associates	

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Goas Smerighini



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Nustar Vannex</u>

 5820 SW Kelly Ave Unit B
 Project Number: 0060-001-001
 Report ID:

 Portland, OR 97239
 Project Manager: Stephanie Salisbury
 A0F0070 - 06 08 20 1024

	APEX LABS COOLER RECEIPT FORM
•	Client: Cas Cadia Associates Element WO#: A0F0010
ľ	Project/Project #: Nu Star Vannex
Ĭ	Delivery Info:
I	Date/time received: 4/2/20 @ / 1/6 By:
I	Delivered by: ApexClient_X_ESSFedExUPSSwift_Senvoy_SDSOther
(Cooler Inspection Date/time inspected: 1/2/20 @ 17/1e By:
(Chain of Custody included? Yes No Custody seals? Yes No
S	Signed/dated by client? Yes X No
S	Signed/dated by Apex? Yes No
	Cooler #1 Cooler #2 Cooler #3 Cooler #4 Cooler #5 Cooler #6 Cooler #
]	Temperature (°C) 4.9 4.1 5.1
E	Received on ice? (Y/N) U U U
]	Temp. blanks? (Y/N) N N
I	Ice type: (Gel/Real/Other) Veal Veal Veal
(Condition: Good good good
(Cooler out of temp? (Y(N)) Possible reason why: If some coolers are in temp and some out, were green dots applied to out of temperature samples? Yes/No/NA Out of temperature samples form initiated? Yes/No/NA Samples Inspection: Date/time inspected: (0-2-70 @ 18: A By: TAP) All samples intact? Yes No Comments:
£	All samples intact? Yes P No Comments:
	Bottle labels/COCs agree? Yes No X Comments: TB provided not
t	
,	
	COC/container discrepancies form initiated? Yes No No Comments:
•	Comments:
ī	Do VOA vials have visible headspace? Yes No NA
	Comments
	Water samples: pH checked: Yes No NA pH appropriate? Yes No NA
	Comments:
`	Sommens, and the Company of the Comp
	Additional information: TB# 2310
z	Additional miormation.
_	

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Assa & Zmenighini



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Thursday, September 3, 2020 Stephanie Salisbury Cascadia Associates 5820 SW Kelly Ave Unit B Portland, OR 97239

RE: A0H0521 - Shore Terminal-Vancouver Annex - GWM 3Q20

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A0H0521, which was received by the laboratory on 8/19/2020 at 3:07:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample reciept, unless prior arrangements have been made.

Cooler	Receipt	Information	

(See Cooler Receipt Form for details)

 Cooler #1
 5.6 degC
 Cooler #2
 3.6 degC

 Cooler #3
 0.1 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.





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Awa & Jamenyhini





ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

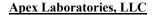
5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL REPORT FOR SAMPLES

	SAMPLE INFORM	ATION		
Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-5	А0Н0521-01	Water	08/17/20 09:57	08/19/20 15:07
MW-5 Dup	А0Н0521-02	Water	08/17/20 09:57	08/19/20 15:07
MW-5D	А0Н0521-03	Water	08/17/20 10:36	08/19/20 15:07
MW-8	А0Н0521-04	Water	08/17/20 11:14	08/19/20 15:07
MW-8D	А0Н0521-05	Water	08/17/20 11:51	08/19/20 15:07
MW-7	А0Н0521-06	Water	08/17/20 12:28	08/19/20 15:07
MW-9	А0Н0521-07	Water	08/17/20 13:34	08/19/20 15:07
MW-6	А0Н0521-08	Water	08/17/20 14:27	08/19/20 15:07
MW-3	А0Н0521-09	Water	08/18/20 08:00	08/19/20 15:07
MW-4	А0Н0521-10	Water	08/18/20 09:09	08/19/20 15:07
MW-2	А0Н0521-11	Water	08/18/20 10:51	08/19/20 15:07
MW-1	А0Н0521-12	Water	08/19/20 08:27	08/19/20 15:07
MW-11	А0Н0521-13	Water	08/19/20 09:02	08/19/20 15:07
MW-11 Dup	А0Н0521-14	Water	08/19/20 09:02	08/19/20 15:07
MW-10	А0Н0521-15	Water	08/19/20 11:40	08/19/20 15:07

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ORELAP ID: OR100062

Report ID:

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury A0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or O	il Hydrocar	bons by NWTP	H-Dx			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5 (A0H0521-01RE1)				Matrix: Wat	er	Batch:	0080922	
Diesel	2.17		0.189	mg/L	1	09/01/20 01:08	NWTPH-Dx	F-18
Oil	ND		0.377	mg/L	1	09/01/20 01:08	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 103 %	Limits: 50-150 %	6 1	09/01/20 01:08	NWTPH-Dx	
MW-5 Dup (A0H0521-02RE1)				Matrix: Wat	er	0080922		
Diesel	2.10		0.189	mg/L	1	09/01/20 01:30	NWTPH-Dx	F-18
Oil	ND		0.377	mg/L	1	09/01/20 01:30	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 101 %	Limits: 50-150 %	% 1	09/01/20 01:30	NWTPH-Dx	
MW-5D (A0H0521-03RE1)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.187	mg/L	1	09/01/20 01:53	NWTPH-Dx	
Oil	ND		0.374	mg/L	1	09/01/20 01:53	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 104%	Limits: 50-150 %	% I	09/01/20 01:53	NWTPH-Dx	
MW-8 (A0H0521-04)				Matrix: Wat	er	Batch:		
Diesel	ND		0.187	mg/L	1	08/25/20 23:43	NWTPH-Dx	
Oil	ND		0.374	mg/L	1	08/25/20 23:43	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Reco	very: 97 %	Limits: 50-150 %	% 1	08/25/20 23:43	NWTPH-Dx	
MW-8D (A0H0521-05RE1)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.189	mg/L	1	09/01/20 02:16	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 02:16	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 109 %	Limits: 50-150 %	% I	09/01/20 02:16	NWTPH-Dx	
MW-7 (A0H0521-06)				Matrix: Wat	er	Batch:	0080739	
Diesel	ND		0.187	mg/L	1	08/26/20 00:28	NWTPH-Dx	
Oil	ND		0.374	mg/L	1	08/26/20 00:28	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 102 %	Limits: 50-150 %	% I	08/26/20 00:28	NWTPH-Dx	
MW-9 (A0H0521-07RE1)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.189	mg/L	1	09/01/20 02:39	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 02:39	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 103 %	Limits: 50-150 %	% I	09/01/20 02:39	NWTPH-Dx	
MW-6 (A0H0521-08)				Matrix: Wat	er	Batch:	0080793	
Diesel	2.66		0.189	mg/L	1	08/27/20 00:59	NWTPH-Dx	F-20

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury

Report ID: A0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or O	il Hydrocar	bons by NWTP	H-Dx			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-6 (A0H0521-08)				Matrix: Wat	er	Batch:	0080793	
Oil	ND		0.377	mg/L	1	08/27/20 00:59	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 103 %	Limits: 50-150 %	6 1	08/27/20 00:59	NWTPH-Dx	
MW-3 (A0H0521-09)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.189	mg/L	1	09/01/20 03:02	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 03:02	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 108 %	Limits: 50-150 %	6 1	09/01/20 03:02	NWTPH-Dx	
MW-4 (A0H0521-10)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.189	mg/L	1	09/01/20 03:24	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 03:24	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 106 %	Limits: 50-150 %	6 I	09/01/20 03:24	NWTPH-Dx	
MW-2 (A0H0521-11)	Matrix: Water Batch: 0080922					0080922		
Diesel	ND		0.189	mg/L	1	09/01/20 03:47	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 03:47	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	very: 112 %	Limits: 50-150 %	6 I	09/01/20 03:47	NWTPH-Dx	
MW-1 (A0H0521-12)				Matrix: Wat	er	Batch:		
Diesel	ND		0.189	mg/L	1	09/01/20 05:41	NWTPH-Dx	
Oil	ND		0.377	mg/L	1	09/01/20 05:41	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 109 %	Limits: 50-150 %	6 1	09/01/20 05:41	NWTPH-Dx	
MW-11 (A0H0521-13)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.187	mg/L	1	09/01/20 06:04	NWTPH-Dx	
Oil	ND		0.374	mg/L	1	09/01/20 06:04	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	very: 110 %	Limits: 50-150 9	6 1	09/01/20 06:04	NWTPH-Dx	
MW-11 Dup (A0H0521-14)				Matrix: Wat	er	Batch:	0080922	
Diesel	0.230		0.189	mg/L	1	09/01/20 06:27	NWTPH-Dx	F-18
Oil	ND		0.377	mg/L	1	09/01/20 06:27	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		Recov	very: 113 %	Limits: 50-150 %	6 1	09/01/20 06:27	NWTPH-Dx	
MW-10 (A0H0521-15)				Matrix: Wat	er	Batch:	0080922	
Diesel	ND		0.187	mg/L	1	09/01/20 06:50	NWTPH-Dx	
Oil	ND		0.374	mg/L	1	09/01/20 06:50	NWTPH-Dx	

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx												
	Sample	Detection	Reporting			Date						
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes				
MW-10 (A0H0521-15)				Matrix: Wa	ater	Batch:	0080922					
Surrogate: o-Terphenyl (Surr)		Recov	ery: 104%	Limits: 50-150	% 1	09/01/20 06:50	NWTPH-Dx					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons (Benzene th	rough Naphtha	alene) by	NWTPH-Gx		
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-5 (A0H0521-01)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	18.8		1.00	mg/L	10	08/20/20 14:22	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 100 %	Limits: 50-150 %	5 1	08/20/20 14:22	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			98 %	50-150 %	5 I	08/20/20 14:22	NWTPH-Gx (MS)	
MW-5 Dup (A0H0521-02)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	22.6		1.00	mg/L	10	08/20/20 15:16	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 97%	Limits: 50-150 %	5 1	08/20/20 15:16	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			98 %	50-150 %	5 1	08/20/20 15:16	NWTPH-Gx (MS)	
MW-5D (A0H0521-03)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 17:06	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 93 %	Limits: 50-150 %	5 1	08/20/20 17:06	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			98 %	50-150 %	5 1	08/20/20 17:06	NWTPH-Gx (MS)	
MW-8 (A0H0521-04)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 17:33	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 92 %	Limits: 50-150 %	5 1	08/20/20 17:33	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			99 %	50-150 %	5 1	08/20/20 17:33	NWTPH-Gx (MS)	
MW-8D (A0H0521-05)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 18:01	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 92 %	Limits: 50-150 %	5 1	08/20/20 18:01	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			99 %	50-150 %	5 1	08/20/20 18:01	NWTPH-Gx (MS)	
MW-7 (A0H0521-06)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 18:28	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 97%	Limits: 50-150 %	5 1	08/20/20 18:28	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	5 1	08/20/20 18:28	NWTPH-Gx (MS)	
MW-9 (A0H0521-07)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 18:55	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 95 %	Limits: 50-150 %	5 1	08/20/20 18:55	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			96 %	50-150 %	5 1	08/20/20 18:55	NWTPH-Gx (MS)	
MW-6 (A0H0521-08)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	14.9		1.00	mg/L	10	08/20/20 19:22	NWTPH-Gx (MS)	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	ydrocarbons (Benzene tl	hrough Naphtha	alene) by	NWTPH-Gx		
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-6 (A0H0521-08)				Matrix: Wate	ər	Batch	: 0080571	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 97 % 95 %	Limits: 50-150 % 50-150 %		08/20/20 19:22 08/20/20 19:22	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-3 (A0H0521-09)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 19:50	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 93 % 98 %	Limits: 50-150 % 50-150 %		08/20/20 19:50 08/20/20 19:50	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-4 (A0H0521-10)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 20:17	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 96 % 101 %	Limits: 50-150 % 50-150 %		08/20/20 20:17 08/20/20 20:17	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-2 (A0H0521-11)				Matrix: Wate	ər	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 20:44	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 92 % 96 %	Limits: 50-150 % 50-150 %		08/20/20 20:44 08/20/20 20:44	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-1 (A0H0521-12)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 21:11	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 94 % 99 %	Limits: 50-150 % 50-150 %		08/20/20 21:11 08/20/20 21:11	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-11 (A0H0521-13RE1)				Matrix: Wate	er	Batch	: 0080657	
Gasoline Range Organics	13.9		1.00	mg/L	10	08/24/20 12:58	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recove	ry: 100 % 95 %	Limits: 50-150 % 50-150 %		08/24/20 12:58 08/24/20 12:58	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-11 Dup (A0H0521-14RE1)				Matrix: Wate	er	Batch	: 0080657	
Gasoline Range Organics	22.9		5.00	mg/L	50	08/24/20 13:25	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur) 1,4-Difluorobenzene (Sur)		Recov	ery: 97 % 95 %	Limits: 50-150 % 50-150 %		08/24/20 13:25 08/24/20 13:25	NWTPH-Gx (MS) NWTPH-Gx (MS)	
MW-10 (A0H0521-15)				Matrix: Wate	er	Batch	: 0080571	
Gasoline Range Organics	ND		0.100	mg/L	1	08/20/20 15:44	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	ery: 92 %	Limits: 50-150 %	5 <i>1</i>	08/20/20 15:44	NWTPH-Gx (MS)	

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

Gaso	line Range Hy	drocarbons	(Benzene tl	rough Naphth	nalene) by	NWTPH-Gx		
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-10 (A0H0521-15)				Matrix: Wa	ter	Batch	: 0080571	
Surrogate: 1,4-Difluorobenzene (Sur)		Reco	very: 93 %	Limits: 50-150	% 1	08/20/20 15:44	NWTPH-Gx (MS)	

Apex Laboratories

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Goas Smerighini





ORELAP ID: OR100062

<u>Cascadia Associates</u>
Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Select	ted Volatile C	rganic Com	pounds by EPA	4 8260D			
Anglista	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Analyte	Result	LIIIII	Lilliit					Notes
MW-5 (A0H0521-01)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		2.00	ug/L	10	08/20/20 14:22	EPA 8260D	
Ethylbenzene	154		5.00	ug/L	10	08/20/20 14:22	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	08/20/20 14:22	EPA 8260D	
Naphthalene	1400		20.0	ug/L	10	08/20/20 14:22	EPA 8260D	
Toluene	ND		10.0	ug/L	10	08/20/20 14:22	EPA 8260D	
Xylenes, total	704		15.0	ug/L	10	08/20/20 14:22	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 96 %	Limits: 80-120 %	1	08/20/20 14:22	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	08/20/20 14:22	EPA 8260D	
4-Bromofluorobenzene (Surr)			95 %	80-120 %	1	08/20/20 14:22	EPA 8260D	
MW-5 Dup (A0H0521-02)				Matrix: Wate	er	Batch:	0080571	
Benzene	ND		2.00	ug/L	10	08/20/20 15:16	EPA 8260D	
Ethylbenzene	210		5.00	ug/L	10	08/20/20 15:16	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	08/20/20 15:16	EPA 8260D	
Naphthalene	1740		20.0	ug/L	10	08/20/20 15:16	EPA 8260D	
Toluene	ND		10.0	ug/L	10	08/20/20 15:16	EPA 8260D	
Xylenes, total	940		15.0	ug/L	10	08/20/20 15:16	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 98 %	Limits: 80-120 %	1	08/20/20 15:16	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	08/20/20 15:16	EPA 8260D	
4-Bromofluorobenzene (Surr)			95 %	80-120 %	1	08/20/20 15:16	EPA 8260D	
MW-5D (A0H0521-03)				Matrix: Wate	er	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 17:06	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 17:06	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 17:06	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 17:06	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 17:06	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 17:06	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 96 %	Limits: 80-120 %	1	08/20/20 17:06	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 17:06	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	08/20/20 17:06	EPA 8260D	
MW-8 (A0H0521-04)				Matrix: Wate	er	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 17:33	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 17:33	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 17:33	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 17:33	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Seiec	teu voiatile Orț	Janic Con	pounds by EPA	4 020UD			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
/IW-8 (A0H0521-04)				Matrix: Wate	r	Batch:	0080571	
Toluene	ND		1.00	ug/L	1	08/20/20 17:33	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 17:33	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	ry: 97%	Limits: 80-120 %	1	08/20/20 17:33	EPA 8260D	
Toluene-d8 (Surr)			101 %	80-120 %	1	08/20/20 17:33	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	08/20/20 17:33	EPA 8260D	
MW-8D (A0H0521-05)		Matrix: Water Batch: 0080571						
Benzene	ND		0.200	ug/L	1	08/20/20 18:01	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 18:01	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 18:01	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 18:01	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 18:01	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 18:01	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	ry: 98 %	Limits: 80-120 %	1	08/20/20 18:01	EPA 8260D	
Toluene-d8 (Surr)			101 %	80-120 %	1	08/20/20 18:01	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	08/20/20 18:01	EPA 8260D	
MW-7 (A0H0521-06)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 18:28	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 18:28	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 18:28	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 18:28	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 18:28	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 18:28	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 100 %	Limits: 80-120 %	1	08/20/20 18:28	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 18:28	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	08/20/20 18:28	EPA 8260D	
MW-9 (A0H0521-07)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 18:55	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 18:55	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 18:55	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 18:55	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 18:55	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 18:55	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	ry: 96%	Limits: 80-120 %	1	08/20/20 18:55	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 18:55	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Selec	ted Volatile C	rganic Con	pounds by EPA	8260D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-9 (A0H0521-07)				Matrix: Water	r	Batch:	0080571	
Surrogate: 4-Bromofluorobenzene (Surr)		Recov	ery: 106%	Limits: 80-120 %	1	08/20/20 18:55	EPA 8260D	
MW-6 (A0H0521-08)				Matrix: Water	r	Batch:	0080571	
Benzene	166		2.00	ug/L	10	08/20/20 19:22	EPA 8260D	
Ethylbenzene	1790		5.00	ug/L	10	08/20/20 19:22	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	08/20/20 19:22	EPA 8260D	
Naphthalene	316		20.0	ug/L	10	08/20/20 19:22	EPA 8260D	
Toluene	34.5		10.0	ug/L	10	08/20/20 19:22	EPA 8260D	
Xylenes, total	370		15.0	ug/L	10	08/20/20 19:22	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 94 %	Limits: 80-120 %	1	08/20/20 19:22	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	08/20/20 19:22	EPA 8260D	
4-Bromofluorobenzene (Surr)			96 %	80-120 %	1	08/20/20 19:22	EPA 8260D	
MW-3 (A0H0521-09)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 19:50	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 19:50	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 19:50	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 19:50	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 19:50	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 19:50	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 97 %	Limits: 80-120 %	1	08/20/20 19:50	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 19:50	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	1	08/20/20 19:50	EPA 8260D	
MW-4 (A0H0521-10)				Matrix: Water	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 20:17	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 20:17	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 20:17	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 20:17	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 20:17	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 20:17	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recov	ery: 101 %	Limits: 80-120 %	1	08/20/20 20:17	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 20:17	EPA 8260D	
4-Bromofluorobenzene (Surr)			101 %	80-120 %	1	08/20/20 20:17	EPA 8260D	
MW-2 (A0H0521-11)	IW-2 (A0H0521-11)			Matrix: Water	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 20:44	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u>
Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Note
MW-2 (A0H0521-11)				Matrix: Wate	r	Batch:	0080571	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 20:44	EPA 8260D	
Methyl tert-butyl ether (MTBE)	5.21		1.00	ug/L	1	08/20/20 20:44	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 20:44	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 20:44	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 20:44	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recon	very: 94 %	Limits: 80-120 %	1	08/20/20 20:44	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 20:44	EPA 8260D	
4-Bromofluorobenzene (Surr)			103 %	80-120 %	1	08/20/20 20:44	EPA 8260D	
MW-1 (A0H0521-12)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 21:11	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 21:11	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 21:11	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 21:11	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 21:11	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 21:11	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recon	very: 95 %	Limits: 80-120 %	1	08/20/20 21:11	EPA 8260D	
Toluene-d8 (Surr)			101 %	80-120 %	1	08/20/20 21:11	EPA 8260D	
4-Bromofluorobenzene (Surr)			102 %	80-120 %	I	08/20/20 21:11	EPA 8260D	
MW-11 (A0H0521-13)				Matrix: Wate	r	Batch:	0080571	
Benzene	3.37		0.200	ug/L	1	08/20/20 21:39	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 21:39	EPA 8260D	
Naphthalene	90.6		2.00	ug/L	1	08/20/20 21:39	EPA 8260D	
Toluene	175		1.00	ug/L	1	08/20/20 21:39	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recon	very: 96 %	Limits: 80-120 %	1	08/20/20 21:39	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 21:39	EPA 8260D	
4-Bromofluorobenzene (Surr)			97 %	80-120 %	1	08/20/20 21:39	EPA 8260D	
MW-11 (A0H0521-13RE1)				Matrix: Wate	r	Batch:	0080657	
Ethylbenzene	817		5.00	ug/L	10	08/24/20 12:58	EPA 8260D	
Xylenes, total	2930		15.0	ug/L	10	08/24/20 12:58	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Reco	very: 98 %	Limits: 80-120 %	1	08/24/20 12:58	EPA 8260D	
Toluene-d8 (Surr)			96 %	80-120 %	1	08/24/20 12:58	EPA 8260D	
4-Bromofluorobenzene (Surr)			100 %	80-120 %	I	08/24/20 12:58	EPA 8260D	
MW-11 Dup (A0H0521-14)				Matrix: Wate	ır	Ratch:	0080571	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

ANALYTICAL SAMPLE RESULTS

	Select	ted Volatile Or	ganic Com	pounds by EPA	8260D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-11 Dup (A0H0521-14)				Matrix: Wate	r	Batch:	0080571	
Benzene	5.41		0.200	ug/L	1	08/20/20 22:06	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 22:06	EPA 8260D	
Naphthalene	145		2.00	ug/L	1	08/20/20 22:06	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recove	ery: 97%	Limits: 80-120 %	1	08/20/20 22:06	EPA 8260D	
Toluene-d8 (Surr)			98 %	80-120 %	1	08/20/20 22:06	EPA 8260D	
4-Bromofluorobenzene (Surr)			98 %	80-120 %	1	08/20/20 22:06	EPA 8260D	
MW-11 Dup (A0H0521-14RE1)				Matrix: Wate	r	Batch:	0080657	
Ethylbenzene	1360		25.0	ug/L	50	08/24/20 13:25	EPA 8260D	
Toluene	268		50.0	ug/L	50	08/24/20 13:25	EPA 8260D	
Xylenes, total	4810		75.0	ug/L	50	08/24/20 13:25	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recove	ery: 94 %	Limits: 80-120 %	1	08/24/20 13:25	EPA 8260D	
Toluene-d8 (Surr)			99 %	80-120 %	1	08/24/20 13:25	EPA 8260D	
4-Bromofluorobenzene (Surr)			104 %	80-120 %	1	08/24/20 13:25	EPA 8260D	
MW-10 (A0H0521-15)				Matrix: Wate	r	Batch:	0080571	
Benzene	ND		0.200	ug/L	1	08/20/20 15:44	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	08/20/20 15:44	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	08/20/20 15:44	EPA 8260D	
Naphthalene	ND		2.00	ug/L	1	08/20/20 15:44	EPA 8260D	
Toluene	ND		1.00	ug/L	1	08/20/20 15:44	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	08/20/20 15:44	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recove	ery: 97 %	Limits: 80-120 %	1	08/20/20 15:44	EPA 8260D	
Toluene-d8 (Surr)			100 %	80-120 %	1	08/20/20 15:44	EPA 8260D	
4-Bromofluorobenzene (Surr)			104 %	80-120 %	1	08/20/20 15:44	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury

Report ID: A0H0521 - 09 03 20 0816

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbon	s by NW	ГРН-Dx						
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Not	tes
Batch 0080739 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0080739-BLK1)		Prepared	: 08/25/20 13:	05 Analyz	ed: 08/25/2	0 21:03							
NWTPH-Dx													
Diesel	0.202		0.182	mg/L	1							В	
Oil	ND		0.364	mg/L	1							B-02	
Surr: o-Terphenyl (Surr)		Reco	very: 105 %	Limits: 50	0-150 %	Dill	ution: 1x						
LCS (0080739-BS1)		Prepared	: 08/25/20 13:	05 Analyz	ed: 08/25/2	0 21:26							
NWTPH-Dx													
Diesel	1.07		0.200	mg/L	1	1.25		86	59 - 115%			В	
Surr: o-Terphenyl (Surr)		Reco	very: 111 %	Limits: 50	0-150 %	Dill	ution: 1x						
LCS Dup (0080739-BSD1)		Prepared	: 08/25/20 13:	05 Analyz	ed: 08/25/2	0 21:49							Q-1
NWTPH-Dx													
Diesel	1.23		0.200	mg/L	1	1.25		98	59 - 115%	14	30%	В	
Surr: o-Terphenyl (Surr)		Reco	very: 113 %	Limits: 50)-150 %	Dill	ution: 1x						
Batch 0080793 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0080793-BLK1)		Prepared	: 08/26/20 15:	29 Analyz	ed: 08/26/2	0 23:51							
NWTPH-Dx													
Diesel	ND		0.0182	mg/L	1								
Oil	ND		0.0364	mg/L	1								
Surr: o-Terphenyl (Surr)		Rece	overy: 87 %	Limits: 50	0-150 %	Dila	ution: 1x						
LCS (0080793-BS1)		Prepared	: 08/26/20 15:	29 Analyz	ed: 08/27/2	0 00:13							
NWTPH-Dx													
Diesel	1.15		0.200	mg/L	1	1.25		92	59 - 115%				
Surr: o-Terphenyl (Surr)		Reco	very: 105 %	Limits: 50)-150 %	Dill	ution: 1x						
LCS Dup (0080793-BSD1)		Prepared	: 08/26/20 15:	29 Analyz	ed: 08/27/2	0 00:36							Q-1
NWTPH-Dx													
Diesel	1.15		0.200	mg/L	1	1.25		92	59 - 115%	0.7	30%		

Apex Laboratories

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B

Portland, OR 97239

Project:

Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury

Report ID: A0H0521 - 09 03 20 0816

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbor	s by NW	TPH-Dx					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0080922 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er				
Blank (0080922-BLK1)		Prepared	: 08/31/20 11:	00 Analyz	ed: 09/01/2	0 23:59						
NWTPH-Dx												
Diesel	ND		0.182	mg/L	1							
Oil	ND		0.364	mg/L	1							
Surr: o-Terphenyl (Surr)		Rec	overy: 87 %	Limits: 50	-150 %	Dilt	ution: 1x					
LCS (0080922-BS1)		Prepared	: 08/31/20 11:	00 Analyz	ed: 09/01/2	0 00:22						
NWTPH-Dx												
Diesel	1.14		0.200	mg/L	1	1.25		92	59 - 115%			
Surr: o-Terphenyl (Surr)		Reco	very: 111 %	Limits: 50	1-150 %	Dilı	ution: 1x					
LCS Dup (0080922-BSD1)		Prepared	: 08/31/20 11:	00 Analyz	ed: 09/01/2	0 00:45						Q-19
NWTPH-Dx												
Diesel	1.17		0.200	mg/L	1	1.25		93	59 - 115%	2	30%	
Surr: o-Terphenyl (Surr)		Reco	very: 110 %	Limits: 50	-150 %	Dili	ution: 1x					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B

Portland, OR 97239

Project:

Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Report ID: A0H0521 - 09 03 20 0816

Project Manager: Stephanie Salisbury

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolir	ne Range F	lydrocarbo	ns (Benz	ene thro	ugh Naph	thalene) l	y NWTP	H-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0080571 - EPA 5030B							Wat	er				
Blank (0080571-BLK1)		Prepared	: 08/20/20 09:	00 Analyz	ed: 08/20/2	0 11:38						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Reco	overy: 93 %	Limits: 50	0-150 %	Dilt	ution: 1x					
1,4-Difluorobenzene (Sur)			92 %	50	-150 %		"					
LCS (0080571-BS2)		Prepared	: 08/20/20 09:	00 Analyz	ed: 08/20/2	0 11:11						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.592		0.100	mg/L	1	0.500		118 8	80 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 100 %	Limits: 50	0-150 %	Dilt	ution: 1x					
1,4-Difluorobenzene (Sur)			98 %	50	-150 %		"					
Duplicate (0080571-DUP2)		Prepared	: 08/20/20 11:	22 Analyz	ed: 08/20/2	0 14:49						
QC Source Sample: MW-5 (A0H)	<u>0521-01)</u>											
NWTPH-Gx (MS)												
Gasoline Range Organics	18.7		1.00	mg/L	10		18.8			0.8	30%	
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 100 %	Limits: 50	0-150 %	Dilt	ution: 1x					

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ORELAP ID: OR100062

Report ID:

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B

Portland, OR 97239

Project: Shore Terminal-Vancouver Annex

Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury A0H0521 - 09 03 20 0816

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolii	ne Range F	lydrocarbo	ns (Benz	ene throu	ugh Naph	thalene) l	by NWTF	H-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0080657 - EPA 5030B							Wat	er				
Blank (0080657-BLK1)		Prepared	: 08/24/20 07:	10 Analyz	ed: 08/24/20	0 09:58						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Reco	overy: 98 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
1,4-Difluorobenzene (Sur)			100 %	50	-150 %		"					
LCS (0080657-BS2)		Prepared	: 08/24/20 07:	10 Analyz	ed: 08/24/20	0 08:37						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.517		0.100	mg/L	1	0.500		103	80 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Recon	very: 100 %	Limits: 50	-150 %	Dilı	ution: 1x					
1,4-Difluorobenzene (Sur)			95 %	50	-150 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u>
Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 82601	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0080571 - EPA 5030B							Wat	er				
Blank (0080571-BLK1)		Prepared	: 08/20/20 09:	00 Analyz	ed: 08/20/20	11:38						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
Toluene	ND		1.00	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Rece	overy: 94 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			98 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			104 %	80	-120 %		"					
LCS (0080571-BS1)		Prepared	: 08/20/20 09:	00 Analyz	ed: 08/20/20	0 10:44						
EPA 8260D												
Benzene	20.8		0.200	ug/L	1	20.0		104	80 - 120%			
Ethylbenzene	20.6		0.500	ug/L	1	20.0		103	80 - 120%			
Methyl tert-butyl ether (MTBE)	21.4		1.00	ug/L	1	20.0		107	80 - 120%			
Naphthalene	19.6		2.00	ug/L	1	20.0		98	80 - 120%			
Toluene	19.6		1.00	ug/L	1	20.0		98	80 - 120%			
Xylenes, total	63.6		1.50	ug/L	1	60.0		106	80 - 120%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	overy: 94 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			96 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			96 %	80	-120 %		"					
Duplicate (0080571-DUP2)		Prepared	: 08/20/20 11:	22 Analyz	ed: 08/20/20) 14:49						
OC Source Sample: MW-5 (A0H0 EPA 8260D	<u>0521-01)</u>											
Benzene	ND		2.00	ug/L	10		ND				30%	
Ethylbenzene	158		5.00	ug/L	10		154			3	30%	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10		ND				30%	
Naphthalene	1430		20.0	ug/L	10		1400			2	30%	
Toluene	ND		10.0	ug/L	10		ND				30%	
Xylenes, total	713		15.0	ug/L	10		704			1	30%	
Surr: 1,4-Difluorobenzene (Surr)		Reci	overy: 97 %		0-120 %	Dilı	ution: 1x			-		
Toluene-d8 (Surr)		Nece	99 %		-120 %	Diii	nion. 1x					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

QUALITY CONTROL (QC) SAMPLE RESULTS

		Selec	cted Volatil	e Organi	c Compo	unds by E	PA 8260I	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Note
Batch 0080571 - EPA 5030B							Wat	er				
Duplicate (0080571-DUP2)		Prepared	: 08/20/20 11::	22 Analyz	zed: 08/20/2	0 14:49						
QC Source Sample: MW-5 (A0H0	<u>521-01)</u>											
Surr: 4-Bromofluorobenzene (Surr)		Reco	overy: 95 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Matrix Spike (0080571-MS1)		Prepared	: 08/20/20 11::	22 Analyz	zed: 08/20/2	0 16:11						
OC Source Sample: MW-10 (A0H	0521-15)											
EPA 8260D												
Benzene	21.1		0.200	ug/L	1	20.0	ND	106	79 - 120%			
Ethylbenzene	21.0		0.500	ug/L	1	20.0	ND	105	79 - 121%			
Methyl tert-butyl ether (MTBE)	21.6		1.00	ug/L	1	20.0	ND	108	71 - 124%			
Naphthalene	19.8		2.00	ug/L	1	20.0	ND	90	51 - 128%			
Toluene	20.1		1.00	ug/L	1	20.0	ND	101 8	30 - 121%			
Xylenes, total	65.0		1.50	ug/L	1	60.0	ND	108	79 - 121%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	overy: 96 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			99 %	80	0-120 %		"					
4-Bromofluorobenzene (Surr)			97 %	80	0-120 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

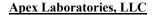
QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 8260I					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0080657 - EPA 5030B							Wate	er				
Blank (0080657-BLK1)		Prepared	: 08/24/20 07:	10 Analyz	ed: 08/24/20	0 09:58						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
1,2-Dibromoethane (EDB)	ND		0.500	ug/L	1							
1,2-Dichloroethane (EDC)	ND		0.500	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Isopropylbenzene	ND		1.00	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
Toluene	ND		1.00	ug/L	1							
1,2,4-Trimethylbenzene	ND		1.00	ug/L	1							
1,3,5-Trimethylbenzene	ND		1.00	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Rec	overy: 98 %	Limits: 80	-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			98 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			107 %	80	-120 %		"					
LCS (0080657-BS1)		Prepared	: 08/24/20 07:	10 Analyz	ed: 08/24/20	0 08:09						
EPA 8260D												
Benzene	20.4		0.200	ug/L	1	20.0		102	30 - 120%			
1,2-Dibromoethane (EDB)	21.6		0.500	ug/L	1	20.0		108	30 - 120%			
1,2-Dichloroethane (EDC)	22.0		0.500	ug/L	1	20.0		110 8	30 - 120%			
Ethylbenzene	21.3		0.500	ug/L	1	20.0		106	30 - 120%			
Isopropylbenzene	23.4		1.00	ug/L	1	20.0		117 8	30 - 120%			
Methyl tert-butyl ether (MTBE)	22.2		1.00	ug/L	1	20.0		111 8	30 - 120%			
Naphthalene	17.4		2.00	ug/L	1	20.0		87 8	30 - 120%			
Toluene	19.6		1.00	ug/L	1	20.0		98 8	30 - 120%			
1,2,4-Trimethylbenzene	23.1		1.00	ug/L	1	20.0		115 8	30 - 120%			
1,3,5-Trimethylbenzene	23.4		1.00	ug/L	1	20.0		117 8	30 - 120%			
Xylenes, total	65.0		1.50	ug/L	1	60.0		108	30 - 120%			
Surr: 1,4-Difluorobenzene (Surr)		Rec	overy: 96 %	Limits: 80	-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			97 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			96 %	80	-120 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

SAMPLE PREPARATION INFORMATION

		Diesel an	d/or Oil Hydrocarbor	s by NWTPH-Dx			
Prep: EPA 3510C (F	uels/Acid Ext.)				Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0080739							
A0H0521-04	Water	NWTPH-Dx	08/17/20 11:14	08/25/20 13:05	1070 mL/5 mL	1000mL/5mL	0.94
A0H0521-06	Water	NWTPH-Dx	08/17/20 12:28	08/25/20 13:05	1070 mL/5 mL	1000 mL/5 mL	0.94
Batch: 0080793							
A0H0521-08	Water	NWTPH-Dx	08/17/20 14:27	08/26/20 15:29	1060mL/5mL	1000mL/5mL	0.94
Batch: 0080922							
A0H0521-01RE1	Water	NWTPH-Dx	08/17/20 09:57	08/31/20 11:00	1060mL/5mL	1000mL/5mL	0.94
A0H0521-02RE1	Water	NWTPH-Dx	08/17/20 09:57	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-03RE1	Water	NWTPH-Dx	08/17/20 10:36	08/31/20 13:55	1070mL/5mL	1000mL/5mL	0.94
A0H0521-05RE1	Water	NWTPH-Dx	08/17/20 11:51	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-07RE1	Water	NWTPH-Dx	08/17/20 13:34	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-09	Water	NWTPH-Dx	08/18/20 08:00	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-10	Water	NWTPH-Dx	08/18/20 09:09	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-11	Water	NWTPH-Dx	08/18/20 10:51	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-12	Water	NWTPH-Dx	08/19/20 08:27	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
А0Н0521-13	Water	NWTPH-Dx	08/19/20 09:02	08/31/20 13:55	1070mL/5mL	1000mL/5mL	0.94
A0H0521-14	Water	NWTPH-Dx	08/19/20 09:02	08/31/20 13:55	1060mL/5mL	1000mL/5mL	0.94
A0H0521-15	Water	NWTPH-Dx	08/19/20 11:40	08/31/20 13:55	1070mL/5mL	1000mL/5mL	0.94

	Gas	soline Range Hydrocart	oons (Benzene thro	ugh Naphthalene) b	y NWTPH-Gx		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0080571							
A0H0521-01	Water	NWTPH-Gx (MS)	08/17/20 09:57	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-02	Water	NWTPH-Gx (MS)	08/17/20 09:57	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-03	Water	NWTPH-Gx (MS)	08/17/20 10:36	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-04	Water	NWTPH-Gx (MS)	08/17/20 11:14	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-05	Water	NWTPH-Gx (MS)	08/17/20 11:51	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-06	Water	NWTPH-Gx (MS)	08/17/20 12:28	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-07	Water	NWTPH-Gx (MS)	08/17/20 13:34	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-08	Water	NWTPH-Gx (MS)	08/17/20 14:27	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-09	Water	NWTPH-Gx (MS)	08/18/20 08:00	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-10	Water	NWTPH-Gx (MS)	08/18/20 09:09	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-11	Water	NWTPH-Gx (MS)	08/18/20 10:51	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-12	Water	NWTPH-Gx (MS)	08/19/20 08:27	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

SAMPLE PREPARATION INFORMATION

	Gas	soline Range Hydrocart	oons (Benzene thro	ugh Naphthalene) b	y NWTPH-Gx		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A0H0521-15	Water	NWTPH-Gx (MS)	08/19/20 11:40	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
Batch: 0080657							
A0H0521-13RE1	Water	NWTPH-Gx (MS)	08/19/20 09:02	08/24/20 09:35	5mL/5mL	5mL/5mL	1.00
A0H0521-14RE1	Water	NWTPH-Gx (MS)	08/19/20 09:02	08/24/20 09:35	5mL/5mL	5mL/5mL	1.00

Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0080571							
A0H0521-01	Water	EPA 8260D	08/17/20 09:57	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-02	Water	EPA 8260D	08/17/20 09:57	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-03	Water	EPA 8260D	08/17/20 10:36	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-04	Water	EPA 8260D	08/17/20 11:14	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-05	Water	EPA 8260D	08/17/20 11:51	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-06	Water	EPA 8260D	08/17/20 12:28	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-07	Water	EPA 8260D	08/17/20 13:34	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-08	Water	EPA 8260D	08/17/20 14:27	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-09	Water	EPA 8260D	08/18/20 08:00	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-10	Water	EPA 8260D	08/18/20 09:09	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-11	Water	EPA 8260D	08/18/20 10:51	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-12	Water	EPA 8260D	08/19/20 08:27	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-13	Water	EPA 8260D	08/19/20 09:02	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
A0H0521-14	Water	EPA 8260D	08/19/20 09:02	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
А0Н0521-15	Water	EPA 8260D	08/19/20 11:40	08/20/20 11:22	5mL/5mL	5mL/5mL	1.00
Batch: 0080657							
A0H0521-13RE1	Water	EPA 8260D	08/19/20 09:02	08/24/20 09:35	5mL/5mL	5mL/5mL	1.00
A0H0521-14RE1	Water	EPA 8260D	08/19/20 09:02	08/24/20 09:35	5mL/5mL	5mL/5mL	1.00

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit B Project Number: GWM 3Q20 Report ID:

Portland, OR 97239 Project Manager: Stephanie Salisbury A0H0521 - 09 03 20 0816

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

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В	Analyte detected in an	associated blank at a lev	el above the MRL.	(See Notes and Conventions below.)	
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- B-02 Analyte detected in an associated blank at a level between one-half the MRL and the MRL. (See Notes and Conventions below.)
- F-18 Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
- **F-20** Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.
- Q-19 Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.

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ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")

See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

"___" Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

"---" QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

- -For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
- -For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> Project: <u>Shore Terminal-Vancouver Annex</u>

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia Associates Project: Shore Terminal-Vancouver Annex

5820 SW Kelly Ave Unit BProject Number: GWM 3Q20Report ID:Portland, OR 97239Project Manager: Stephanie SalisburyA0H0521 - 09 03 20 0816

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the <u>exception</u> of any analyte(s) listed below:

Apex Laboratories

Matrix Analysis TNI_ID Analyte TNI_ID Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Cascadia Associates

Project:

Shore Terminal-Vancouver Annex

5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: GWM 3Q20

Project Manager: Stephanie Salisbury

Report ID: A0H0521 - 09 03 20 0816

LEGING Date: īme: MTSE, Naphthalana by FPA 8240 RECEIVED BY: Signature: Cascockided 35 oc Printed N TCLP Metals (8) Al, Sb, As, Bs, Be, Cd, Cs, Cr, Co, Cu, Fe, Pb, Hg, Mg, An, Mo, Mi, K, Se, Ag, Ws, Tl, J, Zn Nu Star Varner GWM 302 Date: Priority Metals (13) RCRA Metals (8) 8087 bCB2 CHAIN OF CUSTODY 8270 Semi-Vols Full List SHA9 MIS 0728 8700 AOCs Euli Fist 8700 Halo VOCs 8700 KBDM AOC 5 8760 BTEX NWTPH-Gx XG-HJLAN Other: NWTPH-HCID # OF CONTAINERS XIMTAM SAMPLES ARE HELD FOR 30 DAYS 700 SW Sandburg St., Tigard, OR 97223 Ph. 503-718-2323 8 2 Day SDAY 334 끌 5 8 LIME 5/13 00 TAC 4 DAY 1 Day LAB ID # TAT Requested (circle) APEX LABS MW- 8D 5870 MW-7 OR WA 9 Site Location

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia Associates

Portland, OR 97239

Project:

Shore Terminal-Vancouver Annex

5820 SW Kelly Ave Unit B

Project Number: **GWM 3Q20**

Project Manager: Stephanie Salisbury

Report ID: A0H0521 - 09 03 20 0816

COC Cot	ioter.co											_	Date:	Time:	
10 0 0 0 0 0 0 0 0 0	JTEPHOLICE TOLISHING Project Name: ALISHIN YELL ROLL & BOACH #. BARROWLE Phome (50) 906-6577 Final: SUSCISHIN YE COSCORISH OSSOCIOSTAN COM		TCLP Metals (8) MTBE * Maghthalans*	7				# #			MTBE, Naphthalene 5y EPA BELEO	Tib Trip Blank present, hold bor PM	RECEIVED BY: Signature:	Printed Name:	Сопрану:
Tao#	254 Le CSTATEMEN LUDAN LANGER ALM 30 BOCCH.	REQUEST	Priority Metals (13) Al. Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Ma, Mo, Mi, K, Se, Ag, Wa, Tl, V, Zh								ine by	rsewst, r	Date:	Time:	
,	Jenne Jishur	ANALYSIS REQUEST	8081 Pest RCRA Metals (8)							CTIONS:	aphthal	laukp	2		
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6/00 SW Sa	Address: 5	Sampled by:	OR (WA	7-3	MW.	MW-11	MW-10				TATR		Signardie:	ă , l	Cascacia

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Cascadia Associates
5820 SW Kelly Ave Unit

Project:

Shore Terminal-Vancouver Annex

5820 SW Kelly Ave Unit B

Project Number: GWM 3Q20

Report ID:

Portland, OR 97239

Project Manager: Stephanie Salisbury

A0H0521 - 09 03 20 0816

Client:	Cascadia	Associates	Eleme	nt WO#: A0H0521
roject/I		tar Vancouver		
Delivery				
		110 @ 1507 B	v: AUK	
				Senvoy SDS Other
Cooler I	nspection Date	e/time inspected: \$\\9\	W @ 1515	By: ACC
Chain of	Custody included	? Yes X No	Custody seals?	YesNo_X
	ated by client?	Yes \nearrow No		
Signed/da	ated by Apex?	Yes Y No		
		Cooler #1 Cooler #2 C	Cooler #3 Cooler #4	Cooler #5 Cooler #6 Cooler #7
Temperat	ture (°C)	5.6 3.6	0.1	
Received	on ice? (Y/N)	<u> </u>	٧	www.
Γemp. bl	anks? (Y/N)	1 1	1	
ce type:	(Gel/Real/Other)	Real Real	Real	
Condition				
Cooler ou	ut of temp? (Y/N) coolers are in temp	Possible reason why: and some out, were green	xî 🔥 ``	f temperature samples? Yes/No/N
Cooler ou If some co Out of ter Samples	ut of temp? (YN) coolers are in temp mperature samples Inspection: Da	Possible reason why: and some out, were green	dots applied to out of	Ву:
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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Thursday, December 3, 2020 Stephanie Salisbury Cascadia Associates 5820 SW Kelly Ave Unit B Portland, OR 97239

RE: A0K0700 - Nustar Vannex - 0060-001-001

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A0K0700, which was received by the laboratory on 11/17/2020 at 5:00:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample reciept, unless prior arrangements have been made.

Coole	r Rece	ipt Into	ormation
		-	

(See Cooler Receipt Form for details)

Cooler#1 5.9 degC Cooler#2 5.5 degC Cooler#3 5.4 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.





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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

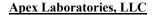
Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL REPORT FOR SAMPLES

	SAMPLE INFORM	ATION		
Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-5	A0K0700-01	Water	11/16/20 09:58	11/17/20 17:00
MW-5D	A0K0700-02	Water	11/16/20 10:29	11/17/20 17:00
MW-8	A0K0700-03	Water	11/16/20 11:02	11/17/20 17:00
MW-8D	A0K0700-04	Water	11/16/20 11:39	11/17/20 17:00
MW-9	A0K0700-05	Water	11/16/20 12:24	11/17/20 17:00
MW-7	A0K0700-06	Water	11/16/20 13:12	11/17/20 17:00
MW-10	A0K0700-07	Water	11/16/20 14:20	11/17/20 17:00
MW-2	A0K0700-08	Water	11/17/20 08:06	11/17/20 17:00
MW-1	A0K0700-09	Water	11/17/20 09:10	11/17/20 17:00
MW-11	A0K0700-10	Water	11/17/20 09:54	11/17/20 17:00
MW-4	A0K0700-11	Water	11/17/20 10:42	11/17/20 17:00
MW-3	A0K0700-12	Water	11/17/20 11:24	11/17/20 17:00
MW-6	A0K0700-13	Water	11/17/20 12:14	11/17/20 17:00
MW-6 Dup	A0K0700-14	Water	11/17/20 12:14	11/17/20 17:00

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Die	esel and/or O	il Hydrocar	bons by NWTP	H-Dx			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5 (A0K0700-01)				Matrix: Wat	er	Batch		
Diesel	1.92		0.0755	mg/L	1	11/20/20 23:55	NWTPH-Dx LL	F-18
Oil	ND		0.151	mg/L	1	11/20/20 23:55	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 89 %	Limits: 50-150 %	6 1	11/20/20 23:55	NWTPH-Dx LL	
MW-5D (A0K0700-02)				Matrix: Wat	er	Batch	: 0110834	
Diesel	ND		0.0748	mg/L	1	11/23/20 23:24	NWTPH-Dx LL	
Oil	ND		0.150	mg/L	1	11/23/20 23:24	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 95 %	Limits: 50-150 %	% 1	11/23/20 23:24	NWTPH-Dx LL	Q-41
MW-8 (A0K0700-03)				Matrix: Wat	er	Batch	: 0110834	
Diesel	ND		0.0755	mg/L	1	11/23/20 23:45	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	11/23/20 23:45	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 89 %	Limits: 50-150 %	6 1	11/23/20 23:45	NWTPH-Dx LL	Q-41
MW-8D (A0K0700-04)				Matrix: Wat	er	Batch	: 0110834	
Diesel	ND		0.0748	mg/L	1	11/24/20 00:07	NWTPH-Dx LL	
Oil	ND		0.150	mg/L	1	11/24/20 00:07	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 109 %	Limits: 50-150 %	% I	11/24/20 00:07	NWTPH-Dx LL	Q-41
MW-9 (A0K0700-05)				Matrix: Wat	er	Batch	: 0111007	
Diesel	ND		0.0755	mg/L	1	12/01/20 00:06	NWTPH-Dx LL	
Oil	ND		0.151	mg/L	1	12/01/20 00:06	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 91 %	Limits: 50-150 %	6 1	12/01/20 00:06	NWTPH-Dx LL	
MW-7 (A0K0700-06)				Matrix: Wat	er	Batch	: 0111007	
Diesel	ND		0.0748	mg/L	1	12/01/20 00:28	NWTPH-Dx LL	
Oil	ND		0.150	mg/L	1	12/01/20 00:28	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 94 %	Limits: 50-150 %	% I	12/01/20 00:28	NWTPH-Dx LL	
MW-10 (A0K0700-07)				Matrix: Wat	er	Batch	: 0111007	
Diesel	ND		0.0748	mg/L	1	12/01/20 00:50	NWTPH-Dx LL	
Oil	ND		0.150	mg/L	1	12/01/20 00:50	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 91 %	Limits: 50-150 %	6 1	12/01/20 00:50	NWTPH-Dx LL	
MW-2 (A0K0700-08)				Matrix: Water		Batch		
Diesel	ND		0.0755	mg/L	1	12/01/20 23:07	NWTPH-Dx LL	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Die	sel and/or O	il Hydrocar	bons by NWTP	H-Dx			
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-2 (A0K0700-08)				Matrix: Wate	er	Batch	: 0120007	
Oil	ND		0.151	mg/L	1	12/01/20 23:07	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 86 %	Limits: 50-150 %	6 1	12/01/20 23:07	NWTPH-Dx LL	
MW-1 (A0K0700-09)				Matrix: Wate	er	Batch	: 0120007	
Diesel	0.0998		0.0748	mg/L	1	12/01/20 23:29	NWTPH-Dx LL	F-11
Oil	ND		0.150	mg/L	1	12/01/20 23:29	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 84 %	Limits: 50-150 %	6 1	12/01/20 23:29	NWTPH-Dx LL	
MW-11 (A0K0700-10)				Matrix: Wate	er	Batch	: 0120007	
Diesel	0.298		0.0755	mg/L	1	12/01/20 23:51	NWTPH-Dx LL	F-11, F-20
Oil	ND		0.151	mg/L	1	12/01/20 23:51	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Reco	very: 78 %	Limits: 50-150 %	6 1	12/01/20 23:51	NWTPH-Dx LL	
MW-4 (A0K0700-11)				Matrix: Wate	er	Batch	: 0120007	
Diesel	0.0783		0.0755	mg/L	1	12/02/20 00:13	NWTPH-Dx LL	F-11
Oil	ND		0.151	mg/L	1	12/02/20 00:13	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 100 %	Limits: 50-150 %	6 1	12/02/20 00:13	NWTPH-Dx LL	
MW-3 (A0K0700-12)				Matrix: Wate	er	Batch	: 0120007	
Diesel	ND		0.0748	mg/L	1	12/02/20 00:34	NWTPH-Dx LL	
Oil	ND		0.150	mg/L	1	12/02/20 00:34	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 107%	Limits: 50-150 %	6 1	12/02/20 00:34	NWTPH-Dx LL	
MW-6 (A0K0700-13)				Matrix: Wate	er	Batch	: 0120007	PRES
Diesel	4.62		0.0769	mg/L	1	12/02/20 00:56	NWTPH-Dx LL	F-13, F-20
Oil	ND		0.154	mg/L	1	12/02/20 00:56	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recov	ery: 110 %	Limits: 50-150 %	6 1	12/02/20 00:56	NWTPH-Dx LL	
MW-6 Dup (A0K0700-14)				Matrix: Wate	er	Batch	: 0120007	PRES
Diesel	6.93		0.0784	mg/L	1	12/02/20 01:18	NWTPH-Dx LL	F-13, F-20
Oil	ND		0.157	mg/L	1	12/02/20 01:18	NWTPH-Dx LL	
Surrogate: o-Terphenyl (Surr)		Recove	ery: 106 %	Limits: 50-150 %	6 1	12/02/20 01:18	NWTPH-Dx LL	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons	(Benzene th	rough Naphtha	alene) by	NWTPH-Gx		
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5 (A0K0700-01)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	18.5		2.00	mg/L	20	11/19/20 18:35	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 100 %	Limits: 50-150 %	<i>1</i>	11/19/20 18:35	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			112 %	50-150 %	1	11/19/20 18:35	NWTPH-Gx (MS)	
MW-5D (A0K0700-02)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	0.200		0.100	mg/L	1	11/19/20 12:15	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 99 %	Limits: 50-150 %	5 1	11/19/20 12:15	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			109 %	50-150 %	<i>I</i>	11/19/20 12:15	NWTPH-Gx (MS)	
MW-8 (A0K0700-03)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 12:42	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 100 %	Limits: 50-150 %	1	11/19/20 12:42	NWTPH-Gx (MS)	
I,4-Difluorobenzene (Sur)			111 %	50-150 %	1	11/19/20 12:42	NWTPH-Gx (MS)	
MW-8D (A0K0700-04)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 13:10	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recov	very: 99 %	Limits: 50-150 %	1	11/19/20 13:10	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			110 %	50-150 %	5 1	11/19/20 13:10	NWTPH-Gx (MS)	
MW-9 (A0K0700-05)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 13:37	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 102 %	Limits: 50-150 %	5 1	11/19/20 13:37	NWTPH-Gx (MS)	
I,4-Difluorobenzene (Sur)			112 %	50-150 %	<i>I</i>	11/19/20 13:37	NWTPH-Gx (MS)	
MW-7 (A0K0700-06)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 14:04	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 100 %	Limits: 50-150 %	1	11/19/20 14:04	NWTPH-Gx (MS)	
I,4-Difluorobenzene (Sur)			113 %	50-150 %	1	11/19/20 14:04	NWTPH-Gx (MS)	
MW-10 (A0K0700-07)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 14:31	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 103 %	Limits: 50-150 %	1	11/19/20 14:31	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			114 %	50-150 %	<i>I</i>	11/19/20 14:31	NWTPH-Gx (MS)	
MW-2 (A0K0700-08)				Matrix: Wate	er	Batch	ı: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 14:58	NWTPH-Gx (MS)	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

Gasol	ine Range Hy	drocarbons (I	Benzene th	nrough Naphtha	alene) by	NWTPH-Gx		
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-2 (A0K0700-08)				Matrix: Wate	er	Batch	: 0110686	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 92 %	Limits: 50-150 %	5 1	11/19/20 14:58	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			105 %	50-150 %	5 1	11/19/20 14:58	NWTPH-Gx (MS)	
MW-1 (A0K0700-09)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 15:25	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 99 %	Limits: 50-150 %	5 1	11/19/20 15:25	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			111 %	50-150 %	5 1	11/19/20 15:25	NWTPH-Gx (MS)	
MW-11 (A0K0700-10)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	23.3		1.00	mg/L	10	11/19/20 19:29	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 99 %	Limits: 50-150 %	5 1	11/19/20 19:29	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			102 %	50-150 %	5 1	11/19/20 19:29	NWTPH-Gx (MS)	
MW-4 (A0K0700-11)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 15:52	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 101 %	Limits: 50-150 %	5 1	11/19/20 15:52	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			115 %	50-150 %	5 1	11/19/20 15:52	NWTPH-Gx (MS)	
MW-3 (A0K0700-12)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	ND		0.100	mg/L	1	11/19/20 16:19	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 96 %	Limits: 50-150 %	5 1	11/19/20 16:19	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			113 %	50-150 %	5 1	11/19/20 16:19	NWTPH-Gx (MS)	
MW-6 (A0K0700-13)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	12.5		2.00	mg/L	20	11/19/20 19:56	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recover	y: 100 %	Limits: 50-150 %	5 1	11/19/20 19:56	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			104 %	50-150 %	5 1	11/19/20 19:56	NWTPH-Gx (MS)	
MW-6 Dup (A0K0700-14)				Matrix: Wate	er	Batch	: 0110686	
Gasoline Range Organics	13.7		2.00	mg/L	20	11/19/20 20:50	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		Recove	ry: 96 %	Limits: 50-150 %	5 1	11/19/20 20:50	NWTPH-Gx (MS)	
1,4-Difluorobenzene (Sur)			101 %	50-150 %	5 1	11/19/20 20:50	NWTPH-Gx (MS)	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Selec	ted Volatile Org	ganic Con	pounds by EPA	4 8260D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-5 (A0K0700-01)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		4.00	ug/L	20	11/19/20 18:35	EPA 8260D	
Toluene	ND		20.0	ug/L	20	11/19/20 18:35	EPA 8260D	
Ethylbenzene	206		10.0	ug/L	20	11/19/20 18:35	EPA 8260D	
Xylenes, total	1050		30.0	ug/L	20	11/19/20 18:35	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20	11/19/20 18:35	EPA 8260D	
Naphthalene	1420		80.0	ug/L	20	11/19/20 18:35	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recover	v: 111 %	Limits: 80-120 %	1	11/19/20 18:35	EPA 8260D	
Toluene-d8 (Surr)			104 %	80-120 %	1	11/19/20 18:35	EPA 8260D	
4-Bromofluorobenzene (Surr)			88 %	80-120 %	1	11/19/20 18:35	EPA 8260D	
MW-5D (A0K0700-02)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 12:15	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 12:15	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 12:15	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 12:15	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 12:15	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 12:15	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 108 %	Limits: 80-120 %	1	11/19/20 12:15	EPA 8260D	
Toluene-d8 (Surr)			101 %	80-120 %	1	11/19/20 12:15	EPA 8260D	
4-Bromofluorobenzene (Surr)			94 %	80-120 %	1	11/19/20 12:15	EPA 8260D	
MW-8 (A0K0700-03)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 12:42	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 12:42	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 12:42	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 12:42	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 12:42	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 12:42	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 109 %	Limits: 80-120 %	1	11/19/20 12:42	EPA 8260D	
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 12:42	EPA 8260D	
4-Bromofluorobenzene (Surr)			94 %	80-120 %	1	11/19/20 12:42	EPA 8260D	
MW-8D (A0K0700-04)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 13:10	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 13:10	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 13:10	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 13:10	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Selected Volatile Organic Compounds by EPA 8260D										
	Sample	Detection	Reporting			Date					
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes			
MW-8D (A0K0700-04)				Matrix: Wate	r	Batch:	0110686				
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 13:10	EPA 8260D				
Naphthalene	ND		4.00	ug/L	1	11/19/20 13:10	EPA 8260D				
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 109 %	Limits: 80-120 %	1	11/19/20 13:10	EPA 8260D				
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 13:10	EPA 8260D				
4-Bromofluorobenzene (Surr)			96 %	80-120 %	1	11/19/20 13:10	EPA 8260D				
MW-9 (A0K0700-05)				Matrix: Wate	r	Batch:	0110686				
Benzene	ND		0.200	ug/L	1	11/19/20 13:37	EPA 8260D				
Toluene	ND		1.00	ug/L	1	11/19/20 13:37	EPA 8260D				
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 13:37	EPA 8260D				
Xylenes, total	ND		1.50	ug/L	1	11/19/20 13:37	EPA 8260D				
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 13:37	EPA 8260D				
Naphthalene	ND		4.00	ug/L	1	11/19/20 13:37	EPA 8260D				
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 111 %	Limits: 80-120 %	1	11/19/20 13:37	EPA 8260D				
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 13:37	EPA 8260D				
4-Bromofluorobenzene (Surr)			95 %	80-120 %	1	11/19/20 13:37	EPA 8260D				
MW-7 (A0K0700-06)				Matrix: Wate	r	Batch:	0110686				
Benzene	ND		0.200	ug/L	1	11/19/20 14:04	EPA 8260D				
Toluene	ND		1.00	ug/L	1	11/19/20 14:04	EPA 8260D				
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 14:04	EPA 8260D				
Xylenes, total	ND		1.50	ug/L	1	11/19/20 14:04	EPA 8260D				
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 14:04	EPA 8260D				
Naphthalene	ND		4.00	ug/L	1	11/19/20 14:04	EPA 8260D				
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	v: 111 %	Limits: 80-120 %	1	11/19/20 14:04	EPA 8260D				
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 14:04	EPA 8260D				
4-Bromofluorobenzene (Surr)			95 %	80-120 %	1	11/19/20 14:04	EPA 8260D				
MW-10 (A0K0700-07)				Matrix: Wate	r	Batch:	0110686				
Benzene	ND		0.200	ug/L	1	11/19/20 14:31	EPA 8260D				
Toluene	ND		1.00	ug/L	1	11/19/20 14:31	EPA 8260D				
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 14:31	EPA 8260D				
Xylenes, total	ND		1.50	ug/L	1	11/19/20 14:31	EPA 8260D				
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 14:31	EPA 8260D				
Naphthalene	ND		4.00	ug/L	1	11/19/20 14:31	EPA 8260D				
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 112 %	Limits: 80-120 %	1	11/19/20 14:31	EPA 8260D				
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 14:31	EPA 8260D				

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Select	ed Volatile Org	anic Con	pounds by EPA	8260D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-10 (A0K0700-07)				Matrix: Wate	r	Batch:	0110686	
Surrogate: 4-Bromofluorobenzene (Surr)		Recovery	y: 95 %	Limits: 80-120 %	1	11/19/20 14:31	EPA 8260D	
MW-2 (A0K0700-08)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 14:58	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 14:58	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 14:58	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 14:58	EPA 8260D	
Methyl tert-butyl ether (MTBE)	2.43		1.00	ug/L	1	11/19/20 14:58	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 14:58	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	105 %	Limits: 80-120 %	1	11/19/20 14:58	EPA 8260D	
Toluene-d8 (Surr)		Ť	104 %	80-120 %	1	11/19/20 14:58	EPA 8260D	
4-Bromofluorobenzene (Surr)			94 %	80-120 %	1	11/19/20 14:58	EPA 8260D	
MW-1 (A0K0700-09)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 15:25	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 15:25	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 15:25	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 15:25	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 15:25	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 15:25	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	109 %	Limits: 80-120 %	1	11/19/20 15:25	EPA 8260D	
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 15:25	EPA 8260D	
4-Bromofluorobenzene (Surr)			93 %	80-120 %	1	11/19/20 15:25	EPA 8260D	
MW-11 (A0K0700-10)				Matrix: Wate	r	Batch:	0110686	
Benzene	35.9		2.00	ug/L	10	11/19/20 19:29	EPA 8260D	
Toluene	70.5		10.0	ug/L	10	11/19/20 19:29	EPA 8260D	
Xylenes, total	3310		15.0	ug/L	10	11/19/20 19:29	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		10.0	ug/L	10	11/19/20 19:29	EPA 8260D	
Naphthalene	207		40.0	ug/L	10	11/19/20 19:29	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	101 %	Limits: 80-120 %	1	11/19/20 19:29	EPA 8260D	
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 19:29	EPA 8260D	
4-Bromofluorobenzene (Surr)			92 %	80-120 %	1	11/19/20 19:29	EPA 8260D	
MW-11 (A0K0700-10RE1)				Matrix: Wate	r	Batch:	0110747	
Ethylbenzene	2180		50.0	ug/L	100	11/20/20 21:58	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery:	100 %	Limits: 80-120 %	1	11/20/20 21:58	EPA 8260D	

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Goas Smerighini





6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001

Portland, OR 97239 Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	36160	ed Volatile Oig	jariic Coll	pounds by EPA	1 0200D			
	Sample	Detection	Reporting			Date		
Analyte	Result	Limit	Limit	Units	Dilution	Analyzed	Method Ref.	Notes
MW-11 (A0K0700-10RE1)				Matrix: Wate	r	Batch:	0110747	
Surrogate: Toluene-d8 (Surr)		Recovery	: 105 %	Limits: 80-120 %	1	11/20/20 21:58	EPA 8260D	
4-Bromofluorobenzene (Surr)			98 %	80-120 %	1	11/20/20 21:58	EPA 8260D	
MW-4 (A0K0700-11)				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 15:52	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 15:52	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 15:52	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 15:52	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 15:52	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 15:52	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 113 %	Limits: 80-120 %	1	11/19/20 15:52	EPA 8260D	
Toluene-d8 (Surr)			103 %	80-120 %	1	11/19/20 15:52	EPA 8260D	
4-Bromofluorobenzene (Surr)			95 %	80-120 %	1	11/19/20 15:52	EPA 8260D	
				Matrix: Wate	r	Batch:	0110686	
Benzene	ND		0.200	ug/L	1	11/19/20 16:19	EPA 8260D	
Toluene	ND		1.00	ug/L	1	11/19/20 16:19	EPA 8260D	
Ethylbenzene	ND		0.500	ug/L	1	11/19/20 16:19	EPA 8260D	
Xylenes, total	ND		1.50	ug/L	1	11/19/20 16:19	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1	11/19/20 16:19	EPA 8260D	
Naphthalene	ND		4.00	ug/L	1	11/19/20 16:19	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	y: 111 %	Limits: 80-120 %	1	11/19/20 16:19	EPA 8260D	
Toluene-d8 (Surr)			104 %	80-120 %	1	11/19/20 16:19	EPA 8260D	
4-Bromofluorobenzene (Surr)			94 %	80-120 %	1	11/19/20 16:19	EPA 8260D	
лw-6 (A0K0700-13)				Matrix: Wate	r	Batch:	0110686	
Benzene	149		4.00	ug/L	20	11/19/20 19:56	EPA 8260D	
Toluene	24.8		20.0	ug/L	20	11/19/20 19:56	EPA 8260D	
Ethylbenzene	1850		10.0	ug/L	20	11/19/20 19:56	EPA 8260D	
Xylenes, total	207		30.0	ug/L	20	11/19/20 19:56	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20	11/19/20 19:56	EPA 8260D	
Naphthalene	279		80.0	ug/L	20	11/19/20 19:56	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recovery	: 103 %	Limits: 80-120 %	1	11/19/20 19:56	EPA 8260D	
Toluene-d8 (Surr)			102 %	80-120 %	1	11/19/20 19:56	EPA 8260D	
4-Bromofluorobenzene (Surr)			96 %	80-120 %	1	11/19/20 19:56	EPA 8260D	
//W-6 Dup (A0K0700-14)				Matrix: Wate	r	Batch:	0110686	

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Jose & Jamenghini





ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

ANALYTICAL SAMPLE RESULTS

	Select	ted Volatile O	rganic Con	pounds by EPA	4 8260D			
Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
MW-6 Dup (A0K0700-14)				Matrix: Wate	er	Batch:		
Benzene	163		4.00	ug/L	20	11/19/20 20:50	EPA 8260D	
Toluene	30.2		20.0	ug/L	20	11/19/20 20:50	EPA 8260D	
Ethylbenzene	2080		10.0	ug/L	20	11/19/20 20:50	EPA 8260D	
Xylenes, total	398		30.0	ug/L	20	11/19/20 20:50	EPA 8260D	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20	11/19/20 20:50	EPA 8260D	
Naphthalene	315		80.0	ug/L	20	11/19/20 20:50	EPA 8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		Recove	ery: 102 %	Limits: 80-120 %	5 1	11/19/20 20:50	EPA 8260D	
Toluene-d8 (Surr)			101 %	80-120 %	5 1	11/19/20 20:50	EPA 8260D	
4-Bromofluorobenzene (Surr)			94 %	80-120 %	5 1	11/19/20 20:50	EPA 8260D	

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239

F

Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbon	s by NWT	PH-Dx						
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Not	es
Batch 0110768 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0110768-BLK1)		Prepared	: 11/20/20 12:	42 Analyz	ed: 11/20/20	22:28							
NWTPH-Dx LL													
Diesel	ND		0.0727	mg/L	1								
Oil	ND		0.145	mg/L	1								
Surr: o-Terphenyl (Surr)		Reco	very: 101 %	Limits: 50	1-150 %	Dilı	ıtion: 1x						
LCS (0110768-BS1)		Prepared	: 11/20/20 12:	42 Analyz	ed: 11/20/20	22:50							
NWTPH-Dx LL													
Diesel	0.439		0.0800	mg/L	1	0.500		88	59 - 115%				
Surr: o-Terphenyl (Surr)		Reco	very: 106 %	Limits: 50	1-150 %	Dilı	ution: 1x						
LCS Dup (0110768-BSD1)		Prepared	: 11/20/20 12:	42 Analyz	ed: 11/20/20	23:11							Q-1
NWTPH-Dx LL													
Diesel	0.459		0.0800	mg/L	1	0.500		92	59 - 115%	4	30%		
Surr: o-Terphenyl (Surr)		Reco	very: 108 %	Limits: 50	1-150 %	Dilı	ıtion: 1x						
Batch 0110834 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er					
Blank (0110834-BLK1)		Prepared	: 11/23/20 11:	50 Analyz	ed: 11/23/20	22:19							
NWTPH-Dx LL													
Diesel	ND		0.0727	mg/L	1								
Oil	ND		0.145	mg/L	1								
Oil Surr: o-Terphenyl (Surr)	ND		0.145 very: 110 %	mg/L Limits: 50		Dili	ution: Ix					Q-41	
	ND	Reco		Limits: 50	1-150 %		tion: Ix					Q-41	
Surr: o-Terphenyl (Surr)	ND	Reco	very: 110 %	Limits: 50	1-150 %		 ution: 1x					Q-41	
Surr: o-Terphenyl (Surr) LCS (0110834-BS1)	ND 0.426	Reco	very: 110 %	Limits: 50	1-150 %		ttion: Ix	85	59 - 115%			Q-41	
LCS (0110834-BS1) NWTPH-Dx LL		Reco	very: 110 %:: 11/23/20 11::	Limits: 50	ed: 11/23/20	0.500		85				Q-41 Q-41	
Surr: o-Terphenyl (Surr) LCS (0110834-BS1) NWTPH-Dx LL Diesel		Prepared	very: 110 % : 11/23/20 11: 0.0800	Limits: 50 50 Analyz mg/L Limits: 50	ed: 11/23/20 1 1-150 %	0.500 Dilu		85					Q-1
Surr: o-Terphenyl (Surr) LCS (0110834-BS1) NWTPH-Dx LL Diesel Surr: o-Terphenyl (Surr)		Prepared	very: 110 % : 11/23/20 11: 0.0800 very: 111 %	Limits: 50 50 Analyz mg/L Limits: 50	ed: 11/23/20 1 1-150 %	0.500 Dilu		85					Q-1
Surr: o-Terphenyl (Surr) LCS (0110834-BS1) NWTPH-Dx LL Diesel Surr: o-Terphenyl (Surr) LCS Dup (0110834-BSD1)		Prepared	very: 110 % : 11/23/20 11: 0.0800 very: 111 %	Limits: 50 50 Analyz mg/L Limits: 50	ed: 11/23/20 1 1-150 %	0.500 Dilu					30%		Q-1

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbor	s by NW	ГРН-Dx					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0111007 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er				
Blank (0111007-BLK1)		Prepared	: 11/30/20 12:4	14 Analyz	ed: 12/01/2	0 01:33						
NWTPH-Dx LL												
Diesel	ND		0.0727	mg/L	1							
Oil	ND		0.145	mg/L	1							
Surr: o-Terphenyl (Surr)		Rece	overy: 99 %	Limits: 50	0-150 %	Dilı	ution: 1x					
LCS (0111007-BS1)		Prepared	: 11/30/20 12:4	14 Analyz	ed: 12/01/2	0 01:55						
NWTPH-Dx LL												
Diesel	0.415		0.0800	mg/L	1	0.500		83	59 - 115%			
Surr: o-Terphenyl (Surr)		Reco	very: 105 %	Limits: 50	0-150 %	Dila	ution: 1x					
LCS Dup (0111007-BSD1)		Prepared	: 11/30/20 12:4	14 Analyz	ed: 12/01/2	0 02:17						Q-19
NWTPH-Dx LL												
Diesel	0.433		0.0800	mg/L	1	0.500		87	59 - 115%	4	30%	
Surr: o-Terphenyl (Surr)		Reco	very: 102 %	Limits: 50	0-150 %	Dili	ution: 1x					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

		D	iesel and/o	r Oil Hyd	rocarbon	s by NW1	PH-Dx					
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0120007 - EPA 3510C	(Fuels/Acid	Ext.)					Wat	er				
Blank (0120007-BLK1)		Prepared	: 12/01/20 07::	58 Analyz	ed: 12/01/2	0 22:02						
NWTPH-Dx LL												
Diesel	ND		0.0727	mg/L	1							
Oil	ND		0.145	mg/L	1							
Surr: o-Terphenyl (Surr)		Rece	overy: 99 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
LCS (0120007-BS1)		Prepared	: 12/01/20 07::	58 Analyz	ed: 12/01/2	0 22:24						
NWTPH-Dx LL												
Diesel	0.434		0.0800	mg/L	1	0.500		87	59 - 115%			
Surr: o-Terphenyl (Surr)		Reco	very: 100 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
LCS Dup (0120007-BSD1)		Prepared	: 12/01/20 07::	58 Analyz	ed: 12/01/2	0 22:45						Q-1
NWTPH-Dx LL		1										
Diesel	0.394		0.0800	mg/L	1	0.500		79	59 - 115%	10	30%	
Surr: o-Terphenyl (Surr)		Reco	overy: 99 %	Limits: 50	-150 %	Dilı	ution: 1x					

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ORELAP ID: OR100062

Cascadia Associates
5820 SW Kelly Ave Unit B
Portland, OR 97239

Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

	Gasolir	ne Range I	lydrocarbo	ons (Benz	ene thro	ugh Naph	thalene) l	by NWTP	H-Gx			
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0110686 - EPA 5030B							Wat	er				
Blank (0110686-BLK1)		Prepared	: 11/19/20 10:	:00 Analyz	ed: 11/19/2	0 11:48						
NWTPH-Gx (MS)												
Gasoline Range Organics	ND		0.100	mg/L	1							
Surr: 4-Bromofluorobenzene (Sur)		Rec	overy: 95 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
1,4-Difluorobenzene (Sur)			108 %	50	-150 %		"					
LCS (0110686-BS2)		Prepared	: 11/19/20 10:	:00 Analyz	ed: 11/19/2	0 11:21						
NWTPH-Gx (MS)												
Gasoline Range Organics	0.454		0.100	mg/L	1	0.500		91 8	30 - 120%			
Surr: 4-Bromofluorobenzene (Sur)		Rec	overy: 95 %	Limits: 50	-150 %	Dilı	ıtion: 1x					
1,4-Difluorobenzene (Sur)			102 %	50	-150 %		"					
Duplicate (0110686-DUP1)		Prepared	: 11/19/20 11:	04 Analyz	ed: 11/19/20	0 19:02						
QC Source Sample: MW-5 (A0K)	0700-01)											
NWTPH-Gx (MS)												
Gasoline Range Organics	18.2		2.00	mg/L	20		18.5			2	30%	
Surr: 4-Bromofluorobenzene (Sur)		Rec	overy: 96 %	Limits: 50	-150 %	Dilı	tion: 1x					
1,4-Difluorobenzene (Sur)			108 %	50	-150 %		"					
Duplicate (0110686-DUP2)		Prepared	: 11/19/20 11:	04 Analyz	ed: 11/19/20	0 20:23						
QC Source Sample: MW-6 (A0K)	0700-13)											
NWTPH-Gx (MS)												
Gasoline Range Organics	12.5		2.00	mg/L	20		12.5			0.4	30%	
Surr: 4-Bromofluorobenzene (Sur)		Reco	very: 100 %	Limits: 50	-150 %	Dilı	tion: 1x					
1,4-Difluorobenzene (Sur)			102 %	50	-150 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0110686 - EPA 5030B							Wat	er				
Blank (0110686-BLK1)		Prepared	: 11/19/20 10:	00 Analyz	ed: 11/19/20	0 11:48						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
Toluene	ND		1.00	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		4.00	ug/L	1							
1,2-Dibromoethane (EDB)	ND		0.500	ug/L	1							
1,2-Dichloroethane (EDC)	ND		0.500	ug/L	1							
Isopropylbenzene	ND		1.00	ug/L	1							
1,2,4-Trimethylbenzene	ND		1.00	ug/L	1							
1,3,5-Trimethylbenzene	ND		2.00	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 107 %	Limits: 80	-120 %	Dilu	tion: 1x					
Toluene-d8 (Surr)			102 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			96 %	80	-120 %		"					
LCS (0110686-BS1)		Prepared	: 11/19/20 10:	00 Analyz	ed: 11/19/20	0 10:45						
EPA 8260D												
Benzene	21.8		0.200	ug/L	1	20.0		109	80 - 120%			
Toluene	20.8		1.00	ug/L	1	20.0		104	80 - 120%			
Ethylbenzene	21.8		0.500	ug/L	1	20.0		109	80 - 120%			
Xylenes, total	65.9		1.50	ug/L	1	60.0		110	80 - 120%			
Methyl tert-butyl ether (MTBE)	21.6		1.00	ug/L	1	20.0		108	80 - 120%			
Naphthalene	16.0		4.00	ug/L	1	20.0		80	80 - 120%			
1,2-Dibromoethane (EDB)	21.6		0.500	ug/L	1	20.0		108	80 - 120%			
1,2-Dichloroethane (EDC)	22.0		0.500	ug/L	1	20.0		110	80 - 120%			
Isopropylbenzene	19.1		1.00	ug/L	1	20.0		95	80 - 120%			
1,2,4-Trimethylbenzene	20.2		1.00	ug/L	1	20.0		101	80 - 120%			
,3,5-Trimethylbenzene	20.0		2.00	ug/L	1	20.0		100	80 - 120%			
lurr: 1,4-Difluorobenzene (Surr)		Reco	very: 101 %	Limits: 80	1-120 %		ıtion: 1x					
Toluene-d8 (Surr)		1.000	100 %		-120 %	2110	"					
4-Bromofluorobenzene (Surr)			93 %		-120 %		,,					

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Josa & Zmenighini





ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239

F

Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unas by E	PA 82601	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0110686 - EPA 5030B							Wat	er				
Duplicate (0110686-DUP1)		Prepared	: 11/19/20 11:0	04 Analyz	ed: 11/19/20	0 19:02						
QC Source Sample: MW-5 (A0K0	<u> 0700-01)</u>											
EPA 8260D												
Benzene	ND		4.00	ug/L	20		ND				30%	
Гoluene	ND		20.0	ug/L	20		ND				30%	
Ethylbenzene	209		10.0	ug/L	20		206			2	30%	
Xylenes, total	1050		30.0	ug/L	20		1050			0.5	30%	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20		ND				30%	
Naphthalene	1520		80.0	ug/L	20		1420			7	30%	
1,2-Dibromoethane (EDB)	ND		10.0	ug/L	20		ND				30%	
1,2-Dichloroethane (EDC)	ND		10.0	ug/L	20		ND				30%	
sopropylbenzene	70.2		20.0	ug/L	20		67.2			4	30%	
1,2,4-Trimethylbenzene	322		20.0	ug/L	20		306			5	30%	
1,3,5-Trimethylbenzene	793		40.0	ug/L	20		766			3	30%	
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 108 %	Limits: 80	0-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			103 %	80	0-120 %		"					
4-Bromofluorobenzene (Surr)			91 %	80	0-120 %		"					
Duplicate (0110686-DUP2)		Prepared	: 11/19/20 11:	04 Analyz	ed: 11/19/20	0 20:23						
QC Source Sample: MW-6 (A0K0	0700-13)											
EPA 8260D												
Benzene	151		4.00	ug/L	20		149			1	30%	
Toluene	24.6		20.0	ug/L	20		24.8			0.8	30%	
Ethylbenzene	1810		10.0	ug/L	20		1850			2	30%	
Xylenes, total	196		30.0	ug/L	20		207			6	30%	
Methyl tert-butyl ether (MTBE)	ND		20.0	ug/L	20		ND				30%	
Naphthalene	290		80.0	ug/L	20		279			4	30%	
1,2-Dibromoethane (EDB)	ND		10.0	ug/L	20		ND				30%	
,2-Dichloroethane (EDC)	ND		10.0	ug/L	20		ND				30%	
sopropylbenzene	40.2		20.0	ug/L	20		40.2			0	30%	
1,2,4-Trimethylbenzene	30.0		20.0	ug/L	20		32.4			8	30%	
	ND		40.0	ug/L	20		25.8			***	30%	
1,3,5-Trimethylbenzene	ND											
3,5-Trimethylbenzene Surr: 1,4-Difluorobenzene (Surr)	ND	Reco	very: 102 %	Limits: 80	0-120 %	Dilı	ution: 1x					

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

Selected Volatile Organic Compounds by EPA 8260D											
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD Limit	Notes
Batch 0110686 - EPA 5030B							Wat	er			
Duplicate (0110686-DUP2)		Prepared	: 11/19/20 11:0	04 Analy	zed: 11/19/20	0 20:23					

QC Source Sample: MW-6 (A0K0700-13)

Surr: 4-Bromofluorobenzene (Surr) Recovery: 94 % Limits: 80-120 % Dilution: 1x

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

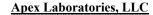
Report ID: A0K0700 - 12 03 20 1148

QUALITY CONTROL (QC) SAMPLE RESULTS

		Sele	cted Volatil	e Organi	c Compo	unds by E	PA 8260I	<u> </u>				
Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 0110747 - EPA 5030B							Wat	er				
Blank (0110747-BLK1)		Prepared	: 11/20/20 09:	30 Analyz	ed: 11/20/20	13:20						
EPA 8260D												
Benzene	ND		0.200	ug/L	1							
Toluene	ND		1.00	ug/L	1							
Ethylbenzene	ND		0.500	ug/L	1							
Xylenes, total	ND		1.50	ug/L	1							
Methyl tert-butyl ether (MTBE)	ND		1.00	ug/L	1							
Naphthalene	ND		2.00	ug/L	1							
1,2-Dibromoethane (EDB)	ND		1.00	ug/L	1							
1,2-Dichloroethane (EDC)	ND		0.500	ug/L	1							
Isopropylbenzene	ND		1.00	ug/L	1							
1,2,4-Trimethylbenzene	ND		1.00	ug/L	1							
1,3,5-Trimethylbenzene	ND		1.00	ug/L	1							
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 100 %	Limits: 80)-120 %	Dilı	ution: 1x					
Toluene-d8 (Surr)			105 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			100 %	80	-120 %		"					
LCS (0110747-BS1)		Prepared	: 11/20/20 09:	30 Analyz	ed: 11/20/20	0 11:32						
EPA 8260D												
Benzene	20.8		0.200	ug/L	1	20.0		104 8	80 - 120%			
Toluene	20.1		1.00	ug/L	1	20.0		101 8	30 - 120%			
Ethylbenzene	20.3		0.500	ug/L	1	20.0		102 8	30 - 120%			
Xylenes, total	61.1		1.50	ug/L	1	60.0		102 8	30 - 120%			
Methyl tert-butyl ether (MTBE)	19.1		1.00	ug/L	1	20.0		95 8	30 - 120%			
Naphthalene	17.9		2.00	ug/L	1	20.0		90 8	30 - 120%			
1,2-Dibromoethane (EDB)	19.5		1.00	ug/L	1	20.0		97 8	30 - 120%			
1,2-Dichloroethane (EDC)	22.3		0.500	ug/L	1	20.0		111 8	30 - 120%			
Isopropylbenzene	20.2		1.00	ug/L	1	20.0		101 8	80 - 120%			
1,2,4-Trimethylbenzene	21.7		1.00	ug/L	1	20.0		108 8	80 - 120%			
1,3,5-Trimethylbenzene	21.1		1.00	ug/L	1	20.0		105 8	80 - 120%			
Surr: 1,4-Difluorobenzene (Surr)		Reco	very: 100 %	Limits: 80	0-120 %	Dilt	ution: 1x					
Toluene-d8 (Surr)			100 %	80	-120 %		"					
4-Bromofluorobenzene (Surr)			93 %	80	-120 %		"					

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ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

SAMPLE PREPARATION INFORMATION

	Diesel and/or Oil Hydrocarbons by NWTPH-Dx						
Prep: EPA 3510C (F	uels/Acid Ext.)	<u>1</u>			Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0110768							
A0K0700-01	Water	NWTPH-Dx LL	11/16/20 09:58	11/20/20 12:42	1060mL/2mL	1000 mL/2 mL	0.94
Batch: 0110834							
A0K0700-02	Water	NWTPH-Dx LL	11/16/20 10:29	11/23/20 11:55	1070mL/2mL	1000mL/2mL	0.94
A0K0700-03	Water	NWTPH-Dx LL	11/16/20 11:02	11/23/20 11:55	1060mL/2mL	1000mL/2mL	0.94
A0K0700-04	Water	NWTPH-Dx LL	11/16/20 11:39	11/23/20 11:55	1070 mL/2 mL	1000 mL/2 mL	0.94
Batch: 0111007							
A0K0700-05	Water	NWTPH-Dx LL	11/16/20 12:24	11/30/20 14:50	1060mL/2mL	1000mL/2mL	0.94
A0K0700-06	Water	NWTPH-Dx LL	11/16/20 13:12	11/30/20 14:50	1070mL/2mL	1000mL/2mL	0.94
A0K0700-07	Water	NWTPH-Dx LL	11/16/20 14:20	11/30/20 14:50	1070 mL/2 mL	1000 mL/2 mL	0.94
Batch: 0120007							
A0K0700-08	Water	NWTPH-Dx LL	11/17/20 08:06	12/01/20 07:58	1060mL/2mL	1000mL/2mL	0.94
A0K0700-09	Water	NWTPH-Dx LL	11/17/20 09:10	12/01/20 07:58	1070mL/2mL	1000mL/2mL	0.94
A0K0700-10	Water	NWTPH-Dx LL	11/17/20 09:54	12/01/20 07:58	1060mL/2mL	1000mL/2mL	0.94
A0K0700-11	Water	NWTPH-Dx LL	11/17/20 10:42	12/01/20 07:58	1060mL/2mL	1000mL/2mL	0.94
A0K0700-12	Water	NWTPH-Dx LL	11/17/20 11:24	12/01/20 12:40	1070 mL/2 mL	1000mL/2mL	0.94
A0K0700-13	Water	NWTPH-Dx LL	11/17/20 12:14	12/01/20 12:40	1040mL/2mL	1000mL/2mL	0.96
A0K0700-14	Water	NWTPH-Dx LL	11/17/20 12:14	12/01/20 12:40	1020 mL/2 mL	1000 mL/2 mL	0.98

	Gas	soline Range Hydrocarb	ons (Benzene thro	ugh Naphthalene) b	y NWTPH-Gx		
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0110686							
A0K0700-01	Water	NWTPH-Gx (MS)	11/16/20 09:58	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-02	Water	NWTPH-Gx (MS)	11/16/20 10:29	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-03	Water	NWTPH-Gx (MS)	11/16/20 11:02	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-04	Water	NWTPH-Gx (MS)	11/16/20 11:39	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-05	Water	NWTPH-Gx (MS)	11/16/20 12:24	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-06	Water	NWTPH-Gx (MS)	11/16/20 13:12	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-07	Water	NWTPH-Gx (MS)	11/16/20 14:20	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-08	Water	NWTPH-Gx (MS)	11/17/20 08:06	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-09	Water	NWTPH-Gx (MS)	11/17/20 09:10	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-10	Water	NWTPH-Gx (MS)	11/17/20 09:54	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-11	Water	NWTPH-Gx (MS)	11/17/20 10:42	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-12	Water	NWTPH-Gx (MS)	11/17/20 11:24	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Portland, OR 97239Project Manager:Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

SAMPLE PREPARATION INFORMATION

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx							
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
A0K0700-13	Water	NWTPH-Gx (MS)	11/17/20 12:14	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-14	Water	NWTPH-Gx (MS)	11/17/20 12:14	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00

		Selected Vol	atile Organic Compo	unds by EPA 8260D			
Prep: EPA 5030B					Sample	Default	RL Prep
Lab Number	Matrix	Method	Sampled	Prepared	Initial/Final	Initial/Final	Factor
Batch: 0110686							
A0K0700-01	Water	EPA 8260D	11/16/20 09:58	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-02	Water	EPA 8260D	11/16/20 10:29	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-03	Water	EPA 8260D	11/16/20 11:02	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-04	Water	EPA 8260D	11/16/20 11:39	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-05	Water	EPA 8260D	11/16/20 12:24	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-06	Water	EPA 8260D	11/16/20 13:12	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-07	Water	EPA 8260D	11/16/20 14:20	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-08	Water	EPA 8260D	11/17/20 08:06	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-09	Water	EPA 8260D	11/17/20 09:10	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-10	Water	EPA 8260D	11/17/20 09:54	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-11	Water	EPA 8260D	11/17/20 10:42	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-12	Water	EPA 8260D	11/17/20 11:24	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-13	Water	EPA 8260D	11/17/20 12:14	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
A0K0700-14	Water	EPA 8260D	11/17/20 12:14	11/19/20 11:04	5mL/5mL	5mL/5mL	1.00
Batch: 0110747							
A0K0700-10RE1	Water	EPA 8260D	11/17/20 09:54	11/20/20 12:11	5mL/5mL	5mL/5mL	1.00

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia Associates Project: **Nustar Vannex** 5820 SW Kelly Ave Unit B Project Number: 0060-001-001 Report ID: Portland, OR 97239 Project Manager: Stephanie Salisbury A0K0700 - 12 03 20 1148

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

F-11	The hydrocarbon pattern indicates possible weathered diesel, mineral oil, or a contribution from a related component.
F-13	The chromatographic pattern does not resemble the fuel standard used for quantitation
F-18	Result for Diesel (Diesel Range Organics, C12-C24) is due to overlap from Gasoline or a Gasoline Range product.
F-20	Result for Diesel is Estimated due to overlap from Gasoline Range Organics or other VOCs.
PRES	Incomplete field preservation. Additional preservative was added to adjust the pH within the appropriate range for this analysis.
Q-19	Blank Spike Duplicate (BSD) sample analyzed in place of Matrix Spike/Duplicate samples due to limited sample amount available for analysis.
Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.

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ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Portland, OR 97239Project Manager:Stephanie SalisburyA6

Report ID: A0K0700 - 12 03 20 1148

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).

If no value is listed ('----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.

The Result Basis is listed following the units as "dry", "wet", or " " (blank) designation.

"dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")

See Percent Solids section for details of dry weight analysis.

"wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

"__" Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

"---" QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).

- -For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
- -For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.

For further details, please request a copy of this document.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

 Cascadia Associates
 Project:
 Nustar Vannex

 5820 SW Kelly Ave Unit B
 Project Number:
 0060-001-001

 Portland, OR 97239
 Project Manager:
 Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold time compliance and field filtration. Data is qualified as necessary, and the lack of qualification indicates compliance with required parameters.

Apex Laboratories

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323

ORELAP ID: OR100062

Cascadia AssociatesProject:Nustar Vannex5820 SW Kelly Ave Unit BProject Number:0060-001-001Report ID:Portland, OR 97239Project Manager:Stephanie SalisburyA0K0700 - 12 03 20 1148

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation) EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the <u>exception</u> of any analyte(s) listed below:

Apex Laboratories

Matrix Analysis TNI_ID Analyte TNI_ID Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.

Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

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Sampled by: J. Walthan	3	$_{\perp}$													Z.	YSIS	ANALYSIS REQUEST	EST							
OR WA CA AK ID SAMPLE ID	LAB ID#	ELAG	TIME	XIATAM	# OF CONTAINERS	имлен-нсп	xd-H4TWN	NWTPH-G*	8700 BEDM AOC8	8700 Halo VOCs	8700 AOCs Euli List	8HA9 MIS 0718	8270 Semi-Vols Full List	8087 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	AL Sb, As, Bs, Be, Cd, Cs, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ml, K, Se, Ag, Us, Tl,	V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	MIGE	Nophhalans	1-01-011-0-0		rehive
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TAT Bonnested (circle)	1 Day		2 Day	3	3 Day						\$	T	36	S	g	Z	3	3	2	1-17	PA	MTBE, Naphthalene by EPA 8260	Q		
(mm)	4 DAY		5 DAY		Other:	er:																			
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Apex Laboratories

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Goas Smerighini





6700 S.W. Sandburg Street Tigard, OR 97223 503-718-2323 ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project: Number: 0060-001-001
Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

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C B										}	}		Y.	1 SIS	ANALYSIS REQUEST			}				
# AII 8 N	TAG-	XIATAM	# OF CONTAINERS	MATPH-HCID	NWTPH-Dx	8760 BTEX	8260 RBDM VOCs	8760 Halo VOCs	8700 AOCs Enii List	\$HV4 WIS 0478	sid llu3 sloV-ima8 0728	8087 bCB ⁸	BCRA Metals (8)	(5) state Witning	Priority Metals (13) Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg,	Al, SD, AS, BR, BC, CB, CB, Mg, Mg, Mg, Mg, Mg, Mg, Mg, Mg, Mg, Mg	TCLP Metals (8)	*537M	*ensladthopala			Archive
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Normal Jum Ar	Normal Jurn Around Time (TAT) = 10 Business Days)=10 Bu	siness D	ays	-	- 1	4		SPE	CIAL	SPECIAL INSTRUCTION		ONS	-] .		-		
1 Day	y 2 Day		3 Day						Z¥	100	// /	3	Z	3	ue b	2	7	4	EPA 826			
TAT Requested (circle) 4 DAY	Y 5 DAY	X	Other:	e:			-		工	I.,	73	Ď.	کے	- 3	H: How Bor Project Myr.	خ						
SAMPLES	SAMPLES ARE HELD FOR 30 DAYS	30 DAYS																				
Date	Date: NA Signat	RECEIVED BY: Signature:	" _ <u>{</u>			Date:	10	3	RELINQUISHED BY: Signature:	INQUI:	CHED	BY:			Ğ	Date:	REC Signa	RECEIVED BY: Signature:	BY:	Date:		
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Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





ORELAP ID: OR100062

<u>Cascadia Associates</u> 5820 SW Kelly Ave Unit B Portland, OR 97239 Project Number: Nustar Vannex

Project Number: 0060-001-001

Project Manager: Stephanie Salisbury

Report ID: A0K0700 - 12 03 20 1148

Chent: (ANCA	adia ASSOCiates Element WO#: A0K0700
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Project/Project #:	UStar Vannex GWM 4020
Delivery Info:	
	20 @ 17.00 By: FAG
Delivered by: ApexC	Client X ESS FedEx UPS Swift Senvoy SDS Other
Cooler Inspection Da	ate/time inspected: 11-17-30 @ 17:00 By: +35
Chain of Custody included	
Signed/dated by client?	Yes No
Signed/dated by Apex?	Yes No
	Cooler #1 Cooler #2 Cooler #3 Cooler #4 Cooler #5 Cooler #6 Cooler #
Temperature (°C)	5.9 5.5 5.4
Received on ice? (Y/N)	
Temp. blanks? (Y/N)	<u>N N N </u>
Ice type: (Gel/Real/Other)	Real Real Real
Condition:	2 good good
Samples Inspection: Da	es form initiated? Yes/No/NA) ate/time inspected: 11-18-28@ 16:40 By: TA-9 X No Comments:
All samples intact: Tes_	7. 10 Comments.
Bottle labels/COCs agree?	? Yes × No Comments: TB# 2473
Donne ladels, e e es agrec.	
COC/container discrepanc	cies form initiated? Yes No
	ved appropriate for analysis? Yes X No Comments:
Do VOA vials have visible	e headspace? Yes No X NA
Do VOA vials have visible	e headspace? Yes No NA
Comments	•
Comments	ed: Yes Y No NA pH appropriate? Yes X No NA
Comments	•
Comments	ed: Yes Y No NA pH appropriate? Yes X No NA
CommentsWater samples: pH checker Comments:	ed: Yes Y No NA pH appropriate? Yes X No NA
CommentsWater samples: pH checker Comments:	ed: Yes Y No NA pH appropriate? Yes X No NA

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